Mathematics Education Journals
Vol. 5 No. 1 February 2021

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

Students' Activity in Online Learning Application Using LAPS-Heuristic Model in Geometry Material

Anis Farida Jamil[1], Mayang Dintarini[2]

[1,2]Mathematics Education Program Study, University of Muhammadiyah Malang,
E-mail : anisfarida@umm.ac.id

Abstract

During the Covid-19 pandemic, learning was fully carried out online. However, the implementation of learning is still not optimal, especially in evaluating student activities.Using online learning, lecturers have difficulty observing student activities, and mostly, online learning was done using assignments or even a teacher-centered. This research was expected to accommodate the application of online learning by the student center using the LAPS-Heuristic model. This study aims to describe student activities in the application of online learning using the Logan Avanue Problem Solving (LAPS)-Heuristic model on geometry material. This research uses a descriptive qualitative-quantitative approach. The research steps were carried out, starting from research planning, implementing the LAPS-Heuristic model online, analyzing, and evaluating activities. Student activity data were obtained from observations made by researchers and one observer. Based on the findings in the study, student activities in the application of online learning using the LAPS-Heuristic model on geometry material are described in 7 aspects. The seven aspects are visual, verbal, listening, writing, drawing, calculating / problem solving, and emotional aspects. In learning reflection material online by applying the LAPS Heuristic learning model, the seven aspects of the activity appear very well.

Keywords: activity; LAPS- Heuristic geometry

INTRODUCTION

Corona Virus Disease 2019, abbreviated as covid-19, is a new virus that appeared at the end of 2019 for the first time in Wuhan, China (Fauzi et al., 2020; Rothan & Byrareddy, 2020). In February 2020, Covid-19 was declared a pandemic by WHO (Mesa Vieira, Franco, Gómez Restrepo, & Abel, 2020). The stipulation of the Covid-19 pandemic has caused almost all countries in the world to implement social distancing (De Vos, 2020; Favale, Soro, Trevisan, Drago, & Mellia, 2020; Mesa Vieira et al., 2020; Qazi et al., 2020). The application of social distancing affects various aspects, including the educational aspect. In the educational aspect, the application of social distancing has resulted in face-to-face learning being stopped in various countries and Indonesia.

During the Covid-19 pandemic, face-to-face learning in Indonesia was replaced by online learning (Jamaluddin, Ratnasih, Gunawan, & Paujiah, 2020; Khasanah, Pramudibyanto, & Widuroyekti, 2020; Zhafira, Ertika, & Chairiyaton, 2020). Online learning is learning that is done through the internet. Students learn

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

from their respective homes using a specific platform that is accessed through the internet network. This policy was carried out by the government to stop the spread of covid-19 (Kemdikbud, 2020). But online learning has many obstacles (Jamaluddin et al., 2020; Rusdiana & Nugroho, 2020). Obstacles that arise in online learning are two main aspects, namely aspects of online facilities and the students themselves (Hikmat, Hermawan, Aldim, & Irwandi, 2020; Jamaluddin et al., 2020).

Difficulties in implementing online learning in tertiary institutions from the aspect of facilities that not all universities have good online learning infrastructure. Another obstacle to the aspect of online facilities is the sufficient quality of the internet network, both for students and lecturers. (Jamaluddin et al., 2020; Pangondian, Paulus, & Nugroho, 2019; Windhiyana, 2020).

Inadequate campus infrastructure for the implementation of online learning will result in online learning not being carried out optimally. Meanwhile, the obstacle to implementing online learning from the student aspect is the difficulty in knowing student activities. Lecturers will have difficulty monitoring student activities because they cannot observe directly. In addition, based on research on student online activities conducted by (Aswasulasikin, 2020) showed that students are getting boredso that lecturers must be creative and innovative in planning online learning.

Based on the results of observations on online learning that had been carried out during the Covid-19 pandemic in the UMM, chiefly in Study Program of Mathematics Education, it showed that the implementation of online learning did not facilitate activities which is focused on collaborative skills. Online learning is implemented using assignments and tends to be teachercentered. There is no implementation of online learning by forming student discussion groups. Group discussions between students are an effective way to increase student activities. Student's discussions also make them have more understanding of the material (Hastuti, Nusantara, & Susanto, 2016; Juniar, Rohyana, & Rahmat, 2019). Lecturers tend not to evaluate student activities in online learning.

A learning model that can support student activities is the LAPS-Heuristic model. LAPS -Heuristic is a learning model that guides students in solving a problem through guiding questions (Azwardi & Sugiarni, 2019; Rahman, Murnaka, & Wiyanti, 2018; Suryani & Iqbal, 2018). The LAPS-Heuristic model is carried out by forming student discussion groups to solve a mathematical problem. In solving these math problems, students are given guiding questions or prompting. Many study explained about the effect of implemantation of LAPS-Heuristic in their learning (Anggrianto, Churiyah, & Arief, 2016; Chavez, 2007; Husna, Zubainur, & Ansari, 2018; Tambunan, 2018). But almost the researcher focused of its effect or impact related to the spesific skill of students, like creative thinking, problem solving, activity etc.

