Analysis Creative Thinking Ability and Scientific Communication in HOTS Learning Using Whatsapp Media

Deni Nasir Ahmad¹, Abdul Karim², Ihwan Zulkarnain³, Aster Pujaning Ati⁴, Diah Oga Nusantari⁵

¹,²,³,⁵Mathematics Education, Universitas Indraprasta PGRI, Jakarta, Indonesia
⁴Economic Education, Universitas Indraprasta PGRI, Jakarta, Indonesia

Abstract: The purpose of knowing whenever the achievement of HOT learning through WhatsApp media is to measure the ability to communicate scientifically and think creatively in solving problems related to current problems related to the Covid-19 outbreak in the Population and Environmental Education (PKLH) course. The method used in quantitative research. Where a sample of 30 students in the even academic year 2019/2020 in the physics education study program, Indraprasta PGRI University. The results of the study were students' communication skills at good stages which were 63.3 percent of all existing activities, discussion and reporting of activity results. This is in line with the results of research which explained that the ability to communicate using blended learning and Inquiry will produce scientific communication with an increase above the average learning rate which previously increased by 9% to 15% at the level of each indicator of the student's creative thinking ability test at good or moderate stages with an average of 63% to 73% based on an indicator of test ability. The conclusion in this research is HOT learning with whatsapp media in the experiment, the ability to communicate scientifically and the ability to think creatively has a positive or good change.

1. Introduction
The covid-19 pandemic around the world makes communication in meetings with many people experiencing limitations, especially in face-to-face learning. This makes the limitations of face-to-face physical meetings replaced by communication using technology. Information technology that has developed makes it easier for learning activities, whether it is providing material information, assignments or exams in evaluating learning outcomes. Many technology-based learning media have been prepared by each platform service provider so that teachers or lecturers can take advantage of the sophistication of these learning media. Instructional media in the form of interface includes: zoom meeting, google meeting, WhatsApp and many other learning media that can be used. From the results of Novianto's research, through a descriptive study of internet usage behavior among state university students (FISIP UNAIR) and private universities (FISIP UPN), it was explained that cognitive motives and social interaction motives were the biggest motives for FISIP UNAIR respondents using the internet, while for respondents The main motive of UPN's discipline in searching using the internet is the motive for the benefit of information, in this case the motive is caused due to the respondent's need for scientific information related to their academic interests in the form of academic assignments, research results, journals and scientific articles[1]. Furthermore, from the results of Sahidillah's research, he explained that whatsapp media is a student digital literacy medium where an example of its application is when a student thinks of material that
has been summarized or recorded while at school, if there are friends who need them because their notes are not complete, they can be shared with other friends using forward feature which makes it easy to send or continue to other friends, without having to open the file manager on the device[2].

From the results of this study, it is explained that the use of online communication media is needed in communicating learning activities in schools, especially in campus lectures, especially during the current Covid-19 pandemic where many schools and universities are advised not to have learning and learning activities or lectures. All learning and learning activities or lectures are used using online communication media.

Since March 2020 due to the covid-19 outbreak, especially in Indonesia, it has resulted in large-scale social restrictions in several provinces, including DKI Jakarta. This is what causes all face-to-face activities directly in learning and learning or lectures to be replaced with online communication media.

In the even semester of the 2019/2020 school year researchers used one of the online communication media, namely WhatsApp, in lectures or learning and learning activities. Based on the results of Yusmita's research regarding the use of whatsapp in interpersonal communication of students of communication science at Halu Oleo University, whatsapp is very useful and helps in the process of communicating, giving and receiving information as well as self-disclosure of the ability to reveal oneself in providing personal information to others in private, voluntary and deliberately for the purpose of providing accurate information about oneself as well as having an empathetic nature where a person's ability to position himself against what is being experienced by others and similarities in communicating in order to be achieved or established smoothly[3].

From the results of a research study on the advantages of online communication media, researchers select and use WhatsApp media in delivering lecture material. Apart from these advantages, it is also due to the low cost with good facilities, namely in the form of voice messages, videos, sending files and pictures as well as the presence of group and private communication rooms. This is what makes researchers take advantage of this communication medium in every lecture. In addition to the purpose of using these communication media in lectures or learning and learning, researchers want to get feedback in learning or lectures through the help of these communication media.

