BUKTI KORESPONDENSI ARTIKEL

PADA JURNAL INTERNASIONAL BERREPUTASI

(Jurnal Pendidikan IPA Indonesia: JPII)

PENGUSUL

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Yth. Penilai Pada Usulan PAK

Bersama dengan surat ini, saya bermaksud menyertakan bukti bukti korespondensi proses review artikel pada Jurnal Internasional berreputasi dengan judul: **"Analysis of The Role of Android-Based Learning Media in Learning Critical Thinking Skills and Scientific Attitude",** dimuat pada Jurnan Pendidikan IPA Indonesia (JPII), edisi Vol. 10, No. 4, tnggal publikasi 31 Desember 2021, p-ISSN: 2339-1286, e-ISSN: 2089-4392, halaman: 607-617, Penerbit: UNNES Journals Indonesia.

Kronologi bukti korespondensi terdiri dari 20 aktivitas pada tabel di bawah ini

No	Tanggal	Uraian Aktivitas
1	07-12-2020	Submit manuskrip pada jurnal melalui online
2	07-12-2020	Memperoleh pemberitahuan bahwa kemajuan artikel jurnal dapat diikuti melalui OJS (the online journal management system. Memperoleh URL Manuskrip dan User name. Manuscript URL: https://journal.unnes.ac.id/nju/index.php/jpii/author/submission/27597 Username: wiwi-isnaeni
3	08-12-2020	Menerima ucapan terima kasih atas submisi artikel yan saya lakukan
4	22-10-2021	Memperoleh pesan bahwa artikel dalam proses review; Tim JPII mengirimkan blangko Letter of Statement yang harus di tanda tangani.
5	23-10-2021	Author menanda tangani surat pernyataan dan mengirimkan Letter of Statement yang sdh di tandatangani ke Tim Jurnal;
6	25-10-2021	Penerima permintaan mengirimkan naskah artikel berbahasa Indonesia kepada (Chief Editor/Tim Jurnal), paling lambat 27 Okt.
7	26-10-2021	Mengirimkan artikel berbahasa Indonesia via Email dalam format MS Word (oleh Penulis Utama) dan Letter of Statement yang telah di tanda tangani.
8	27-10-2021	Mengirimkan artikel berbahasa Indonesia format pdf dan Letter of Statement yang telah ditanda tangani.
9	02-11-2021	Menerima pemberitahuan **hasil review pertama** telah diunggah di OJS; Author diminta merevisi artikel, dan mensubmit hasil revisi paling lambat tanggal 5 November 2021; Submit artikel **hasil revisi pertama** pada tanggal 5-11- 2021. Hasil revisi pertama disubmit dalam dua versi, yaitu versi Bahasa Indonesia dan Bahasa inggris.
10	10-11-2021	Pemberitahuan hasil evaluasi terhadap artikel hasil revisi pertama; Artikel diterima dan akan dipublikasikan pada edisi Desember 2021;
11	1-12-2021	Menerima pesan untuk merevisi artikel dengan cara memeriksanya di OJS, dan mensubmit artikel hasil revisi (**revisi kedua**) di OJS paling lambat 5 -12-2021; mensubmit artikel hasil revisi kedua pada tanggal 6-12-2021
12	08-12-2021	Menerima pesan untuk merevisi artikel dengan cara memeriksanya di OJS, dan mensubmit artikel hasil revisi (**revisi ketiga**) di OJS paling lambat 14 Desember 2021. Artikel yang dikirim hanya menggunakan bahasa Inggris.
13	15 -12-2021	Menerima pemberitahuan tentang penerimaan artikel **paska revisi ketiga**, rencana jadwal publikasi, dan perlunya proofreading artikel pada lembaga professional, serta memeriksa similarity (cek Turnitin) terhadap artikel ini. Hal di atas harus disubmit tanggal 19-12-2021.

14	21-12-2021	Tim jurnal menginformasikan bahwa ada beberapa kutipan yang sumbernya tidak disebutkan di bagian referensi, dan ada beberapa sumber dalam referensi yang tidak disebutkan dalam artikel. Perlu memperhatikan tabel dan urutan gambar. 1. Setiap gambar/tabel didahului dengan pengenalan deskripsi, dan setelah gambar/tabel diberikan deskripsi hasil yang ditampilkan. 2. Gambar/tabel tidak boleh berurutan. Hasil revisi (**revisi keempat**) disubmit paling lambat 23-12-2021. Mensubmit **hasil revisi keempat** pada tanggal 23-12-2021.
15	23-12-2021	Menerima pesan untuk: 1. memeriksa pernyataan keaslian dan surat pernyataan, menanda tangani surat-surat tersebut, dan mengunggah pada akun OJS sebagai berkas pelengkap; 2. Unggah laporan Turnitin di akun OJS 3. melengkapi juga semua nama penulis Anda di metadata OJS.
16	24-12-2021	Pengiriman LoA
17	30-12-2021	Menerima pesan untuk memeriksa keadaan artikel setelah proses lay out oleh Tim JPII (pengecekan akhir sebelum publish / **revisi kelima)**
18	31-12-2021	Submit artikel final kepada Tim JPII via OJS
19	10-01-2022	Pemberitahuan dari Tim JPII bahwa artikel telah Publish di Web, dan meminta author melakukan pemeriksaan terakhir terhadap keadaan artikel (**revisi keenam**).
20	12-01-2022	Author mengirimkan hasil pemeriksaan terakhir kepada Tim JPII

Demikian, agar dapat menjadi periksa.
Terimakasih

Semarang, 6 Juni 2022
Hormat saya,

Dr. Wiwi Isnaeni, M.S.