In this study, the LAPS-Heuristic model will be implemented in online learning using the LMS platform (elmu.umm.ac.id). ELMU is a learning management system (LMS) supported by CANVAS. Some research about implementation of Canvas LMS had been explained before. Canvas LMS is a simply tools for teaching and learning activities (Duin & Tham, 2020). Canvas

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

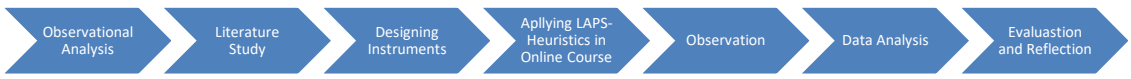
LMS could help teacher to obtain the academic information data of students, for improving the quality of the learning process (Fernández, González, Merino, & Kloos, 2017). On the ELMU (E-Learning Muhammadiyah) platform, small discussion groups will be formed, which will be given a LAPS-Heuristic based worksheet, which contains math problems and its prompting to help students solve the problems. The use of Canvas LMS to support group discussion had been studied by Desai (2020), that explained group discussion in Canvas LMS have good impact to students' grade. But, in his study, Desai (2020) did not use a spesific learning model. So, the online learning using the LAPS-heuristic model is expected to make student cooperative and collaborative activities well carried out in this study.

Thecontent which used inthis research is geometry. Geometry can be connected to the students' daily life (Baeti & Murtalib, 2019; Hidayati & Riszal, 2019). In addition, to help students understand geometry problems, the problems need to be in their life. This content is a perfect matching to LAPS-Heruristic model, that encourages the students to solve the problem by rethinking about what the problem is, looking for other solution, and looking for the effective method to solve the problems (Anggrianto et al., 2016). Based on these explanations, this study aims to describe student activities in applying the LAPS-Heuristic online learning model to geometry material.

RESEARCH METHOD

This research used a qualitative-quantitative approach, using descriptive research. The subjects of this study were students of the Mathematics Education Study Program of the University of Muhammadiyah Malang, who were currently taking a Geometry course. The application of the LAPS-Heuristic Learning Model is carried out in online learning using the ELMU platform. The learning model was seen by student grouping activities and student worksheets for discussions conducted in ELMU's forums using ELMU.

The research steps were carried out, starting from research planning, implementing the LAPS-Heuristic model online, analyzing, and evaluating activities. The research steps carried out in this study are described in the chart contained in Picture 1.



Picture 1. Research Procedure

Based on Picture 1, this research procedure consists of seven stages. The first stage is observational analysis. In this first stage, observations were made on research subjects, also the online learning facilities provided. The second stage is literature study, where at this stage the collection of information and studies on similar previous studies is carried out. The third stage is designing the instrument. At this stage, the activities carried out are designing research instruments, including student activity observation sheets. In addition, at this stage, a learning

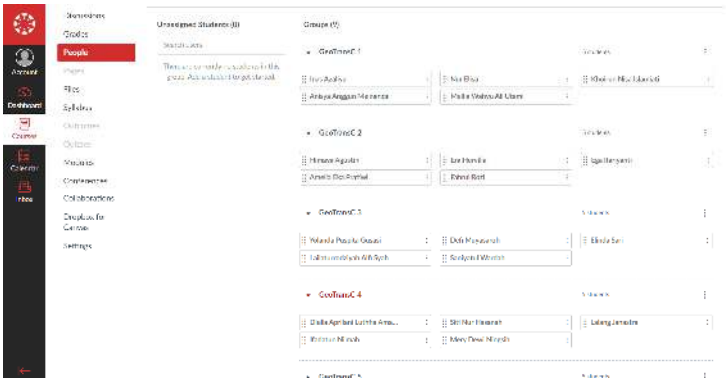
ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

implementation plan was made using the LAPS-Heuristic model and student worksheets as learning media. The fourth stage is to apply the LAPS-Heuristic model to lectures. The fifth stage is observation. At this stage, observations are made of student activities during learning. The observer fills in the observation sheet provided. The sixth stage is carried out after obtaining data from the results of observing student activities. This sixth stage is to analyze the observation data. The last stage is to evaluate and reflect.

Student activity data were obtained from observations made by researchers and one observer, a Mathematics Education Lecturer. Dierich in Hamalik (2014: 288-209) states that learning activities are divided into eight groups, including visual, oral (oral), listening, writing, drawing, measuring, mental, and emotional activities. These eight aspects observed in discussion forums conducted by students in online learning. The data analysis used in this research is to examine the percentage of all observations. The results of the assignment were analyzed by describing each indicator in the activity aspect.

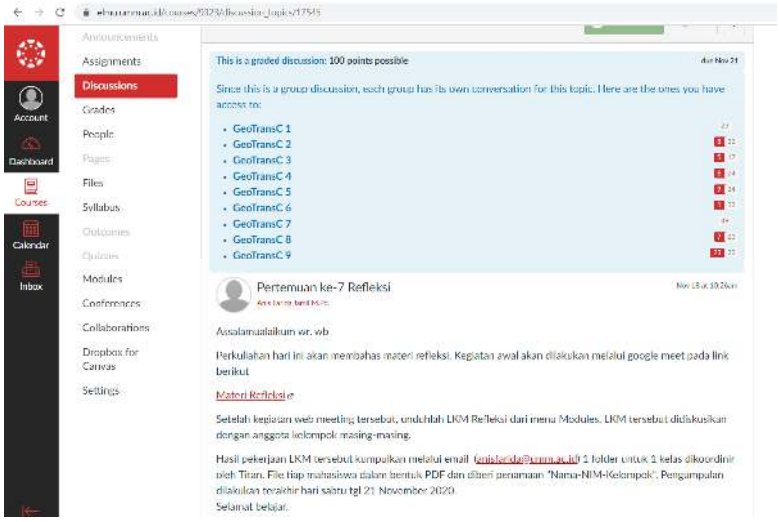
RESULTS AND DISCUSSION

Online learning was carried out on the LMS platform with the address elmu.umm.ac.id in the course of transformation geometry meanly in concept of reflection. Learning was done using the Logan Avenue Problem Solving (LAPS) Heuristic model. This model is characterized by a problem-based and student center approach to learning (Sanaki, 2020). The steps has been taken in online learning using the LAPS Heuristic model, namely, 1) the lecturer delivers the material via google meet, 2) the lecturer divides students into nine groups randomly on the elmu.umm.ac.id platform where each group consists of 5 people, 3) students are given student worksheets (LKM) characterized by LAPS-Heuristic that is problem-based, 4) students discuss with their respective groups, 5) each group collects the results of the LKM work. The following picture showed the division of student groups on the ELMU page.