In knowing the achievement of lectures, the researcher uses the HOTs (Higher Order Thinking Skill) learning method on the basis that the researcher wants to know the ability of scientific communication and creative problem solving in covid-19 conditions in the community in the PKLH (Population and Environmental Education) course. In Wahid's research, he explained that the integration of HOTs use is a. In the stage of expressing opinions, HOTs can be integrated in a way that does not limit students in submitting assumptions, ideas, or opinions through inquiry or making conjectures. b. In the evaluation and selection stages, HOTs can be integrated by asking students to look for various alternative answers and solutions. c. In the implementation stage, HOTs can be integrated by asking students to conclude with their own creativity [4]. Furthermore, based on the results of Jailani's research, among others, that the implementation of problem-based learning will produce: a. Higher order thinking skills (HOTs) and character, the characters formed by students produce higher order thinking skills (HOTs) in the form of creativity because the teacher provides material in the form of problems that are solved in higher order thinking (HOTs), namely creative. b. in learning discussions and presentations it is more effective because the learning process (input) is achieved [5]. It can be concluded that HOTs will form abilities or characters in the form of creativity by looking for answers to problems in the form of alternative solutions where learning requires giving problems and communicating on a problem through discussion or group presentations.

One of the higher order thinking skills that can be used to solve a problem is creative thinking skills. Creative thinking is a thought process that produces a wide variety of possible ideas and ways [6]. Creative thinking is an important component for one's success in carrying out life activities [7]. Indicators of aspects of creative thinking skills are aspects of fluency, flexibility, originality, elaboration and evaluation skills [8]. Next, think creatively, namely: a. In terms of process, it is the response of students in solving problems using appropriate methods, b. creative thinking process, starting from students knowing the existence of a problem to communicating the results of their thoughts, c. product or result [9]. From the statement of this opinion, it can be concluded that creative
thinking is an important component in the success of life where the process of thinking is smooth, flexible, original, detailed, and judging a product or result based on a creative thinking process. Scientific communication requires clear language skills where the words used must be expressed explicitly to prevent misunderstanding of meaning [10]. The observed indicators of scientific communication skills are: (1) writing empirical data from experiments or observations, (2) discussing the results of activities of a problem, (3) compiling and writing reports systematically, and (4) submitting reports on the results of experiments or observations [11]. Based on the results of Nana's research, the results of scientific communication in learning, namely the achievement of the 1st aspect, namely compiling and submitting reports systematically and clearly increased by 10.15%. The achievement of the second aspect is explaining the experimental results increased by 6.98%. The achievement of the third aspect, namely discussing the results of the experiment, increased by 7.38%. The achievement of the fourth aspect, namely classifying and compiling data, increased by 7.73%. The achievement of the 5th aspect is describing the data in tables, diagrams, or graphs of 4.23%, this shows a significant result because in each aspect it has increased so that it can be concluded that this research is able to improve the scientific communication skills of students of class X MIA 1, SMA Negeri 1 Ciamis [10]. From the results of this opinion it is explained that to obtain learning outcomes, namely the ability to communicate scientifically is based on speaking clearly or informing the results clearly, liberation to think (inquiry) to obtain answers to a given problem. From the background of this problem, the researcher has a research objective, namely to find out how much the achievement of learning with HOTs through WhatsApp media in measuring the ability to communicate scientifically and think creatively in solving problems related to current problems, namely regarding the Covid-19 outbreak in the Education course Population and Environment (PKLH).

2. Research Methods

In obtaining data and managing data, researchers use quantitative research methods. Where the sample is 30 students in the even academic year 2019/2020 in the physics education study program, Indraprasta PGRI University. In obtaining research data, namely taken from the assignment of the results of the observation report on the living environment due to Covid-19 and presentations and discussions on problems that have been given by researchers as a group. To obtain the research results, the researcher used the analysis description and indicator test in the creative thinking and scientific communication skills testing phase using the HOTS learning method. The research design is as follows:

![Research Design](image)

**Figure 1. Research Design**

Information:
X: HOTs Learning with Whatsapp Media Assistance
Y: Ability to Think Creative
Z: Communicating Scientifically

3. Results And Discussion

Following are the results of analyzing research data regarding the ability to think creatively and communicate scientifically in HOTs learning with the help of WhatsApp media, as follows:
3.1. Descriptive Analysis of Data