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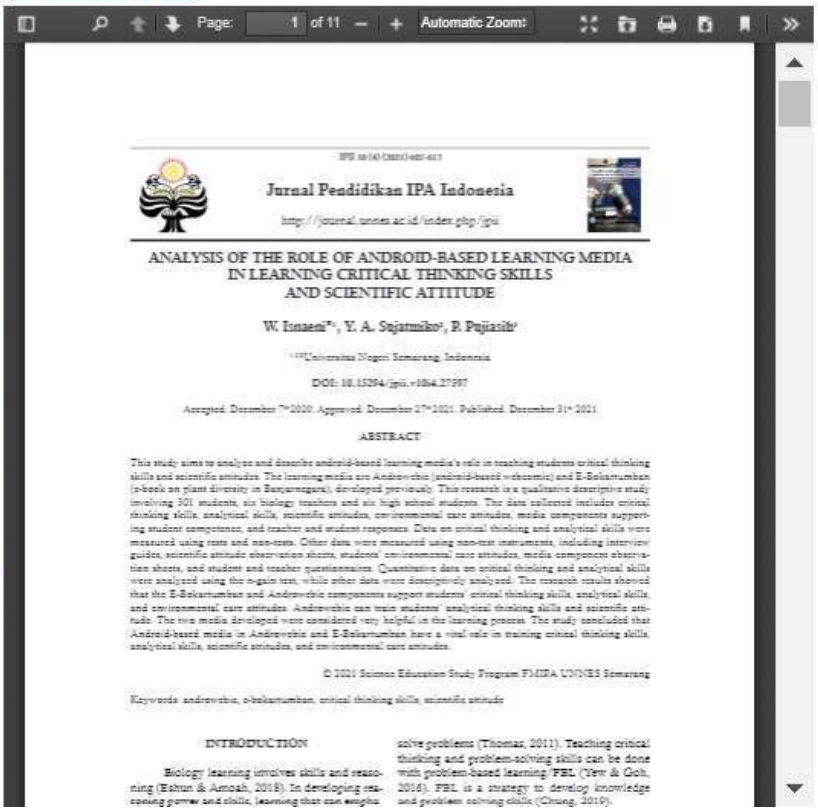

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ANALYSIS OF THE ROLE OF ANDROID-BASED LEARNING MEDIA IN LEARNING CRITICAL THINKING SKILLS AND SCIENTIFIC ATTITUDE

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ABSTRACT

This study aims to analyze and describe android-based learning media's role in teaching students critical thinking skills and scientific attitudes. The learning media are Androvirbio (android-based virbiomic) and E-Bekatumbun (e-book on plant diversity in Banjarnegara), developed previously. This research is a qualitative descriptive study involving 301 students, six biology teachers and six high school students. The data collected includes critical thinking skills, analytical skills, scientific attitudes, environmental care attitudes, media components supporting student competence, and teacher and student responses. Data on critical thinking and analytical skills were measured using tests and non-tests. Other data were measured using non-test instruments, including interview guides, scientific attitude observation sheets, students' environmental care attitudes, media component observation sheets, and student and teacher questionnaires. Quantitative data on critical thinking and analytical skills were analyzed using the n-gain test, while other data were descriptively analyzed. The research results showed that the E-Bekatumbun and Androvirbio components support students' critical thinking skills, analytical skills, and environmental care attitudes. Androvirbio can train students' analytical thinking skills and scientific attitude. The two media developed were considered very helpful in the learning process. The study concluded that Android-based media in Androvirbio and E-Bekatumbun have a vital role in training critical thinking skills, analytical skills, scientific attitudes, and environmental care attitudes.

Keywords: androvirbio, e-bekatumbun, critical thinking skills, scientific attitude

INTRODUCTION

Biology learning involves skills and reasoning (Ekhun & Amoah, 2018). In developing reasoning power and skills, learning that can employ

solve problems (Thomas, 2011). Teaching critical thinking and problem-solving skills can be done with problem-based learning/ PBL (Yew & Goh, 2016). PBL is a strategy to develop knowledge and problem solving skills (Chung, 2019).