Picture 2. Grouping in ELMU

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ



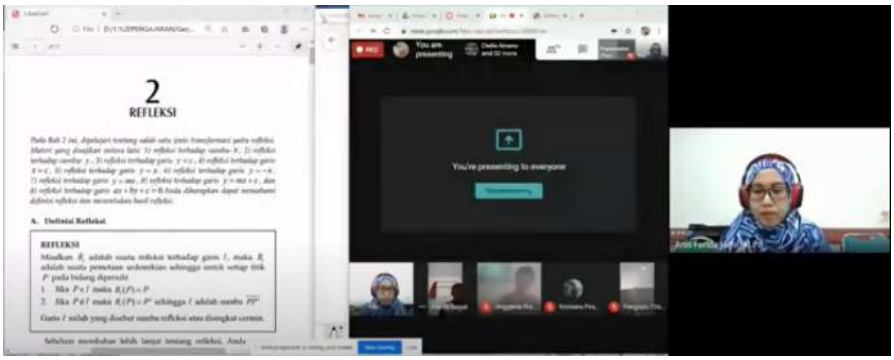
Picture 3. Group Discussion menu in ELMU

The use of the LAPS-Heuristic model can show seven aspects of student activity that happened in learning. The following is an explanation of each aspect of student activity.

Visual Aspect

The visual aspect of student activities in the LAPS-Heuristic model of online learning was observed in three different activities. The three activities include when the lecturer conducts a web meeting via google meet on material explanationsfacilitating discussion among lecturers and other students. The observer fills in the online observation sheet using google form and provides notes on the results while observing. Indicators of learning activities in the visual aspect which was students paying attention to explanations, pictures, or illustrations submitted by their lecturers/friends (Oemar, 2011). In the LAPS-Heuristic model learning, student activity on the visual aspect of the web meeting lecturer explanation reached in a good category. This is shown when the student web meeting turns on the video and observes the lecturer's explanation. In discussion activities in ELMU either lecturers or group members, it was seen that students being active in providing question and responding the other answers, which were showed that students paid attention to their friends' explanations. Student activities in the visual aspect of discussion activities with lecturers is in intermediete category, while discussions with friends are in a good category. The following picture showed a student using web meeting while the lecturer explains the material.

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

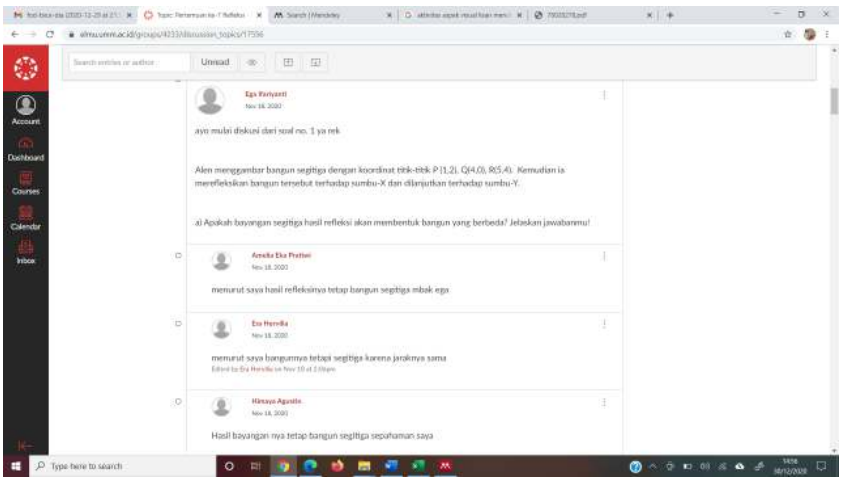


Picture 4. Lecturer's Explanation on Web-Meeting

In the picture 4, students turning on the video to pay attention to the lecturer's explanation. Students respond to questions and ask regarding content that they did not understand well. It proved that they have been paid attention to the lecturer's explanation and do visual aspects of their learning activities. Learning with the LAPS-Heuristic model is continued to do LKM so that students can learn independently and discuss with friends to solve a problem. This makes learning student-centered. Student-centered learning can increase activities, one of which is the visual aspect (Sasmita, 2017).

