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Students' Responses to the Implementation of the Inquiry-Based Pictorial Riddle Method via Online in the Concept of Fluid Static

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Abstract

The Covid-19 pandemic has led to the issuance of government policies that require distance learning. One approach so that students remain motivated to learn is to use a method that allows two-way interaction between teachers and students even though learning is online. The research was conducted in SMA Negeri 4 Vocational High School, class XI MIA 3, involving 34 students. The research method used was descriptive research which describes students' responses to the implementation of the inquiry-based pictorial riddle method online. The data collection technique used four alternative answers. The research data was processed using the Likert scale. Based on the results of the study, students' responses to the inquiry-based pictorial riddle method were very good. This is evidenced by the response from most students who feel interested and get many benefits when learning to use inquiry-based pictorial riddles during online learning.

Keywords: *students' response; pictorial riddles; inquiry*

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INTRODUCTION

This The pace of development in a country is always pursued in tune with the demands of the times. The development of the times will also always raise new problems in education related to educational service standards, at least based on the Regulation of the Minister of Education and Culture No. 32 of 2018 concerning the leastways of technical standards as a

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strategy to realize compulsory education to the fullest; regarding the types of basic services and the quality of educational services that are entitled obtained by every student and the procedures for fulfilling standard and quality education services with all existing conditions and situations [1,2].

The current Covid-19 pandemic has hit all countries in the world, including Indonesia. As the result, this affects the government's policy regarding social distancing, in which teaching and learning activities cannot be carried out as they should. Therefore, the government implements teaching and learning activities that must be carried out online using learning methods that can motivate students, one of the methods is the inquiry-based pictorial riddle method utilizing several platforms recommended by the Ministry of Education and Culture [3,4].

The inquiry learning model is one of the learning models that can support students to be actively involved in the class's activities and can increase their interest and motivation, as well as can train them to think critically in solving cases [5-8]. Through this, students are required to solve cases given by the teacher through real data resulting from their own observations [9-12]. The inquiry learning model can make it easier for the teachers to carry out the learning process owing to the fact that they are asked to direct the learning activities to be more student-centered.

The pictorial riddle is one visual media form that relies on sight [11]. It is a learning method that is able to develop student activities in small and large group discussions by presenting cases that are packaged in the form of pictures and pictures containing puzzles [13-16]. This research focuses on the concept of static fluid owing to the fact that the concept and its application are often encountered in everyday life so by using the inquiry-based pictorial riddle method the students are expected to be able to understand the concept of static fluid easier. The pictorial riddle method can collaborate with the inquiry learning model due to the fact that both focus on seeking knowledge with their own understanding, especially in learning physics, one of which is static fluid, since physics concepts require pictures to clarify student understanding and can make students become actively involved during the learning process. Students will grasp the concept of static fluid easier with pictures. Previous research using the inquiry-based pictorial riddle method on static fluid material can provide opportunities for students to solve problems given by the teacher through pictures so that students are motivated when learning and produce improved learning outcomes [17].

The followings are the stages of the inquiry-based pictorial riddle learning method: (1) Students make observations based on riddles (pictures); (2) Students conduct group discussions regarding the images that have been displayed; (3) Students combine their arguments and opinions regarding the pictures that have been displayed; (4) Students are invited to solve a given study case in the form of events presented in pictures or puzzles; (5) Students identify the given study case in groups; (6) Students make temporary hypotheses from the formulation of the case; (7) Students conduct experiments and collect data; (8) Students conduct group discussions regarding the experimental results; (9) Students write reports on experimental results; (10) Students present the results of the discussion and conduct questions and answers between groups; (11) Teacher guides the students to make decisions from learning [4,18].

Based on previous research conducted by Prathiwi and Utami, the pictorial riddle obtained a percentage of 72.36% towards the improvement of students' critical thinking [19]. Purwanto and Hasanah found that the pictorial riddle can improve students' critical thinking skills [20]. In addition, Arantika., et al showed that the pictorial riddle had an effect of 29.10% on improving

students' critical thinking outcomes [21]. Then Gultom and Sinuraya in their research showed that the pictorial riddle could improve critical thinking toward students' physics learning outcomes [22]. In addition, previous research conducted by Puspitasari., et al. showed that the use of the pictorial riddle resulted in higher critical thinking skills of students compared to the use of the lecture method [23].