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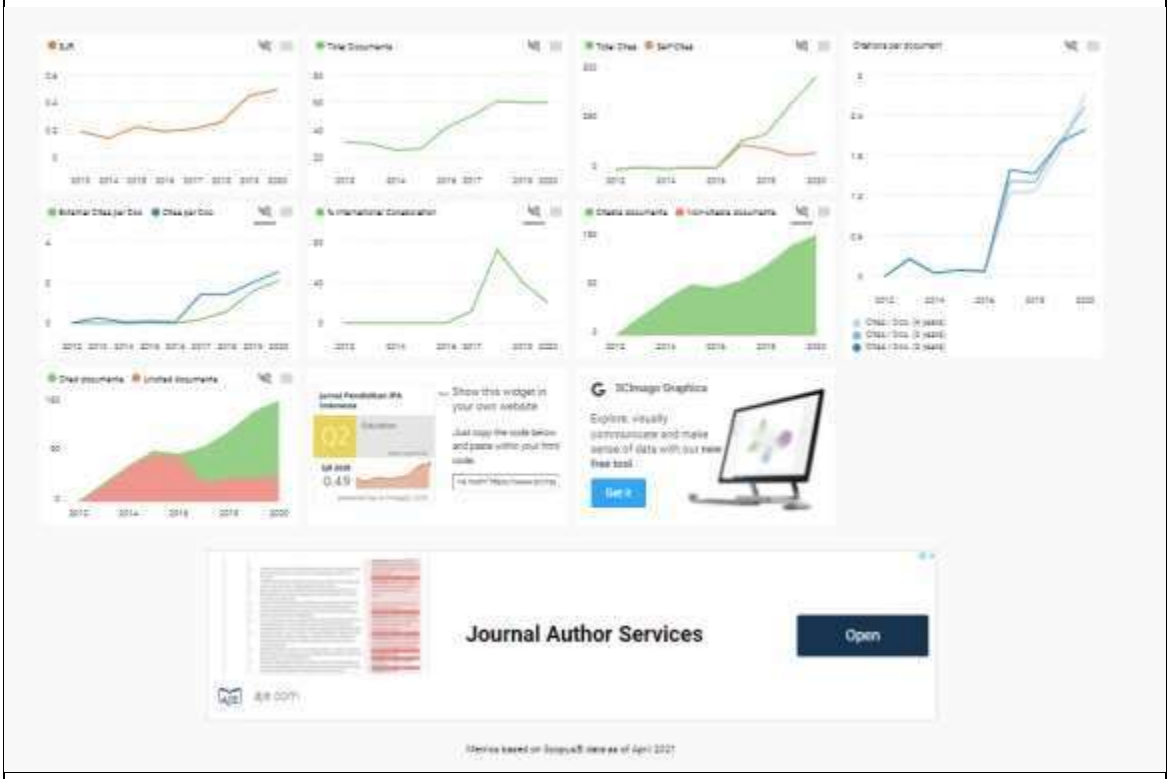
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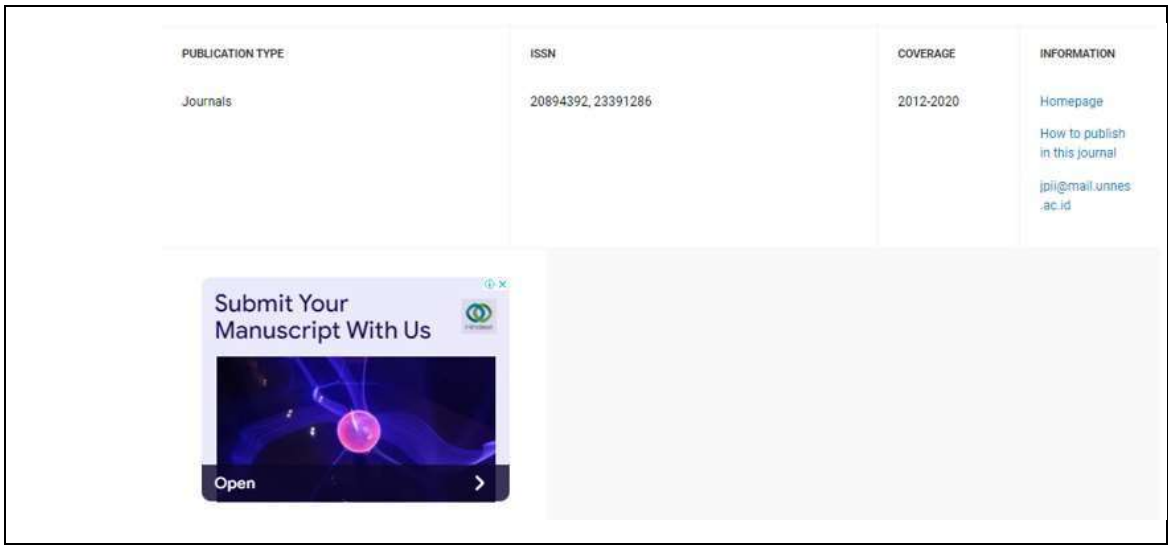

KRONOLOGI KORESPONDENSI PUBLIKASI ARTIKEL PADA JURNAL INTERNASIONAL BEREPUTASI DAN BERFAKTOR DAMPAK (JPII)

No.	Tanggal	Uraian Kegiatan
1	07 Des 2020	**Submit manuskrip pada jurnal melalui online Manuskrip yang di submit disajikan pada halaman 6 – 13 pada berkas ini.**
2	07 Des 2020	**Memperoleh respon dari Chief of Editor, Parmin.** Memperoleh pemberitahuan dari Chief of Editor bahwa kemajuan artikel jurnal dapat diikuti melalui OJS (the online journal management system. Memperoleh URL Manuskrip dan User name. URL Manuscript: https://journal.unnes.ac.id/nju/index.php/jpii/author/submission/27597 Username: wiwi-isnaeni
3	08 Des 2020	**Menerima ucapan terima kasih atas submisi artikel yang saya lakukan**

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POTENTIAL ANALYSIS OF THE ANDROID-BASED LEARNING MEDIA AS A MEANS TO TRAINCRITICAL THINKING SKILLS AND SCIENTIFIC ATTITUDES