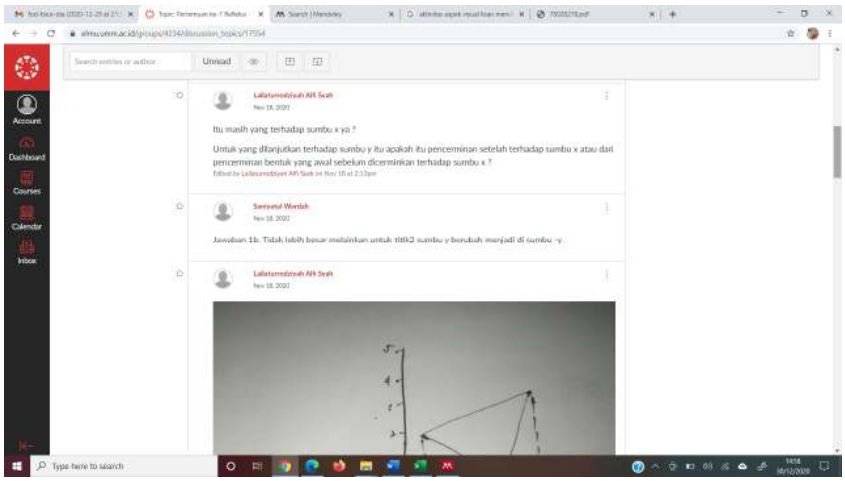
Oral Aspect

The oral aspect of student learning activities is shown by students giving responses in the form of questions, statements, or answers to explanations given by lecturers or friends. Oral aspects were observed in group discussion activities using ELMU. The results of the observation showed that the student activity in the oral aspect was in the very good category. In the chat recordings between students and their group members, students can see the initiative to start a discussion with their group members to solve problems with the LKM. It was also seen that other group members gave responses in the form of comments and opinions in solving problems. The following is a chat excerpt from group 2.



Picture 5. Student's discussion, Group 2 on ELMU

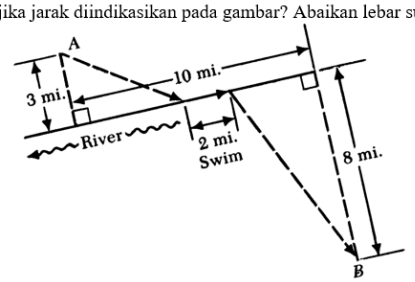
ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ



Picture 6. Student's discussion, Group 2 on ELMU

Based on observations on student discussion activities for each group, all groups have active discussions, and some groups are very active in solving problems given in the worksheet. Giving questions on reflection material with a problem-based approach to everyday life encourages students to be able to provide opinions and solve problems more easily. So that students can be more active in carrying out their learning activities, especially on the oral aspect. Communication skills are important for articulating ideas, helping the process of formulating thoughts that form the basis for solving problems (Aulia, Suwatno, & Santoso, 2018). The following picture illustrated an example of the display of question exercises in problem-based LKM on LAPS-Heuristic learning.

2. Perenang jarak jauh berlatih renang untuk mengikuti kejuaraan renang, pergi dari rumahnya di titik A untuk menemui pujaan hatinya di titik B. Karena dia mengondisikan dirinya untuk kejuaraan, dia memutuskan untuk berenang melawan arus sungai dengan jarak 2 mil sebelum memotong sungai yang memisahkannya dari kekasihnya. Karena ia tidak menyukai berjalan kaki lebih banyak dari biasanya, dia menggunakan pengetahuannya mengenai isometri untuk menentukan titik terbaik di pinggiran sungai untuk ia memulai berenang. Berapa jauh dia berjalan dari A ke B jika jarak diindikasikan pada gambar? Abaikan lebar sungai.



Picture 7. The problem in the worksheet

Listening Aspect

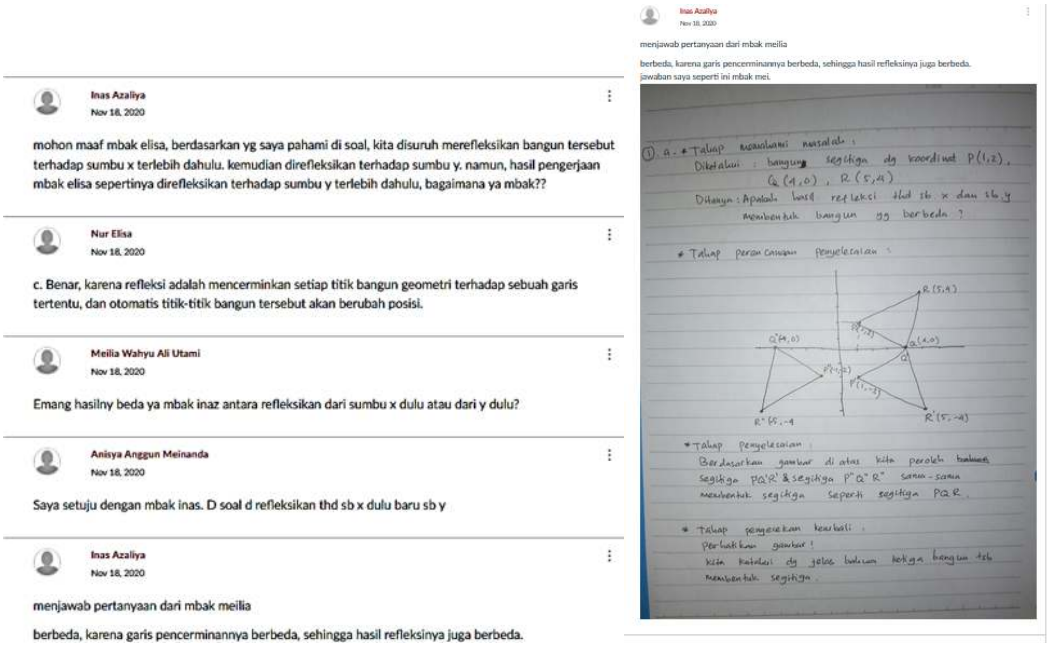
Student activities in the listening aspect were observed through the lecturer's explanation on web-meeting. The listening aspect cannot be separated from the visual aspect of the material explanation activities carried out by the lecturer. Based on the results of the observations, it was found that both the listening aspect of student activities were categorized. This is indicated by the response in the form of questions and student answers to the explanations given by the lecturers. this

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

response showed that students listen to the lecturers' explanation of the material given. The LAPS-Heuristic model in online learning facilitates student learning activities in the listening aspect by implementing learning through web meetings. Students who listen to lecturers' explanations well through LAPS-Heuristic learning can increase student learning activeness in accordance with research conducted by (Rahayu, Karso, & Ramdhani, 2019).