Although the various studies that have been carried out have shown positive results, there is no similar research that discusses the topic of pictorial riddles to improve critical thinking that is carried out online. Therefore, researchers are interested in conducting online research by utilizing Google Classroom as an online learning platform recommended by the Ministry of Education and Culture (Kemendikbud). Accordingly, because of the problems described above, the researcher will conduct a study to determine student responses to the application of the inquiry-based pictorial riddle method online.

METHOD

This research uses descriptive methods. The purpose of this study was to determine student responses to online learning using the inquiry-based pictorial riddle method as an effort to improve the online learning process with more student-centered learning model innovations. The research was conducted on students of class XI MIA 3 at SMA Negeri 4 Kejuruan Muda by involving 34 students, based on suggestions from teachers in the field of study and the school management concerned referring to the abilities of the students. In addition, the research object was chosen based on the consideration of students who have not carried out learning with the inquiry-based pictorial riddle method online. The data collection technique used in this study was the students' response questionnaire to the implementation of the online inquiry-based pictorial riddle method compiled in four alternative answers, namely strongly agree, agree, disagree, and strongly disagree. In analyzing the data, the technique used was to convert the qualitative data to quantitative using the Likert Scale.

To obtain a clear picture of the research, the data analysis using statistical techniques was used with the percentage formula as equation (1) [24]:

$$\mathrm{P} = \frac{f}{n} x\ 100\% \quad (1)$$

Description:
P = Percentage Questionnaire
f = Number of responses that appear
n = The total number of the students
100% = Constant Value

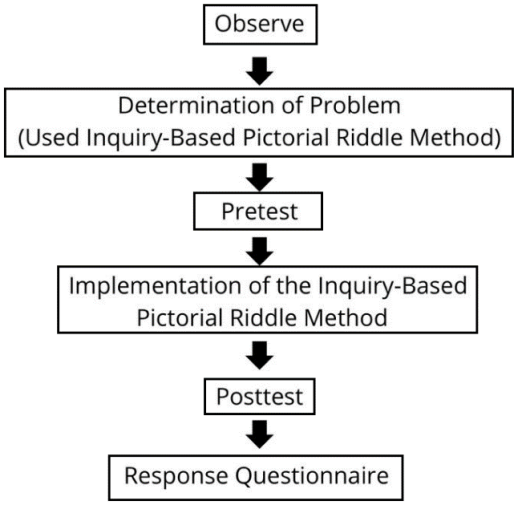

Figure 1. The Research Procedure

RESULTS AND DISCUSSION

Students took the pretest before being given treatment. After being treated using the inquiry-based pictorial riddle method, the researcher gave a posttest. Then, to find out the student's response to the next learning, a questionnaire was given. The students' responses consist of 20 statements covering 4 aspects. During the learning process through the Zoom application, the students are shown pictures containing puzzles and study cases that must be solved. This initial step aims to motivate the students in developing their initial thinking skills to understand the concept of static fluids. During the learning process through pictures provided by the teacher, students are required to understand the concept of hydrostatic pressure and Pascal's law. Pictures that create puzzles in the early learning process can provoke students to develop their motivation and interest as well as their thinking skills [20,25,26].

The images used at the beginning of learning in the study are as Figure 2.

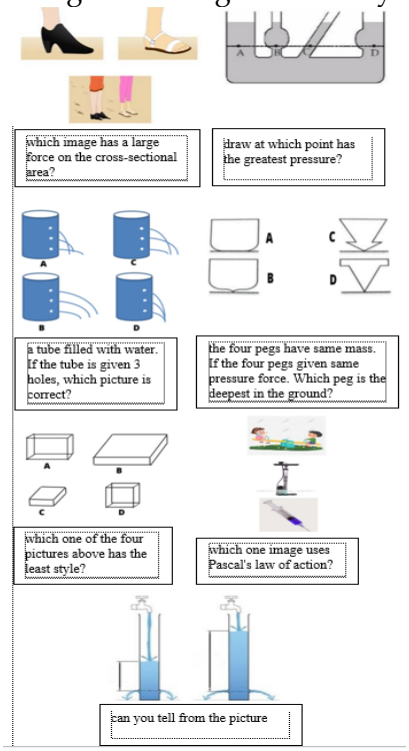

Figure 2. Picture of Pictorial Riddle

Based on the picture, the teacher guided students to formulate existing problems and propose hypotheses, so that students could find their own concepts of hydrostatic pressure and Pascal's law. In this step, the students were required to be active in identifying the case from an image so that they could solve the puzzle. Picture puzzles can arouse students' curiosity about the case given so that students are encouraged to learn more about these cases [4,21,26].