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ABSTRACT

This study aimed to analyze and describe the potential of Android-based learning media to train students' critical thinking skills and scientific attitudes. The learning media were Andro-Webcomic (called Androwebic) and E-Booklet of plant diversity in Banjarnegara (abbreviated as E-Bokartumban). This research was a pre-experimental research, the type of One Group Pretest-Posttest Design. The research subjects included 196 students of grade X from three high schools in Banjarnegara and 105 students of grade XI from threehigh schools in Jepara. The sample was determined using purposive sampling technique. The data collected included critical thinking skills, students' scientific attitudes, and teacher and student responses. The instruments used were test & non-test sheets, interview sheets, observation sheets for students' scientific attitudes and environmental care, and student and teacher response questionnaires. Data was analyzed using qualitative descriptive statistics and quantitative (n-gain test). The results showed that: (1) E-Bokartumban media had supporting component in facilitating competence of analytical thinking and caring for the environment. Androwebic media was able to train 92.38% analytical thinking skills, and scientific attitude of 85.66%. (2) Student and teacher responses to Androwebic were 89.59% & 87.36%. Conclusion: Android-based media in form of Androwebic and E-Bokartumban has the potential to train critical thinking skills, environmental care, analytical thinking skills, and scientific attitudes.

Keywords: androwebic; e-bokartumban; critical thinking skills; scientific attitude

INTRODUCTION

Biology learning involves skills and reasoning (Amoah & Emmanuel, 2018). In developing reasoning power and skills, learning is needed that can emphasize the aspects of application, analysis, synthesis, and evaluation, not only emphasizing aspects of understanding and knowledge. For this reason, a learning process is needed that can improve cognitive, affective, psychomotor competencies, as well as learning methods that can motivate students to be creative, confident, and think critically (Pujiasih et al., 2020). Basically, students have the ability to think critically in learning, but this ability sometimes does not develop properly. Therefore, it is necessary to use methods that are able to develop students' critical thinking skills. Students who have critical thinking skills will find it easy to analyze, evaluate, and be able to relate to evidence or arguments, before deciding or assessing information (Mutakinati et al., 2018). In learning process, students' critical thinking skills play an important role in achieving learning achievement, formal reasoning, and creativity (Puspita et al., 2017).

Biology learning in schools is still dominated by textbooks and modules with a few pictures, and learning is still teacher-centered. This causes the students 'mindset to be limited, and the students' understanding of

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biology concepts weakens, so that their critical thinking skills and scientific attitudes are still weak. This statement was strengthened by the results of interviews by several teachers of SMA/MA in Banjarnegara and Jepara. The information obtained from the interviews included: (1) The learning had not made optimal use of student-centered media; (2) Students were allowed to bring smartphones but it had not been well utilized; (3) Teachers had not used technology (smartphones) as a tool or media that could support learning; (4) limited learning time.

Based on the results of interviews with the teacher, it could be concluded that these problems could be minimized by utilizing technology owned by students, and making maximum use of student-centered learning in the learning process. In this case, there were subject matter that needs to be taught using learning media, including material on the circulatory system and material on biodiversity systems. The choice of circulatory system material was because it had a complicated concept, so it needed to be presented in an attractive manner. Then, the selection of material on biodiversity systems was very necessary to optimize electronic media that could make it easier for students to present diversity in the classroom.

The availability of learning media will facilitate interaction between teachers and students so that learning activities will be more effective and efficient (Puspitasari et al., 2018). The existence of learning media can facilitate ease of learning, foster interest in learning, and facilitate independent learning for students so that the learning process will be more effective (Surjanti et al., 2018). The use of android media can make students more interested in learning. Students are also more interested in using pictorial technology as opposed to using textbooks. Taking this into account, it is clear that there is an urgent need to optimize modern technology to be used as a learning media.

Based on the existing problems, it is clear that current research is needed to optimize learning media that can visualize learning material appropriately. The media should have a simple structure that focuses on one goal. Learning media that are expected to be useful (good) to overcome the learning problems mentioned before is media that is easy to carry and use anywhere. One of these media is android based media. The android-based media referred to in this article is presented in form of an e-booklet about the diversity of plants in Banjarnegara (named E-Bokartumban), and the circulatory system webcomic (named Androwebic). The media is expected to improve students' critical thinking skills and scientific attitudes.

Based on the problems above, the following questions can be formulated:

- How to improve students' critical thinking skills and scientific attitudes in biology learning using Android-based learning media?
- How do students and teachers respond to biology learning using Android-based learning media?

METHOD

Types of research

The type of research used in this research was pre-experimental, with a one group pretest-posttest design (Sugiyono, 2015).

Research Samples

The samples (subjects) of this study were 196 students of grade X from three high schools in Banjarnegara and 105 students of grade XI students from three high schools in Jepara. The sample/research subject was selected by using purposive sampling technique.

Research Data and Instruments

The data collected included data on critical thinking skills, student scientific attitudes, and teacher and student responses about Android-based media used in biology learning. The research instruments used included test and non-test sheets; interview sheet; observation sheet for students' scientific attitudes and environmental care; as well as student and teacher response questionnaire sheets. Test sheets (pretest and posttest) were used to measure the improvement of students' critical thinking skills and analytical thinking skills. The non-test sheet in form of an observation sheet is used to determine the scientific attitude and environmental care attitudes of students.

Data analysis

The data analysis technique in this study used descriptive qualitative and quantitative statistical methods. The data analysis techniques were (1) n-gain test to

analyze data on students' critical thinking skills and analytical thinking skills; (2) qualitative analysis techniques were used to analyze data on scientific attitudes, environmental care for students, as well as data on the implementation of the learning process, and the responses of teachers and students regarding Android-based media used in Biology learning.