Writing Aspect

The fourth aspect of the activity that is observed in this research was writing. Students very well write their ideas or opinions about problems in discussion forums. In the group discussion, all students have participated actively in writing their opinions in discussion forums at LMS. This is related to the previous research (Anisah, 2018), which stated that LAPS Heuristic can improve writing activities, which can be seen from the activity of writing notes, writing discussion results, and making discussion conclusions. The following is a screenshot of the student discussion on the discussion menu at LMS.



Picture 8. Student's writing activities

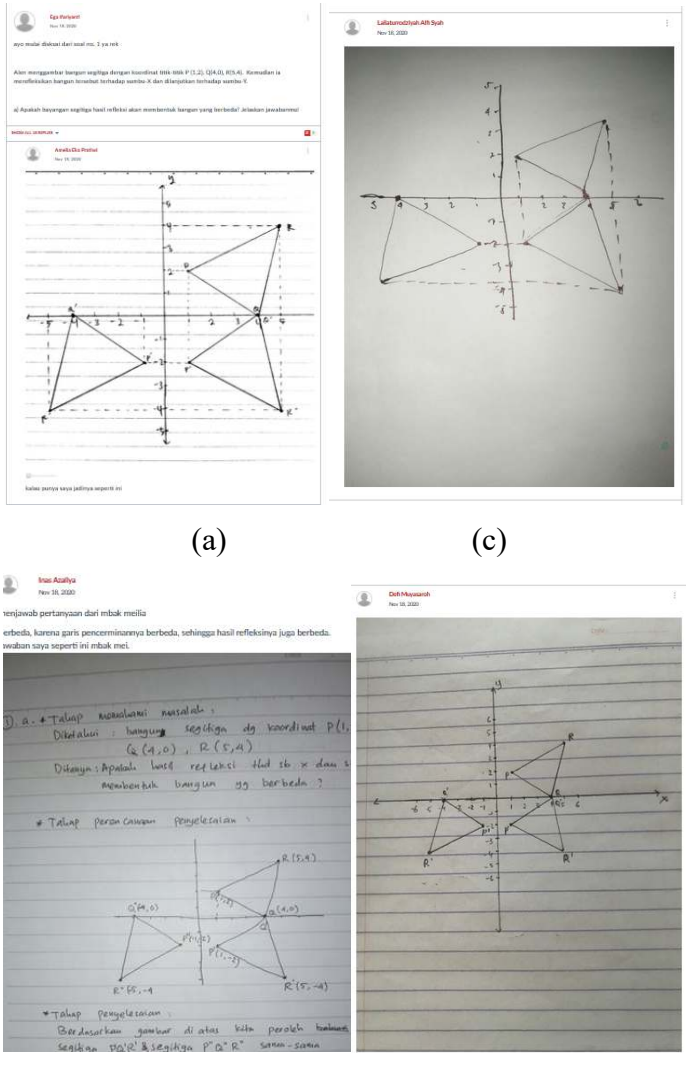
Picture 8 illustrated the discussion that occurred in one group in the Transformation Geometry class. It can be seen that students actively write down what is not understood, as well as what has been understood. Students also write down their ideas/opinions/answers on a sheet of paper to make it easier for them to express their ideas. It because LMS was still limited in drawing and writing mathematical expressions. (Chavez, 2007) stated that LAPS-Heuristic contains fun and challenging activities so that students become interested in writing their opinions about the problems given.

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

Drawing Aspect

The fifth aspect of student activity is drawing. Students are able to describe problems in a graphic or a diagram. This can be seen in the discussion, where students describe the results of the triangle reflection well (Anisah, 2018).

In the discussion, it can be seen that at least one student displays the results of his work in the form of a triangle image to answer the problems given. In some groups, the drawing aspect is still dominated by certain students. Not all students are involved in this aspect of drawing. It was rather difficult to see because this research was done online. When students do not upload their work, there are still two possibilities. That is, students are not active in drawing, or students have drawn but do not convey it in a discussion forum.



(a) (c)

(b) (d)

Picture 9. Drawing Aspect

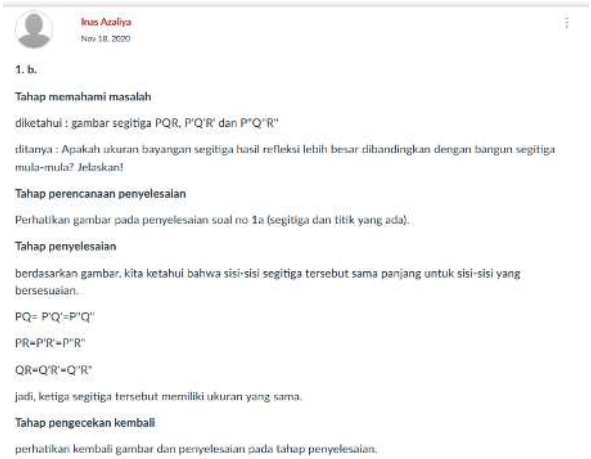
In the picture above, it can be seen that students have described the results of the reflection requested. Some students draw well, as shown in pictures 9(a) and

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

9(d). students draw neatly using a ruler, write coordinates with a correctly scale, and write down the coordinate axes. Whereas in pictures 9(c) and 9(d), the students describe not using a ruler, so the images that are formed are not neat and do not write information about the coordinate axes.