Then to answer the problem and prove the hypothesis, students in groups did a practicum to prove the concept of hydrostatic pressure, namely, the higher a liquid, the greater the pressure generated and the farther the shower distance [3,18,27]. Furthermore, a practicum was also carried out to prove the concept of Pascal's law: when applying pressure to a liquid (the water used in the practicum), water showers occur at all points. This is in accordance with the principle of Pascal's law, which occurs because of the pressure applied and then transmitted in all directions.

After doing the practicum, the students presented their findings and were finally able to conclude. This is what caused the students to not easily forget the concepts they have understood as they find their own concepts from the Static Fluid material through the pictures given. Providing cases in the form of pictorial puzzles is able to stimulate students to think critically and it becomes easier to understand the concepts of the material being taught as they are directly involved in learning activities [19,28-30].

Pictures as visual media certainly helped the students understand the material, express opinions, and exchange information. Pictures can increase students' interest and attention in learning and develop student activities in discussing, building their own knowledge, expressing opinions, as well as exchanging information with each other [18,31,32]. This is proven through questionnaires that were given after implementing the inquiry-based pictorial riddle learning method. The Table 1 shows the results of student responses to online inquiry-based pictorial riddle learning.

Table 1. Student Responses to Online Inquiry-Based Pictorial Riddle Learning

Aspect	No. of Statement	Percentage (%)
Interest	1,3,12,15	90.4%
Benefit	2,4,7,8,9,11,13,14,16,17,18	95.4%
Constraint	5,6,10,19	38.9%
Novelty	20	35.3%

Based on the results of the data analysis above, the student's responses to the learning process by implementing the online inquiry-based pictorial riddle method were remarkable. The students responded that the pictures provided during the online class made the learning more interesting so that students became enthusiastic and did not get bored of learning, also students wanted physics learning materials to be taught using illustrations. Learning using illustrations is proven to increase interest and motivate students to be more interested and enthusiastic about learning [33-35].

In addition, the student's responses to the inquiry-based pictorial riddle method were also very positive. This positive response shows that the students benefit a lot from the pictures presented during the learning process, which could make students' thinking skills more developed, e.g. in expressing opinions, asking and answering questions, providing the right reasons when faced with several answers choices, making it easier for students to make conclusions and to solve problems, easier to understand the concepts of the topic, such as understanding the concept of the main law of hydrostatics, all points located in a flat plane in a

fluid will have the same pressure. This became easier to understand when students were given illustrations by linking concepts [19,29,31].

Inquiry-based pictorial riddle learning has many benefits, namely, students ask each other questions and become actively involved during the learning process [23,36]. However, when online learning takes place, students experience issues with the network's signal and data connection, as a lot of data would be drained and sometimes the signal became unstable. Carrying out the online learning process using the Zoom application might occur several obstacles, such as unstable signals and wasteful use of data [37].

Furthermore, the implementation of picture illustrations to present study cases in online learning is not a strange novel thing for students, as previously it has been applied to other subjects and become a common thing used. Pictures are the most commonly used media in education and have become a common language that is easy to understand [31,22,38].

Based on the results of student responses, it can be said that the inquiry-based pictorial riddle method online can improve online learning more interesting, and make students' thinking skills develop in the concept of static fluid. So that through the use of images in this research model, students are expected to be able to develop their abilities to improve their critical thinking skills [39-41]. This is in accordance with research by Vieira et al. who said that the results of data analysis on survey questionnaires showed that students were satisfied with the implementation of inquiry-based learning during practicum [42]. Similarly, Owolade showed that inquiry learning places an advantage on students' ability to think like a scientist and a mode of instruction that makes students learn concepts and problems, investigate and question them freely [6,21].

The limitation of this research is that it has not used in-depth interview techniques with students to find out more about the implementation of the online inquiry-based pictorial riddle method. In addition, it was only applied to one class, so the results of the study were not fully described.

The inquiry-based pictorial riddle method can motivate students during online learning, especially in physics subject matter [15,23]. This is to make it easier for students to understand physics concepts through pictures [20].