RESULTS AND DISCUSSION

Students' Critical Thinking Skills and Scientific Attitudes

Androwebic's role in learning Biology

Data on students' critical thinking skills and scientific attitudes in learning using Android-based media (Androwebic and E-Bokartumban) were obtained from test results (pretest and posttest) and non-test. Student learning outcomes in learning using Android-based media (Androwebic and E-Bokartumban) are presented in Table 1, Table 2, Table 3, Table 4, Table 5, Table 6, and Table 7.

Tabel 1. Students' Pretest andPosttest Score in Biology Learning Using Androwebic Media

Information	*Pretest Score* (n=105)	*Posttest Score* (n=105)
Highest score	93.33	100
Lowest score	13.33	60
Average value	53.65	88.83
Number of students completed	11	97
Number of students is not complete	94	8
Classical completeness%	10.48	92.38

Table 1 shows that there is a significant difference between the pretest and posttest scores obtained by students. The pretest results shows an average value of 53.65. This score is still less than the KKM, which has not reached the score of 75. The posttest score achieved by students averaged 88.83 (having exceeded the KKM by 75).

The improvement of students' analytical thinking skills was obtained from the results of the n-gain test on the pretest and posttest scores achieved by students. The results of the n-gain test are presented in Table 2

Table 2. The Results of N-Gain Test for Students' Analytical Abilities after Learning Process Using Androwebic Media

N	Percentage Category N-Gain (%)		
	High	Moderate	Low
105	72	24	4

From Table 2 it is known that most students achieved a high category increase. From these data it can also be stated that almost all students achieve an increase in critical thinking skills in the moderate to high category. The results of the analysis indicate that Biology learning using Androwebic media is effective in improving students' analytical abilities.

Androwebic media has such potential because it is equipped with various discussion questions that contain problems in the context of everyday life. This can stimulate students' curiosity and encourage students to practice solving problems. Both activities require analytical thinking skills, so that students' abilities in this matter are properly trained. This is in accordance with the research of Prawita et al. (2019) and Sari et al. (2019) which stated that the use of learning media that presents problems can improve learning outcomes and analytical thinking skills in students.

During the discussion stage in learning using Androwebic media, students are directed to discuss with each other and exchange ideas about problem solutions systematically and logically. Thus students become trained to think analytically. This is in accordance with the statement of Sari et al. (2019) which proved that learning by actively involving students to solve problems can improve analytical thinking skills and student learning outcomes.

Information about students' scientific attitudes in learning using Androwebic media was obtained from the observation process using student scientific attitude observation sheets. Androwebic media was created specifically, in such a way that it had a number of useful facilities for practicing 6 aspects of a scientific attitude (see Table 3). The results of

observations of students' scientific attitudes during the learning process using Androwebic media are presented in Table 3.

Table 3. Scores of Students' Scientific Attitudes During The Learning Process Using Androwebic Media

Indicator	Σ Score	Max Score	Score (%)	Criteria
Attention to every new thing	1086	1260	86.19	Very good
Appreciate and draw conclusions according to facts	1056	1260	83.81	Very good
Not always fell right, changing opinion after considering the evidence	1035	1260	82.14	Very good
Ask questions and give opinions	1124	1260	89.21	Very good
Participate in groups	1107	1260	87.86	Very good
Record complete observations	1068	1260	84.76	Very good
Average of each aspect			85.66	Very good

In Table 3, it can be seen that the average scientific attitude of students is in very good category. This happens because since the beginning of the learning process, students were always motivated to learn and seek information independently, so that during the learning process in the classroom students showed a more attentive, respectful attitude, drawn conclusions according to facts. During the learning process, students were also accustomed not to feel always right, dared to ask questions, dared to express opinions, be active in groups, and recorded complete observations. In the learning process students must solve discussion questions that contain contextual problems. Every activity carried out during the discussion process made a positive contribution to the formation of a scientific attitude. This is what can encourage students to think analytically in solving problems. This is in accordance with the statement of Dwianto et al. (2017) that the application of learning media that presents contextual problems through discussion can make a positive contribution to the formation of scientific attitudes in student.

The role of E-Bokartumban in Biology learning

E-Bokartumban media hada components that could support in faciliating the competence of critical thinking skills and evironmental care attitudes presented in Table 4.

Table 4. E- Bokartumban Media Components that facilitate critical thinking skills competencies

No.	Aspects and Indicators	Media Components
	Critical thinking skills	
1	Give a simple explanation	Evaluation questions onthe media, students discussion sheets
2	Build basic skills	Evaluation questions onthe media, students discussion sheets
3	Conclude	Evaluation questions onthe media, students discussion sheets
4	Identify terms and consider a definition	Evaluation questions onthe media, students discussion sheets
5	Set strategy and tactics	Evaluation questions onthe media, students discussion sheets

Table 4 shows the media E-Bokartumban has a component that has a function for each competency that exist in the research of this research. According to Ennis in Goal for A Critical Thinking Curriculum is presented in journal Kartimi and Liliasari (2012), there are five stages of thinking with each indicator, that are Giving simple explanation, Building basic skills, Summing up, Identifying terms and considering a definition, Setting strategies and tactics. This indicators of thinking can be measured when the students do the worksheets discussion and evaluation questions that exist in the media. Wiguna et al. (2019) and Damopolil & Kurniadi (2019) which explains about the case

of improving student learning outcomes after following the process of learning that implement Android-based media. Arista & Kuswanto (2018) stated that media that can be operated using a smartphone can increase enthusiasm, interest, and motivation in learning activities. All things that can enhance independence and understanding of concepts in students .