Measuring/Calculating/Solving Problem Aspect

The sixth aspect is measuring/calculating/solving problems. In the aspect of solving this problem, it appears that students are active in solving problem number 1 regarding reflection. This is in accordance to the previous study (Rahayu & Suryakancana, 2019) which stated that in their LAPS-Heuristic research, almost all aspects of activity were carried out very well. And less active in solving problem number 2. Problem number 1 is relatively easier to solve than number 2. Students tend to be active in solving and possibly calculating problems that are easier. Only a small part of the group and students actively came up with ideas and tried to count or solve problem number 2.


Inas Azaliya
Nov 18, 2020

1. b.

Tahap memahami masalah

diketahui : gambar segitiga PQR, P'Q'R' dan P''Q''R''

ditanya : Apakah ukuran bayangan segitiga hasil refleksi lebih besar dibandingkan dengan bangun segitiga mula-mula? Jelaskan!

Tahap perencanaan penyelesaian

Perhatikan gambar pada penyelesaian soal no 1a (segitiga dan titik yang ada).

Tahap penyelesaian

berdasarkan gambar, kita ketahui bahwa sisi-sisi segitiga tersebut sama panjang untuk sisi-sisi yang bersesuaian.

PQ= P'Q'=P''Q''

PR=P'R'=P''R''

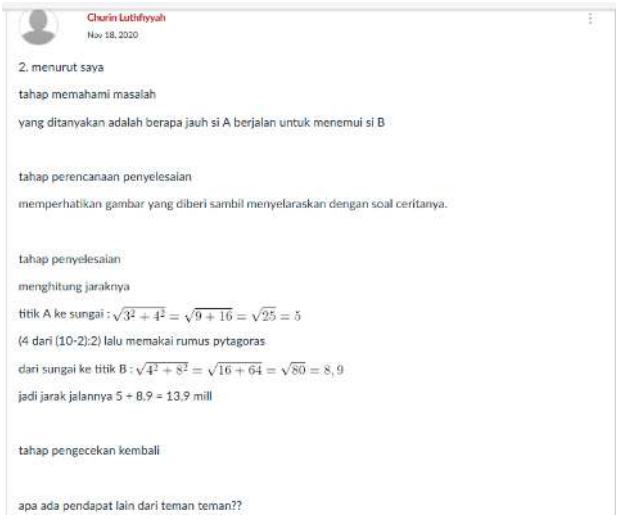
QR=Q'R'=Q''R''

jadi, ketiga segitiga tersebut memiliki ukuran yang sama.

Tahap pengecekan kembali

perhatikan kembali gambar dan penyelesaian pada tahap penyelesaian.

Picture 10. Example of student solve problem number 1


Churin Luthfiyyah
Nov 18, 2020

2. menurut saya

tahap memahami masalah

yang ditanyakan adalah berapa jauh si A berjalan untuk menemui si B

tahap perencanaan penyelesaian

memperhatikan gambar yang diberi sambil menyelaraskan dengan soal ceritanya.

tahap penyelesaian

menghitung jaraknya

titik A ke sungai : $\sqrt{3^2+4^2} = \sqrt{9+16} = \sqrt{25} = 5$

(4 dari (10-2):2) lalu memakai rumus pytagoras

dari sungai ke titik B : $\sqrt{4^2+8^2} = \sqrt{16+64} = \sqrt{80} = 8,9$

jadi jarak jalannya 5 + 8,9 = 13,9 mill

tahap pengecekan kembali

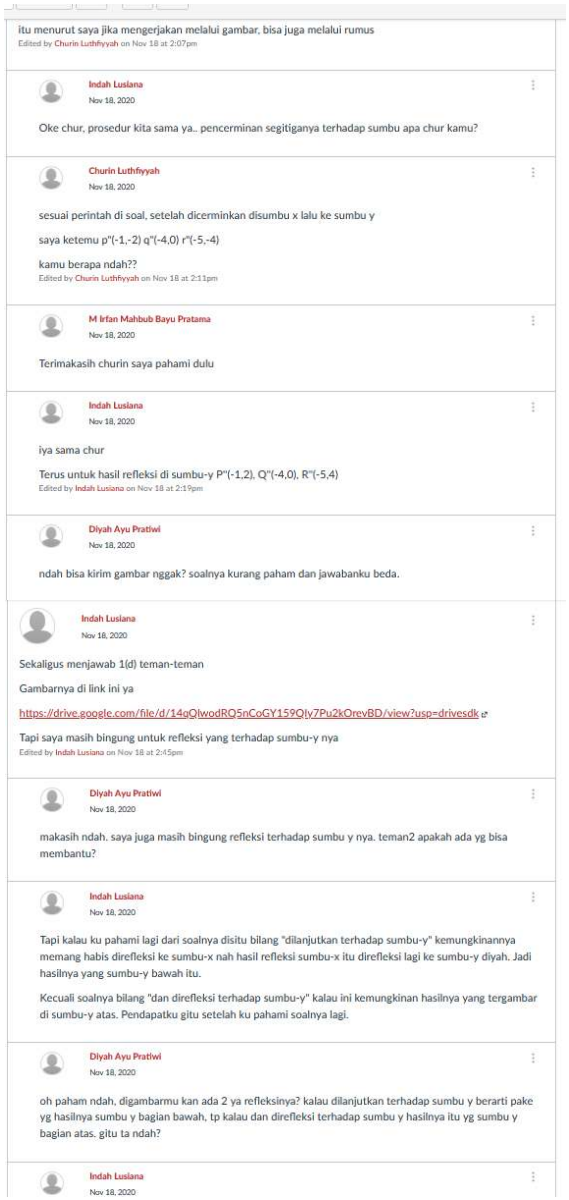
apa ada pendapat lain dari teman teman??