CONCLUSION

Based on the results of the study, all statements in student questionnaires on learning with the online inquiry-based pictorial riddle method on the static fluid concept have a positive influence on the learning process. This is evidenced by the response from most students who feel interested and get many benefits when learning to use inquiry-based pictorial riddles during online learning. Several online platforms can be used in various online learning activities to attract student interest and further improve student skills and learning efficiency. The method used needs to be redesigned and studied further so that it can be applied to various types of material, especially in physics subjects.

AUTHOR CONTRIBUTIONS

Muhammad Syukri: Conceptualization, Methodology, Software, Supervision, and Funding Acquisition; Wardatul Husna: Investigation, Writing – Original Draft, and Project Administration; Ngadimin: Methodology, Data Curation, Software and Visualization; Ayu Andriani: Validation and Resources; Lilia Halim: Writing – Review & Editing and Supervision.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

[1] Juliya M and Herlambang YT. Analisis Problematika Pembelajaran Daring dan Pengaruhnya terhadap Motivasi Belajar Siswa. *Genta Mulia: Jurnal Ilmiah Pendidikan.* 2021; **12**(1): 281-294.
Available from: https://ejournal.stkipbbm.ac.id/index.php/gm/article/view/585.

[2] Umaroh, I. *Problematika Pembelajaran Daring Masa Pandemi Covid-19 Mata Pelajaran Pendidikan Agama Islam (PAI) bagi Peserta Didik di SMP Negeri 23 Surabaya*. Undergraduate Thesis. Surabaya: UIN Sunan Ampel Surabaya; 2021. Available from: http://digilib.uinsby.ac.id/47188/.

[3] Dewi TAP and Sadjiarto A. Pelaksanaan Pembelajaran Daring pada Masa Pandemi Covid-19. *Jurnal Basicedu*. 2021; **5**(4): 1909-1917. DOI: https://doi.org/10.31004/basicedu.v5i4.1094.

[4] Sutriyanti E, Panjaitan RL, and Sudin A. Pengaruh Metode Pembelajaran *Pictorial Riddle* Terhadap Keterampilan Berpikir Kritis Siswa SD pada Materi Pelestarian Lingkungan. *Jurnal Pena Ilmiah*. 2017; **2**(1): 331-340. Available from: https://ejournal.upi.edu/index.php/penailmiah/article/view/10668.

[5] Arifin L and Sunarti T. The Improvement of Students' Scientific Literacy Through Guided Inquiry Learning Model on Fluid Dynamics Topic. *Jurnal Penelitian Fisika dan Aplikasinya.* 2017; **7**(2): 68-78. DOI: https://doi.org/10.26740/jpfa.v7n2.p68-78.

[6] Owolade AO, Oladipupo PO, Kareem AO and Salami MO. Effectiveness of Guided and Open Inquiry Instructional Strategies on Science Process Skills and Self-Efficacy of Biology Students in Osun State, Nigeria. *African Journal of Teacher Education*. 2022; **11**(1): 56-74. DOI: https://doi.org/10.21083/ajote.v11i1.7014.

[7] Sakdiah, Mursal, and Syukri M. Penerapan Model Inkuiri Terbimbing untuk Meningkatkan Pemahaman Konsep dan KPS pada Materi Listrik Dinamis Siswa SMP. *JIPI: Jurnal IPA dan Pembelajaran IPA*. 2018; **2**(1): 41-49. DOI: https://doi.org/10.24815/jipi.v2i1.10727.

[8] Sutama IN, Arnyana IBP, and Swasta, IBJ. Pengaruh Model Pembelajaran Inkuiri terhadap Keterampilan Berpikir Kritis dan Kinerja Ilmiah pada Pelajaran Biologi Kelas XI IPA SMA Negeri 2 Amlapura. *Jurnal Pendidikan IPA Ganesha.* 2014; **4**(1): 1091. Available from: https://ejournal-pasca.undiksha.ac.id/index.php/jurnal_ipa/article/view/1091.

[9] Febriana M, Asy'ari HAA, Subali B, and Rusilowati A. Penerapan Model Pembelajaran *Inquiry Pictorial Riddle* untuk Meningkatkan Keaktifan Siswa. *Jurnal Pendidikan Fisika dan Keilmuan*. 2018; **4**(1): 4-12. DOI: http://doi.org/10.25273/jpfk.v4i1.1879.