Table 5. E- Bokartumban Media Components that facilitate thencompetence of Environmental care attitudes

No.	Aspects and Indicators	Media Components
	Environmental Care Attitude	
1	have thought that plants and animals have rights were equal to hu mans	Introduction to the material
2	have feelings / emotions about human actions that cause disaster	Introduction to the material
3	have thinking that the environment is very fragile and easily disturbed balance	Student discussion sheets, material on the media
4	have feelings and tendencies of behavior that the tendency of human beings there is a limit in controlling nature	Student discussion sheets, material on the media
5	have a tendency of behavior to take advantage of the source power of nature that has been used	Student discussion sheets, material on the media
6	have a tendency of behavior not to be arbitrary towards the environment	Student discussion sheets, material on the media
7	have thoughts and attracted in environmental issues	Student discussion sheets, material on the media
8	have emotional feelings about actions that can cause environmental damage	Student discussion sheets, material on the media

From Table 5 can be known the indicators of environmental care attitudes that used scale that was adapted from NEPS case of aspects, 1) have thought that plants and animals have rights were equal to humans , 2) have the feeling / emotional against the actions of man that cause disasters , 3) have thinking that the environment is very fragile and easily disturbed balance, 4) have feelings and the tendencies of behavior that the tendency of human beings there is a limit in controlling nature, 5) have a tendency of behavior to take advantage of the source power of nature that has been used , 6) have a tendency of behavior for not arbitrarily towards the environment, 7) has thoughts and attracted in environmental issues , and 8) have emotional feelings about actions that can cause environmental damage, can be measured as long as students using the media to read the material and when the process of discussion groups take place in learning process.

Learning with media E-Bokartumban acan make a positive contribution in improving students' attitudes environmental care. Environmental care is an attitude and actions that always try to prevent damage to the surrounding natural environment and develop efforts to repair natural damage (Yaumi, 2014). An attitude of caring for the environment can be demonstrated by attitudes and actions that always try to prevent environmental damage and seek to repair natural damage that has occurred (Mardikaningtyas, 2016).

Based on the description in the paragraph above, can be stated that the use of media android-based learning is very effective to enhance students' understanding. This is in accordance with the opinion of Sudarsana et al. (2019) which stated that the use of technology-based learning media can improve student learning outcomes. Junaedi et al. (2018) and Damopolil & Kurniadi (2019) find that learning by applying android-based media can improve students' learning outcomes . Learning process that using technology can increase student interest and learning outcomes (Sudarsana et al., 2019). Wiguna et al. (2019) and Damopolil & Kurniadi (2019) reported the case of improving student learning outcomes after follow learning that implement Android-based media. This statement is also accordance with the explanation of Jeno et al. (2017), that stated the process of learning that uses Android-based media can improve student learning outcomes.

Results of Student and Teacher Responses to Learning Using Android-Based Biology Learning Media

Student and teacher responses to the learning process using Androwebic media

Student responses to learning using Androwebic media were obtained from

student response questionnaires given at the end of the lesson. Information about students' positive responses to Androwebic media is presented in Table 6.

Table 6. Results of Student Responses to Androwebic Media

Indicators	Score Obtained	Max. Score	Percentage (%)	Criteria
Affective consideration	755	840	89.88	Very good
Learning	1116	1260	88.57	Very good
Multimedia display	2308	2520	91.59	Very good
Navigation	1487	1680	88.51	Very good
Robustness	1507	1680	89.40	Very good
Average			89.59	Very good

The data in Table 6 shows that the average of each aspect/indicator shows very good criteria. In some aspects, the student's response rate shows the maximum score. This showed that students were interested and motivated to learn with comics in the media. Apart from being interested and motivated by comics, students also admitted that the material equipped with pictures on Androwebic media was very helpful and made it easier for students to learn, because it was summarized in a structured manner. The problems presented in Androwebic media are also problem-able to provide the right visualization. This makes it easier for students to understand abstract about the circulatory system. The use of appropriate learning media and in accordance with the character of students in learning, can help students to find concepts in context. The media in question must be interesting, contain extensive learning resources, contain information that is presented with visual images.The use of a problem-based learning approach that is complemented by the use of learning media is proven to be able to based learning oriented which can increase student activity in learning activities. In the learning process, students not only listened, but also tried, found, and concluded. Therefore, students' understanding, analytical thinking skills, and scientific attitudes will be higher.

In terms of appearance, Androwebic media received high points, with very good criteria. This showed that students were very interested in the appearance of Androwebic media. Androwebic media is equipped with images on every detail of the material, so that it is circulatory material. Androwebic media can also help students understand and discover concepts foster student interest and motivation to be more active in learning so as to create enjoyable learning, understanding the circulatory system material will increase (Maulana & Sulistyoningrum, 2018; Lee et al., 2015).

The level of positive response from the teacher to the implementation of the learning process using Androwebic media, obtained from the teacher's responses are presented in Table 7.