Picture 11. Example of student solve problem number 2

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

Emotional Aspect

The last aspect of activeness discussed in this study is the emotional aspect. The first indicator of the emotional aspect of this student is that students are able to receive responses from lecturers/friends who have different responses from themselves (Anisah, 2018). In this first indicator, students are doing very well.



Picture 12. Screenshot of student's discussion that can describe the emotional aspect of them

In the picture above, it can be seen that one has a difference in opinion from the answer his friend gave. And the students humbly discuss to get the results they think are most suitable. The picture also illustrates that students did not give up on solving problems and communicate well in discussions.

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

CONCLUSION

Based on the findings in research, student activities in the application of the LAPS-Heuristic online learning model on geometry are described in 7 aspects. The seven aspects are visual, verbal, listening, writing, drawing, calculating / problem solving, and emotional aspects. In learning reflection material online by applying the LAPS Heuristic learning model, the seven aspects of the activity appear very well.

REFERENCES

Anggrianto, D., Churiyah, M., & Arief, M. (2016). Improving Critical Thinking Skills Using Learning Model Logan Avenue Problem Solving (LAPS) - Heuristic. *Journal of Education and Practice*, *7*(9), 128–136.

Anisah, F. (2018). The students ' activity profiles and mathematic problem solving ability on the LAPS-heuristic model learning. *Unnes Journal of Mathematics Education*, *7*(1), 72–77. https://doi.org/10.15294/ujme.v7i1.17087

Chavez, J. A. (2007). ENLIVENING PROBLEMS WITH HEURISTICS THROUGH LEARNING ACTIVITIES AND PROBLEM SOLVING (LAPS) Jerome A. Chavez. *Learning Science and Mathematics*, (2), 1–8.

Desai, U. (2020). *STUDENT INTERACTION NETWORK ANALYSIS ON CANVAS LMS*. Miami University.

Duin, A. H., & Tham, J. (2020). The Current State of Analytics: Implications for Learning Management System (LMS) Use in Writing Pedagogy. *Computers and Composition*, *55*, 102544. https://doi.org/10.1016/j.compcom.2020.102544

Fernández, A. R., González, F. S., Merino, P. J. M., & Kloos, C. D. (2017). A data collection experience with canvas LMS as a learning platform. *CEUR Workshop Proceedings*, *1925*, 109–123.

Husna, U., Zubainur, C. M., & Ansari, B. I. (2018). Students ' creative thinking ability in learning mathematics through learning model of Logan Avenue Problem Solving (LAPS) – Heuristic Students ' creative thinking ability in learning mathematics through learning model of Logan Avenue Problem Solving (. *Journal of Physics: Conference Series*, *1088*, 0–6.

Tambunan, H. (2018). Impact of Heuristic Strategy on Students ' Mathematics Ability in High Order Thinking. *INTERNATIONAL ELECTRONIC JOURNAL OF MATHEMATICS EDUCATION E-ISSN:*, *13*(3), 321–328.

Aswasulasikin, A. (2020). Persepsi Mahasiswa Terhadap Kuliah Daring dimasa Pandemi Corona Virus Disease (COVID-19). *SALAM: Jurnal Sosial Dan Budaya Syar-I*, *7*(8). https://doi.org/10.15408/sjsbs.v7i8.15734

Aulia, M., Suwatno, S., & Santoso, B. (2018). Meningkatkan Keterampilan Komunikasi Lisan Melalui Metode Storytelling. *Jurnal MANAJERIAL*, *17*(1). https://doi.org/10.17509/manajerial.v17i1.9780

Azwardi, G., & Sugiarni, R. (2019). Peningkatan Kemampuan Pemecahan Masalah Matematis Melalui Model Pembelajaran Laps-Heuristik. *Pi: Mathematics Education Journal*, *2*(2), 62–68. https://doi.org/10.21067/pmej.v2i2.3335

Baeti, N., & Murtalib, M. (2019). Analisis Keterampilan Geometri Siswa Dalam Memecahkan Masalah Geometri Berdasarkan Tingkat Berpikir Van Hiele Di

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

Mts Muhammadiyah 1 Malang. *Supermat (Jurnal Pendidikan Matematika)*, *2*(2), 39–50. https://doi.org/10.33627/sm.v2i2.96

Chavez, J. A. (2007). Enlivening Problems With Heuristics Through Learning Activities And Problem-Solving (LAPS) Jerome A. Chavez. *Learning Science and Mathematics*, (2), 1–8.

De Vos, J. (2020). The effect of COVID-19 and subsequent social distancing on travel behavior. *Transportation Research Interdisciplinary Perspectives*, *5*. https://doi.org/10.1016/j.trip.2020.100121

Fauzi, A., Husamah, H., Miharja, F. J., Fatmawati, D., Permana, T. I., & Hudha, A. M. (2020). Exploring COVID-19 Literacy Level among Biology Teacher Candidates. *EURASIA Journal of Mathematics, Science and Technology Education*, *16*(7).

Favale, T., Soro, F., Trevisan, M., Drago, I., & Mellia, M. (2020). Campus traffic and e-Learning during COVID-19 pandemic. *Computer Networks*, *176*. https://doi.org/10.1016/j.comnet.2020.107290

Hastuti, I. D., Nusantara, T., & Susanto, H. (2016). Constructive Metacognitive Activity Shift in Mathematical Problem Solving. *Educational Research and Reviews*, *11*(8), 656–667. https://doi.org/10.5897/ERR2016.2731

Hidayati, D. W., & Riszal, A. (2019). Bahan Ajar Geometri Analitik Berbasis Geogebra dan Kreativitas Belajar: Dapatkah Meningkatkan Kemampuan Pemecahan Masalah? *JNPM (Jurnal Nasional Pendidikan Matematika)*, *3*(2), 191. https://doi.org/10.33603/jnpm.v3i2.2509

Hikmat, Hermawan, E., Aldim, & Irwandi. (2020). Efektivitas Pembalajaran Daring Selama Masa Pandemi Covid-19 : Sebuah Survey Online. *Digital Library, UIN SUnan Gung Djati, Bandung*, 1–7.