[10] Jufrida J, Kurniawan DA, Tanti T, Sukarni W, Erika E, Hoyi R, and Ikhlas M. Description of Student Responses to The Implementation of the Inquiry Learning Model in Physics. *Jurnal Penelitian Fisika dan Aplikasinya.* 2021; **11**(1): 16-28. DOI: https://doi.org/10.26740/jpfa.v11n1.p16-28.

[11] Purwita TD, Sari LP, and Wilujeng I. Utilizing of TTW (Think-Talk-Write) Instructional Model in the Use of Pictorial Riddle-Aided Student Worksheets for Students' Critical Thinking Skills Enhancement. *Journal of Physics: Conference Series*. 2020; **1440**: 012046. DOI: https://doi.org/10.1088/1742-6596/1440/1/012046.

[12] Yasin M, Jauhariyah D, Madiyo M, Rahmawati R, Farid F, Irwandani I, and Mardana FF.

The Guided Inquiry to Improve Students Mathematical Critical Thinking Skills Using Student's Worksheet. *Journal for the Education of Gifted Young Scientist.* 2019; **7**(4): 1345-1360. DOI: https://doi.org/10.17478/jegys.598422.

[13] Qomariya Y, Muharrami LK, Hadi WP, and Rosidi I. Profil Kemampuan Berpikir Analisis Siswa SMP Negeri 3 Bangkalan dengan Menggunakan Metode *Pictorial Riddle* dalam Pembelajaran Inkuiri Terbimbing. *Natural Science Education Research*. 2018; **1**(1): 9-18. DOI: https://doi.org/10.21107/nser.v1i1.4172.

[14] Rizkiah AW, Nasir, and Komarudin. LKPD *Discussion Activity* Terintegrasi Keislaman dengan Pendekatan Pictorial Riddle pada Materi Pecahan. *Desimal: Jurnal Matematika.* 2018; **1**(1): 39-47. DOI: https://doi.org/10.24042/djm.v1i1.1926.

[15] Setiawan AH. Pengaruh Pembelajaran Model Inkuiri Terbimbing dengan Metode *Pictorial Riddle* terhadap Hasil Belajar Siswa. *IPF: Inovasi Pendidikan Fisika*. 2020; **9**(1): 26-30. Available from: https://ejournal.unesa.ac.id/index.php/inovasi-pendidikan-fisika/article/view/31651.

[16] Zarisa A and Saminan. Penerapan Pembelajaran Inkuiri Menggunakan Metode *Pictorial Riddle* Pada Materi Alat-Alat Optik untuk Meningkatkan Kreativitas dan Hasil Belajar Siswa. *Jurnal Pendidikan Sains Indonesia.* 2017; **5**(1): 1-4. Available from: https://jurnal.unsyiah.ac.id/JPSI/article/view/8399.

[17] Dewi PS, Suyatna A, and Maharta N. Perbandingan Hasil Belajar Model Pembelajaran Arias dengan Inkuiri Ilmiah Teknik *Pictorial Riddle. Jurnal Pembelajaran Fisika.* 2013; **1**(1): 106-115. Available from: http://jurnal.fkip.unila.ac.id/index.php/JPF/article/view/695.

[18] Awal S, Yani A, and Amin BD. Peranan Metode *Pictorial Riddle* terhadap Penguasaan Konsep Fisika pada Siswa SMAN 1 Bontonompo. *Jurnal Pendidikan Fisika*. 2016; **4**(2): 249-265. Available from: https://journal.unismuh.ac.id/index.php/jpf/article/view/314.

[19] Prathiwi A and Utami L. Analisis Kemampuan Berpikir Kritis Siswa Menengah Atas Menggunakan Model *Inquiry Pictorial Riddle*. *Journal of The Indonesian Society of Integrated Chemistry*. 2019; **11**(2): 65-71. DOI: https://doi.org/10.22437/jisic.v11i2.7569.

[20] Purwanto J and Hasanah BU. Efektivitas Model Pembelajaran Inkuiri Tipe *Pictorial Riddle* dengan Konten Integrasi-Interkoneksi pada Materi Suhu dan Kalor terhadap Kemampuan Berpikir Kritis Siswa SMA. *Jurnal Kaunia*. 2014; **10**(2): 117-127. Available from: http://ejournal.uin-suka.ac.id/saintek/kaunia/article/view/1072.