Table 7. Levels of Teacher's Positive Response to Androwebic Media

Indicators/aspects	Score Obtained	Max. Score	Percentage(%)	Criteria
Affective consideration	22	24	91.67	Very good
Learning	30	36	83.33	Very good
Multimedia display	64	72	88.89	Very good
Navigation	41	48	85.42	Very good
Robustness	42	48	87.50	Very good
Average			87.36	Very good

From the data in Table 7, it is known that the average score for each aspect is 87.36%, with the very good category. The teacher said that Androwebic media was very good, easy to use, up to date, the material presented was equipped with attractive visuals, could be used anytime and anywhere with the condition of using an android device. This confirmed by Sung et al. (2016) which stated that the use of Android devices such as smartphones in learning is better and more effective than conventional learning. Students are more enthusiastic because the learning process is student-centered, while the teacher only directs and guides. This is in accordance with the findings of Ali (2019) which proved that student-centered learning will improve students' ability to understand the material

being studied and the ability to solve problems. In such circumstances, the teacher is sufficient to direct and guide as needed.

Student and Teacher Responses to The Learning Process Using E-Bokartumban Media

Media E-Bokartumban was used in this study is able to assist students in building material concept of biodiversity. Teachers also gave feedback positively on the activities of students in learning, because it made students becoming very enthusiastic when they hold discussions. The teacher said that the E-Bokartumban media was attractive, contemporary, easy to use, easy to carry, and the material presented was very clear.

Based on the results of data analysis, obtained information that the media Androwebic can train analytical thinking skills in students by 92.68% and scientific attitudes of 85.66%. Android-based media taken as positive by students and teachers. Levels of positive responses from students and teachers to the media media Androwebic of 89.59% and 87.36%. Based on that it can be concluded that the media Androwebic and E-Bokartumban were used in Biologylearning was very potential to train critical thinking skills and scientific attitudes of students.

CONCLUSION

Two types of media based on Android, namely Androwebic and E-Bokartumban, which were used in biology learning had proven potential to train high school students' critical thinking skills and scientific attitudes.

The authors would like to thanks Prof. Dr. Enni Suwarsi Rahayu, M.Si., and Prof. Dr. Retno Sri Iswari, S.U., as the material expert validator, Dr. Budi Naini Mindayarto, M.App.Sc., and Mohammad Fikri, S.Sn (Pusdatin Kemendikbud) as media expert validators who have provided very useful suggestions for improving this research. This research was supported by the Lembaga Penelitian dan Pengabdian Masyarakat Universitas Negeri Semarang, which has funded this research.

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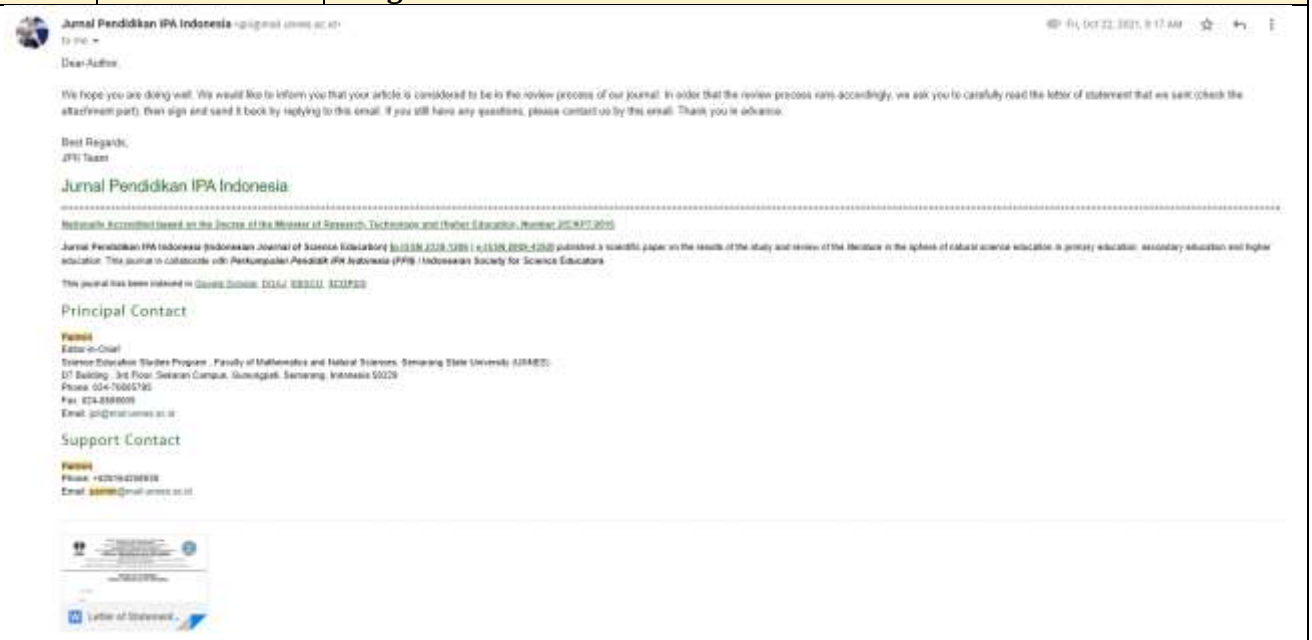
4	**22 Okt 2021**	**Memperoleh pesan bahwa artikel dalam proses review; Tim JPII mengirimkan blangko Letter of Statement yang harus di tanda tangani.**



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We hope you are doing well. We would like to inform you that your article is considered to be in the review process of our journal. In order that the review process runs accordingly, we ask you to carefully read the letter of statement that we sent (check the attachment part), then sign and send it back by replying to this email. If you still have any questions, please contact us by this email. Thank you in advance.