3.1.1. Scientific Communication

In testing the scientific communication skills of students, researchers used the HOTS learning method with WhatsApp media as a medium for lectures during the Covid-19 pandemic. Population and Environmental Education) in the form of a group observation report file during the Covid-19 epidemic which is the topic of discussion and issues related to environmental health, environmental impacts, and environmental problems caused and the effects of the covid-19 outbreak where each student presents the results. findings and constraints during the observation. The indicators of scientific communication assessment are: (1) writing down empirical data from experiments or observations, (2) discussing the results of activities of a problem, (3) compiling and writing reports systematically, and (4) submitting reports on the results of experiments or observations. Researchers divide scientific communication activities into 3 stages of activity, namely the activity of presenting findings and studies, discussing a problem and reviewing the findings and finally reporting the results of observations. The following are the results of the analysis of the research data description:

3.1.2. Presentation

In taking the results of research data from the presentation of observation results in the discussion in accordance with the Lecture Program Unit (SAP) lectures are made in the form of papers based on problems and studies that will make problems to be made scientific reports. Researchers gave each student a score from the presentation he made. Following are the results of the analysis of the student presentation score data description (sample):

Table 1. Analysis of Presentation Score Description

| Skor | Frequency | Percent | Valid Percent | Cumulative Percent |
|------|-----------|---------|---------------|--------------------|
| 75   | 8         | 26.7    | 26.7          | 26.7               |
| 80   | 15        | 50.0    | 50.0          | 76.7               |
| 85   | 7         | 23.3    | 23.3          | 100.0              |
| Total| 30        | 100.0   | 100.0         |                    |

From the results of the analysis of the description of the presentation score, it can be seen that the highest score is at a score of 80 where there are 15 students or about 50% indicating that scientific communication of students is clearly visible in a positive direction or has been able to communicate scientifically according to the scientific communication assessment indicators.

3.1.3. Discussion

Discussion activities were carried out to test the ability of students in the group to convey findings and answers to audience questions regarding the observations made and report the results. Following are the results of the data description analysis:

Table 2. Analysis of Discussion Score Description

| Skor | Frequency | Percent | Valid Percent | Cumulative Percent |
|------|-----------|---------|---------------|--------------------|
| 70   | 4         | 13.3    | 13.3          | 13.3               |
| 75   | 5         | 16.7    | 16.7          | 30.0               |
| 80   | 19        | 63.3    | 63.3          | 93.3               |
| 85   | 2         | 6.7     | 6.7           | 100.0              |
| Total| 30        | 100.0   | 100.0         |                    |
From the results of the description analysis, it can be seen that the highest score is 80 with 19 students or about 63.3 percent of students. From the results of this analysis, it can be seen that the ability of scientific communication in this discussion activity shows a positive direction where almost 63.3 percent of them are able to communicate scientifically.

3.1.4. Reporting of Results
The results reporting activity is the final activity of a series of analyzing processes in communicating scientifically through a series of activities in the final form of a report on the results of observations. Where at this stage is to test the ability of students in the group to convey findings and answers to audience questions about observational findings in the form of scientific reports. Following are the results of the data description analysis:

| Skor | Frequenc y | Percent | Valid Percent | Cumulative Percent |
|------|------------|---------|---------------|--------------------|
| 65   | 4          | 13.3    | 13.3          | 13.3               |
| 70   | 7          | 23.3    | 23.3          | 36.7               |
| 75   | 9          | 30.0    | 30.0          | 66.7               |
| 80   | 3          | 10.0    | 10.0          | 76.7               |
| 85   | 4          | 13.3    | 13.3          | 90.0               |
| 90   | 3          | 10.0    | 10.0          | 100.0              |
| Total| 30         | 100.0   | 100.0         |                    |

From the results of the description analysis, it can be seen that the highest score is 75 with 9 students or about 30 percent of students. From the results of this analysis, it can be seen that the ability of scientific communication in scientific reporting activities shows a positive direction where nearly 30 percent of them are able to communicate scientifically.

3.2. Creative Thinking Ability
In testing students’ creative thinking skills, researchers used the HOTS learning method with whatsapp media as a medium for lectures during the Covid-19 pandemic. Population and Environmental Education) in the form of a group observation report file during the Covid-19 epidemic which is the topic of discussion and issues related to environmental health, environmental impacts, and environmental problems caused and as a result of the Covid-19 outbreak. From the results of scientific reporting, the student researchers conducted an assessment by making a rubik score as a reference in the assessment. Where the Rubik scores are: score 1: less precise, score 2: quite precise, score 3: good or precise, score 4: very precise. The indicators in measuring the ability to think creatively are as follows: aspects of fluency, flexibility in thinking skills, originality, elaboration and evaluation. The following are the results of the analysis of the research data description:

3.2.1. Aspects of the ability to think fluently (fluency)
In the indicators of testing the ability to think creatively on the aspect of the ability to think fluently, are as follows:

| Skor | Frequenc y | Percent | Valid Percent | Cumulative Percent |
|------|------------|---------|---------------|--------------------|
| 2    | 5          | 16.7    | 16.7          | 16.7               |
| 3    | 19         | 63.3    | 63.3          | 80.0               |
Based on the results of the analysis of the description of the aspect indicator of the ability to think fluently (Fluency) where the highest score was 3 with 19 students or about 63.3 percent, it showed the students' ability to think fluently at a good level. In this analysis, it shows that students in reporting have understood the problems in reporting the final results of observations.

3.2.2. Aspects of the Ability to Think Flexibility (Flexibility)
In the indicators of testing the ability to think creatively on the aspect of flexible thinking skills, are as follows:

Table 5. Analysis of Score Description Aspects of the Ability to Think Flexible

| Skor | Frequency | Percent | Valid Percent | Cumulative Percent |
|------|------------|---------|---------------|--------------------|
| 2    | 9          | 30.0    | 30.0          | 30.0               |
| 3    | 14         | 46.7    | 46.7          | 76.7               |
| 4    | 7          | 23.3    | 23.3          | 100.0              |
| Total| 30         | 100.0   | 100.0         |                    |

Based on the results of the analysis of the description of the indicators for the aspect of the ability to think flexibly (flexibility) where the highest score is 3 with a total of 14 students or about 46.7 percent, it shows the students' ability to think flexibly at a good level. In this analysis, it shows that students in reporting are flexible in analyzing and managing data sources from problems as the final reporting of their observations.

3.2.3. The Ability to Think Original (Originality)
In the indicators of testing the ability to think creatively on aspects of original thinking skills, are as follows:

Table 6. Analysis of Score Description Aspects of Original Thinking Ability

| Skor | Frequency | Percent | Valid Percent | Cumulative Percent |
|------|-----------|---------|---------------|--------------------|
| 2    | 2         | 6.7     | 6.7           | 6.7                |
| 3    | 22        | 73.3    | 73.3          | 80.0               |
| 4    | 6         | 20.0    | 20.0          | 100.0              |
| Total| 30        | 100.0   | 100.0         |                    |

Based on the results of the analysis of the description of the original thinking ability aspect indicators (originality) where the highest score was 3 with a total of 22 students or about 73.3 percent showing the students' ability to think original at a good level. In this analysis, it shows that students in reporting use authenticity in thinking both in expressing ideas and input in analyzing and managing data sources of problems as the final reporting of their observations.

3.2.4. Elaboration Ability
In the indicators of testing the ability to think creatively on the aspect of thinking skills in detail, are as follows:
Table 7. Analysis of Score Description Aspects of Detailed Thinking Ability

| Skor | Frequency | Percent | Valid Percent | Cumulative Percent |
|------|-----------|---------|---------------|--------------------|
| 2    | 4         | 13.3    | 13.3          | 13.3               |
| 3    | 22        | 73.3    | 73.3          | 86.7               |
| 4    | 4         | 13.3    | 13.3          | 100.0              |
| Total| 30        | 100.0   | 100.0         |                    |

Based on the results of the analysis of the description of the indicators for the aspect of the ability to think in detail (elaboration) where the highest score was 3 with a total of 22 students or about 73.3 percent showing the ability of students to think in detail at a good level. In this analysis, it shows that students in reporting have been able to analyze and group the problems that occur which will make the solution or answer to the problem formulation that has been made from managing and obtaining data sources from problems in the final reporting of observations.

3.2.5. Ability to Assess (Evaluation)

In the indicators of testing the ability to think creatively on the aspect of the ability to think assess, are as follows:

Table 8. Analysis of Score Description Aspects of Thinking Ability Assess

| Skor | Frequency | Percent | Valid Percent | Cumulative Percent |
|------|-----------|---------|---------------|--------------------|
| 2    | 5         | 16.7    | 16.7          | 16.7               |
| 3    | 19        | 63.3    | 63.3          | 80.0               |
| 4    | 6         | 20.0    | 20.0          | 100.0              |
| Total| 30        | 100.0   | 100.0         |                    |

Based on the results of the analysis of the description of the indicator for the aspect of the ability to think to assess (evaluation) where the highest score was 3 with 19 students, or about 63.3 percent, it showed the students' ability to think at a good level. In this analysis, it shows that students in reporting have been able to provide creative solutions or answers to the formulation of problems that have been made and answer hypotheses from managing and obtaining data sources from problems in the final reporting of observations.