[21] Arantika J, Sahputra R, and Sartika RP. Pengaruh Inkuiri Berbantuan *Pictorial Riddle* terhadap Kemampuan Berpikir Kritis pada Materi Koloid di SMA. *Jurnal Pendidikan dan Pembelajaran Khatulistiwa*. 2014; **3**(10): 3-10. Available from: https://jurnal.untan.ac.id/index.php/jpdpb/article/view/7532.

[22] Gultom M and Sinuraya J. Pengaruh Model Pembelajaran Inkuiri Berbasis *Pictorial Riddle* dan Berpikir Kritis terhadap Hasil Belajar Fisika SMAN 17 Medan TP 2015/2016. *INPAFI: Inovasi Pembelajaran Fisika*. 2016; **4**(3): 2-9. DOI: https://doi.org/10.24114/inpafi.v4i3.5603.

[23] Puspitasari D, Santoso S, and Karyanto P. Pengaruh Model Pembelajaran Inkuiri *Pictorial Riddle* untuk Meningkatkan Kemampuan Berpikir Kritis pada Materi Pengetahuan Dasar Pemetaan. *Prosiding Seminar Nasional Geotik 2017*. Surakarta: Universitas Muhammadiyah Surakarta. 2017; 83-92.
Available from: https://publikasiilmiah.ums.ac.id/handle/11617/9084.

[24] Sudijono A. *Pengantar Statistik Pendidikan.* Jakarta: Raja Grafindo Persada; 2009.

[25] Imelda I, Jamal MA, and Suyidno S. Pengembangan Perangkat Pembelajaran IPA Fisika

melalui Model Pembelajaran Inkuiri dengan Metode *Pictorial Riddle*. *Berkala Ilmiah Pendidikan Fisika.* 2013; **1**(1): 31-39. DOI: http://dx.doi.org/10.20527/bipf.v1i1.855.

[26] Lukma HN. Pembelajaran Fisika dengan Inkuiri Terbimbing Menggunakan Animasi dan *Pictorial Riddle* Ditinjau dari Motivasi Belajar dan Sikap Ilmiah Siswa. *Jurnal Qua Teknika*. 2017; **7**(1): 21-29. DOI: https://doi.org/10.35457/quateknika.v7i1.214.

[27] Chusni MM. Penerapan Pendekatan Inkuiri Terbimbing dengan Metode *Pictorial Riddle* untuk Meningkatkan Pemahaman Konsep Fisika Siswa. *Jurnal Pendidikan Fisika.* 2016; **4**(2): 111-123. Available from: https://ojs.fkip.ummetro.ac.id/index.php/fisika/article/view/540.

[28] Arif S and Asikhin FN. Efektivitas Model Pembelajaran *Guided Inquiry* Berbantuan Metode *Pictorial Riddle* terhadap Kemampuan Berpikir Kritis Peserta Didik. *Jurnal Pendidikan MIPA*. 2022; **12**(3): 936-944. DOI: https://doi.org/10.37630/jpm.v12i3.709.

[29] Dewi DAD, Bektiarso S, and Subiki S. Pengaruh Model Pembelajaran *Problem Based Instruction* disertai Metode *Pictorial Riddle* terhadap Hasil Belajar dan Kemampuan Berpikir Kritis Siswa pada Mata Pelajaran Fisika di SMA. *Jurnal Pembelajaran Fisika*. 2017; **6**(1): 48-55. Available from: http://jurnal.unej.ac.id/index.php/JPF/article/view/4652.

[30] Sari Y and Kustijono R. Keefektifan Metode *Pictorial Riddle* untuk Melatihkan Keterampilan Berpikir Kritis. *Prosiding Seminar Nasional Fisika (SNF).* 2018; **2**: 43-48. Available from: https://fisika.fmipa.unesa.ac.id/proceedings/index.php/snf/article/view/62.

[31] Embun S and Astuti M. Pengaruh Penggunaan Media Gambar terhadap Aktivitas Belajar Siswa pada Mata Pelajaran IPA Materi Bumi dan Cuaca di Madrasah Ibtidaiyah Najahiyah Palembang. *Jurnal Ilmiah PGMI.* 2015; **1**(1): 81-106. DOI: https://doi.org/10.19109/jip.v1i1.518.