Jamaluddin, D., Ratnasih, T., Gunawan, H., & Paujiah, E. (2020). Pembelajaran Daring Masa Pandemik Covid-19 Pada Calon Guru : Hambatan, Solusi dan Proyeksi. *Karya Tulis Ilmiah UIN Sunan Gunung Djjati Bandung*, 1–10.

Juniar, D. T., Rohyana, A., & Rahmat, A. A. (2019). Pengembangan Model Pembelajaran Diskusi Kelompok Dalam Meningkat Pemahaman dan Aktivitas Belajar Mahasiswa. *JUARA : Jurnal Olahraga*, *4*(1), 15. https://doi.org/10.33222/juara.v4i1.381

Khasanah, D. R. A. U., Pramudibyanto, H., & Widuroyekti, B. (2020). Pendidikan Dalam Masa Pandemi Covid-19. *Jurnal Sinestesia*, *10*(1), 41–48.

Mesa Vieira, C., Franco, O. H., Gómez Restrepo, C., & Abel, T. (2020). COVID-19: The forgotten priorities of the pandemic. *Maturitas*, *136*, 38–41. https://doi.org/10.1016/j.maturitas.2020.04.004

Pangondian, R. A., Paulus, S. I., & Nugroho, E. (2019). Faktor - Faktor Yang Mempengaruhi Kesuksesan Pembelajaran Daring Dalam Revolusi Industri 4.0. In *Seminar Nasional Teknologi Komputer & Sains (SAINTEKS)* (pp. 56–60).

pengelola web Kemdikbud. (2020). Kemendikbud Dorong Pembelajaran Daring Bagi Kampus Di Wilayah Terdampak Covid-19. *Www.kemdikbud.go.id*.

Qazi, A., Qazi, J., Naseer, K., Zeeshan, M., Hardaker, G., Maitama, J. Z., & Haruna, K. (2020). Analyzing situational awareness through public opinion to predict adoption of social distancing amid pandemic COVID-19. *Journal of Medical Virology*, *92*(7). https://doi.org/10.1002/jmv.25840

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

Rahayu, N., Karso, K., & Ramdhani, S. (2019). Peningkatan Kemampuan Pemecahan Masalah Matematis dan Keaktifan Belajar Siswa Melalui Model Pembelajaran LAPS-Heuristik. *IndoMath: Indonesia Mathematics Education*, *2*(2). https://doi.org/10.30738/indomath.v2i2.4536

Rahayu, N., & Suryakancana, U. (2019). Peningkatan Kemampuan Pemecahan Masalah Matematis dan Keaktifan Belajar Siswa Melalui Model Pembelajaran LAPS-Heuristik, *2*(2), 83–94.

Rahman, I. S., Murnaka, N. P., & Wiyanti, W. (2018). Pengaruh Model Pembelajaran Laps (Logan Avenue Problem Solving)-Heuristik Terhadap Kemampuan Pemecahan Masalah. *WACANA AKADEMIKA: Majalah Ilmiah Kependidikan*, *2*(1), 48. https://doi.org/10.30738/wa.v2i1.2556

Rothan, H. A., & Byrareddy, S. N. (2020). The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. *Journal of Autoimmunity*, *109*(February), 102433. https://doi.org/10.1016/j.jaut.2020.102433

Rusdiana, E., & Nugroho, A. (2020). Respon pada Pembelajaran Daring bagi Mahasiswa Mata Kuliah Pengantar Hukum Indonesia. *Integralistik*, *31*(1).

Sanaki, F. Y. (2020). Peningkatan Kemampuan Pemecahan Masalah Matematis Siswa SMA Melalui Model Pembelajaran Kooperatif Tipe GI Dan LAPS – Heuristik. *Jurnal Padegogik*, *3*(1). https://doi.org/10.35974/jpd.v3i1.2236

Sasmita, S. (2017). Penggunaan Media Permainan Kartu Kwartet Pintar Sejarah (Kkps) Dalam Upaya Peningkatan Aktivitas Dan Hasil Belajar Pada Siswa Kelas X Ipa 7 Sma Negeri 1 Surakarta Semester Gasal Tahun Pelajaran 2017/2018. *Jurnal Artefak*, *4*(2). https://doi.org/10.25157/ja.v4i2.905

Suryani, S., & Iqbal, I. (2018). Pengaruh Model Pembelajaran Logan Avenue Problem Solving (LAPS-Heuristik) Terhadap Hasil Belajar Siswa Kelas VII SMP Negeri 2 Langsa. *Al-Qalasadi : Jurnal Ilmiah Pendidikan Matematika*, *2*(2), 50–56. https://doi.org/10.32505/V3I2.1203

Windhiyana, E. (2020). Dampak COVID-19 Terhadap Kegiatan Pembelajaran Online Di Perguruan Tinggi Kristen Di Indonesia. *Perspektif Ilmu Pendidikan*, *34*(1), 1–8. https://doi.org/10.21009/pip.341.1

Zhafira, N. H., Ertika, Y., & Chairiyaton. (2020). Daring Sebagai Sarana Pembelajaran Selama Masa Karantina Covid-19. *Jurnal Bisnis Dan Kajian Strategi Manajemen*, *4*(1), 37–45. https://doi.org/https://doi.org/10.35308/jbkan.v4i1.1981