From the results of the study using descriptive analysis of research data shows that HOTs learning using WhatsApp media in communicating scientifically by discussing a problem that occurred in the Covid-19 outbreak based on the flow of SAP (Lecture Unit) Population and Environmental Education (PKLH) shows that the communication process of taking problems, presenting, discussing and reporting scientifically at a good or positive level provokes students from other groups to participate in discussing problems in each chapter in the SAP PKLH flow. From the results of the data description analysis, this is in line with the results of Yulianto's research showing that aspects of connectedness and aspects of learning in online learning using WhatsApp group by applying the concept of Community of Inquiry, namely in communicating in recovery activities between lecturers and students through existing facilities on WhatsApp media. This is where students perceive it to be higher than using the Zoom webinar to be used in online learning during the pandemic Covid-19 [13].

In the results of scientific communication research where the average score in each scientific communication process: a. The presentation of the problem from the information source obtained was an average score of 80 or about 50 percent of the students were able to analyze the problem from the information source and then presented the problem. b. Discussion on existing problems based on the
information obtained is an average score of 80 or about 63.3 percent of students are able to discuss from starting to answer the problems that occur to the analysis of the possibilities that will occur related to the problems made, namely the theme of the outbreak. Covid-19 is reviewed from each chapter in SAP PKLH. c. scientific reporting, with an average score of 75.83 or about 63.3 percent based on a series of scientific method activities and then reported in the form of scientific papers. At this reporting level students already have a lot of literature review and library analysis based on activities that have been made from analyzing, presenting and discussing problems so that the preparation of reports on results in the form of scientific papers enters a valid and significant stage for answers to problems that are answered in each activity of the scientific communication process.

The results of research conducted by researchers are in line with the results of Nana's research that the results of scientific communication in learning, namely the achievement of the 1st aspect, namely compiling and submitting reports systematically and clearly increased by 10.15%. The achievement of the second aspect is explaining the experimental results increased by 6.98%. The achievement of the third aspect, namely discussing the results of the experiment, increased by 7.38%. The achievement of the fourth aspect, namely classifying and compiling data, increased by 7.73%. The achievement of the fifth aspect is describing the data in tables, diagrams or graphs of 4.23%\(^{[10]}\). Furthermore, the results of this study are in line with Eliyasni's research analysis, which states that blended learning can improve the quality of learning to seek information and knowledge based on real experiences, resulting in products where students make decisions through a systematic framework, have problems with unlimited solutions and require students to design processes. learning activities where blended learning and project based learning also emphasize increasing students' Higher-Level Thinking Skills (HOTS)\(^{[12]}\).

Then from the analysis of the research results, testing the ability to think creatively is taken from the research report or observation of a problem that has been given to each group based on the problems in each SAP PKLH chapter then the problems in each SAP PKLH chapter are made a scientific paper report whose report is made by each individual. The ability to think creatively shows that the average scientific writing report is at a good or moderate level. Where the average score at the level of the assessment score is 3 or good. At the indicator stage of the ability to think creatively, namely the aspect of fluency, flexibility in thinking, originality, elaboration and evaluation, students are able to correctly and well in compiling scientific paper reports. This shows that the ability to think creatively is generated from the higher order thinking learning process (HOTs). In other words, learning using higher order thinking skills (HOTs) results in an increase or change in the ability to think creatively.

From the results of research that has been conducted by researchers in testing creative thinking skills in line with Jailani's research results, that the implementation of problem-based learning will produce:
a. High-order thinking skills (HOTs) and character, the characters formed by students produce higher-order thinking skills (HOTs) in the form of creativity because the teacher provides material in the form of problems that are solved in high-order thinking (HOTs), namely creative. b. in learning discussions and presentations it is more effective because the learning process (input) is achieved\(^{[5]}\). From the results of the research that has been done, it is clear that learning using HOTs in measuring higher-order thinking skills in order to produce creative thinking abilities gets good or positive results through a series of processes from starting to present, discussing and reporting the results of the problems given produces excellent input.

4. Conclusion
Based on the results and discussion of the research, it can be concluded that HOTs learning with WhatsApp media in measuring scientific communication skills and creative thinking skills leads to positive changes where students are invited or led to carry out the learning process by way of higher-order thinking to find solutions or answers to a problem given.