[32] Qayyimah U, Ahied M, Qomaria N, and Munawaroh F. Pengaruh Metode *Pictorial Riddle* Berbantuan *Powerpoint* untuk Meningkatkan Hasil Belajar Siswa. *Natural Science Education Research.* 2019; **2**(1): 68-76. DOI: https://doi.org/10.21107/nser.v2i1.5595.

[33] Adharica A, Fanani A, and Prastyo D. Pengaruh Model Pembelajaran Inkuiri Tipe *Pictorial Riddle* terhadap Hasil Belajar Siswa Kelas V SDN Belahantengah Mojosari. *Jurnal Buana Pendidikan*. 2020; **16**(30): 33-40. DOI: https://doi.org/10.36456/bp.vol16.no30s.a2754.

[34] Mahardika IK, Indrawati, and Supeno. Media *Pictorial Riddle* Berbasis Pendekatan Inkuiri untuk Meningkatkan Keterampilan Berpikir Kritis Siswa SMA. *Prosiding Webinar Pendidikan Fisika.* 2020; **5**(1): 6-10. Available from: https://jurnal.unej.ac.id/index.php/fkip-epro/article/view/21684.

[35] Resta IL, Fauzi A, and Yulkifli. Pengaruh Pendekatan *Pictorial Riddle* Jenis Video terhadap Hasil Belajar Siswa dalam Pembelajaran Inkuiri pada Materi Gelombang Terintegrasi Bencana Tsunami. *Jurnal Berkala Ilmiah Pendidikan Fisika.* 2013; **1**: 17-22. Available from: http://ejournal.unp.ac.id/students/index.php/pfis/article/view/401.

[36] Setyawan P and Ibrahim M. Pengembangan Media Flashcard Berbasis Pictorial Riddle Pada Materi Plantae untuk Meningkatkan Motivasi Dan Pemahaman Konsep Siswa SMA/MA Kelas X. *Berkala Ilmiah Pendidikan Biologi (BioEdu).* 2019; **8**(2); 260-269. Available from: https://ejournal.unesa.ac.id/index.php/bioedu/article/view/28798.

[37] Yulianto E, Cahyani PD, and Silvianita S. Perbandingan Kehadiran Sosial dalam Pembelajaran Daring Menggunakan WhatsApp Group dan Webinar Zoom Berdasarkan Sudut Pandang Pembelajar Pada Masa Pandemic Covid-19. *Jartika: Jurnal Riset Teknologi dan Inovasi Pendidikan*. 2020; **3**(2): 331-341. Available from: https://journal.rekarta.co.id/index.php/jartika/article/view/361.

[38] Sinaga R and Simarmata EJ. Media Gambar Terhadap Diskalkulia di Sekolah Dasar. *Tunas Bangsa*. 2020; **7**(2): 219-234. DOI: https://doi.org/10.46244/tunasbangsa.v7i2.1135.

[39] Hasyda S. Implementasi JIM (Juris Prudential Inquiri Model) Berbantuan Media Gambar untuk Meningkatkan Keterampilan Berpikir Kritis Siswa di Era *New Normal* di Sekolah Dasar. *Jurnal Basicedu*. 2021; **5**(5): 4152-4159. DOI: https://doi.org/10.31004/basicedu.v5i5.1524.

[40] Ndae MA and Widyaningrum DA. Pengaruh Model Pembelajaran *Recripocal Teaching Pair Share* dengan Media Gambar terhadap Kemampuan Berpikir Kritis Siswa SMA. *Quagga: Jurnal Pendidikan dan Biologi*. 2020; **12**(1): 76-84. DOI: https://doi.org/10.25134/quagga.v12i1.2297.

[41] Nurlaela L. Pengaruh Media Pembelajaran dan Motivasi Belajar terhadap Kemampuan Berpikir Kritis Siswa. *Jurnal Ilmiah Pendidikan Guru Sekolah Dasar*. 2017; **1**(2): 180-187. Available from: https://trilogi.ac.id/journal/ks/index.php/JIPGSD/article/view/108.

[42] Vieira F, Flores MA, da Silva JLC, Almeida MJ, and Vilaca T. Inquiry-Based Professional Learning in the Practicum: Potential and Shortcomings. *Teaching and Teacher Education*. 2021; **105**: 103429. DOI: https://doi.org/10.1016/j.tate.2021.103429.