References
[1] Novianto, Iik. 2013. Perilaku Penggunaan Internet Di Kalangan Mahasiswa (Studi deskriptif tentang perilaku penggunaan internet dikalangan mahasiswa perguruan tinggi negeri (FISIP
UNAIR) dengan perguruan tinggi swasta (FISIP UPN) untuk memenuhi kebutuhan informasinya). Tesis, Universitas Airlangga. http://repository.unair.ac.id

[2] Sahidillah, Muhammad Wildan; Prarasto Miftahurrisqi. 2019. Whatsapp Sebagai Media Literasi Digital Siswa. Varia Pendidikan, Vol. 31, No. 1, Juni 2019: 52-57

[3] Yusmita, Mei; Zulfiah Larisu; Saidin. 2018. Pemanfaatan Whatsapp Messenger Sebagai Media Komunikasi Antar Pribadi Mahasiswa Ilmu Komunikasi. Jurnal Ilmu komunikasi UHO : Jurnal Penelitian Ilmu Komunikasi dan informasi, Vol.3, No.4 (2018)

[4] Wahid, Abd Hamid; Rizka Afkarina Karimah. 2018. Integrasi Higher Order Thinking Skill (Hots) Dengan Model Creative Problem Solving. Modeling: Jurnal Program Studi PGMI, Volume 5, Nomor 1, Maret 2018; p-ISSN: 2442-3661; e-ISSN: 2477-667X, 82-98

[5] Jailani, J; S. Sugiman; Ezi Apino. 2017. Implementing the Problem-Based Learning in Order to Improve the Students’ HOTS and Characters. Jurnal Riset Pendidikan Matematika 4 (2), 2017, 247-259.http://journal.uny.ac.id/index.php/jrpm

[6] Putra, Tomi Tridaya; Irwan; Dodi Vionanda. Meningkatkan Kemampuan Berpikir Kreatif Siswa Dengan Pembelajaran Berbasis Masalah. Jurnal Pendidikan Matematika, Part 3: Vol. 1 No. 1 (2012), Hal. 22-26

[7] Suparman, Dwi Nastuti Husen. 2015. Peningkatan Kemampuan Berpikir Kreatif Siswa Melalui Penerapan Model Problem Based Learning. Jurnal BIOeduKASI, Vol 3 No (2) Maret 2015

[8] Purnamaningru, Arifah; Sri Dwistuti; Riezyk Maya Probosari; Noviawati. 2012. Increasing Of Student’s Creative Thinking Through Implementation Of Problem Based Learning (PBL) At Biology Subject Learning In Class X-10 SMA Negeri 3 Surakarta In 2011/2012. Pendidikan Biologi : Volume 4, Nomor 3 September 2012 Halaman 39-51

[9] Fardah, Dini Kinati. 2012. Analisis Proses dan Kemampuan Berpikir Kreatif Siswa dalam Matematika Melalui Tugas Open-Ended. Jurnal Kreano, Jurusan Matematika FMIPA UNNES, Volume 3 Nomor 2 Desember 2012

[10] Nana, Hadi Pramono. 2019. Upaya Peningkatan Kemampuan Kognitif dan Komunikasi Ilmiah Siswa Kelas X MIA I SMA Negeri 1 Ciamis Menggunakan Model Pembelajaran Inquiry. Diffraction, vol. 1(1) 2019

[11] Sugarti, E; H. Susanto; S. Khanafiyah. Pengaruh Model Pembelajaran Inquiry Berbasis Metode Pictorial Riddle Terhadap Kemampuan Berkomunikasi Ilmiah Siswa SMP. Unnes Physics Education Journal: Vol. 4 (3) (2015)

[12] Eliyasni, Rifida; Ary Kiswanto Kenedi; Inaad Mutlib Sayer. 2019. Blended Learning and Project Based Learning: The Method to Improve Students’ Higher Order Thinking Skill (HOTS). Jurnal Iqra’ : Kajian Ilmu Pendidikan 4(2): 231–248, December 2019

[13] Yulianto, Eko; Patri Dwi Cahyani; Sofia Silvianita. 2020. Perbandingan Kehadiran Sosial dalam Pembelajaran Daring Menggunakan Whatsapp group dan Webinar Zoom Berdasarkan Sudut Pandang Pembelajaran Pada Masa Pandemic COVID-19. Jurnal Riset Teknologi dan Inovasi Pendidikan (JARTIKA), Vol. 3 No. 2 (Juli) 2020, Hal. 331 -341