Best Regards,
JPII Team

Jurnal Pendidikan IPA Indonesia

Principal Contact

Support Contact

5	**23-10-2021**	**Author menanda tangani surat pernyataan dan mengirimkan Letter of Statement yang sdh di tandatangani ke Tim Jurnal;**

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UNIVERSITAS NEGERI SEMARANG
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF INTEGRATED SCIENCES
IN COLLABORATION WITH PERKUMPULAN PENDIDIK IPA INDONESIA

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LETTER OF STATEMENT
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I, as Author,

Name : Wiwi Isnaeni

WhatsApp number : +628122883070

Article entitled : ANDROID-BASED LEARNING MEDIA POTENTIAL ANALYSIS AS A MEANS TO TRAIN CRITICAL THINKING SKILLS AND SCIENTIFICÄ ATTITUDES

or (an alternative title)

POTENCIAL ANALYSIS OF THE ANDROID-BASED LEARNING MEDIA AS A MEANS TO TRAIN CRITICAL THINKING SKILLS AND SCIENTIFIC ATTITUDES

Declaring that we are willing to fulfill the following article administration requirements:

1. revise the article according to the set time limit;
2. proofread the article from an official, reliable, and professional institution **after the review process is completed,** and provided an official letter or certificate of the proofread;
3. pay the publication fee amounting to Rp 4.000.000 **after receiving the bill from us**, and complete the payment within 2 weeks since the bill is received. If the article could not be accepted for a reason, then the fee will be fully refunded;
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If the requirements from points 1-4 are not fulfilled, then I am willing that the article will not be processed.

Thus this statement is made for the article publication process.

The first author,

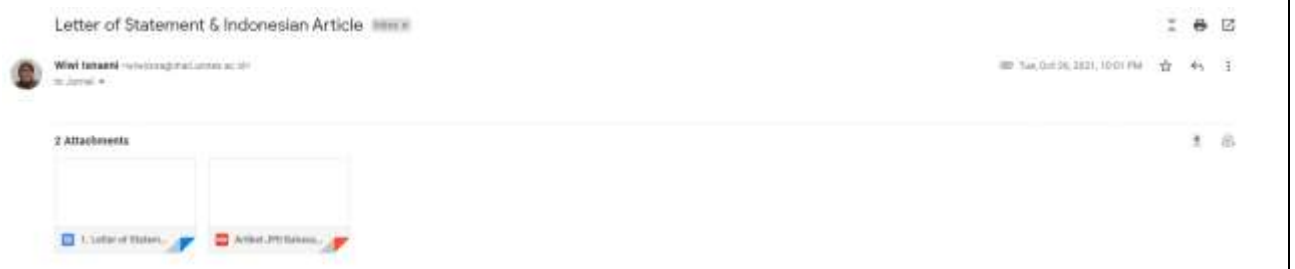
WIWI ISNAENI

Note: sent this letter of statement by email to jpii@mail.unnes.ac.id

6	**25-10-2021**	**Penerima permintaan mengirimkan naskah artikel berbahasa Indonesia kepada (Chief Editor/Tim Jurnal), paling lambat 27 Okt.**

7	**26-10-2021**	**Mengirimkan artikel berbahasa Indonesia via Email dalam format MS Word (oleh Penulis Utama) dan Letter of Statement yang telah di tanda tangani.**

8	**26-10-2021**	**Mengirimkan artikel berbahasa Indonesia format pdf (atas inisiatif sendiri) dan Letter of Statement yang telah ditanda tangani.**



9	**02-11-2021**	**Menerima pemberitahuan hasil review pertama telah diunggah di OJS;** Author diminta merevisi artikel, dan mensubmit hasil revisi paling lambat tanggal 5 November 2021; Submit artikel **hasil revisi pertama** pada tanggal 5-11- 2021.Hasil revisi pertama disubmit dalam dua versi, yaitu versi Bahasa Indonesia dan Bahasa inggris.

Author **submit artikel hasil revisi pertama** pada tanggal 5 – 11 – 2021, tetapi ternyata ada kekeliruan pada artikel, sehingga artikel yang dikirim ranggal 5 November saya delete. Selanjutnya artikel hasil revisi pertama saya submit ulang pada tanggal 6 – 11 – 2021.
Pada hasil review yang pertama terdapat beberapa hal mendasar pada artikel yang harus diperbaiki. Catatan tentang bagian yang di revisi dan hasil revisinya, disajikan pada **tabel Daftar catatan reviewer.**

Tabel Daftar Catatan dari Reviewer Pertama & revisi pertama yang dilakukan author		
No.	**Catatan Reviewer**	**Tindakan Revisi**
1	INTRODUCTION should: • contain urgency (importance) to research • contain a carrying capacity in the form of supporting data and facts • contain a preliminary study as a basis for the importance of the research conducted • contain a GAP ANALYSIS Departing from the preliminary study, analysis of published articles formulated in the Gap analysis GAP ANALYSIS refers to articles published in various internationally reputable journals to emphasize the novelty of research. • clear limitation of research objectives	Dilakukan revisi menyeluruh, sesuai masukan/koreksi Reviewer, dengan lebih menegaskan tentang urgensi masalah ini untuk diteliti, menambahkan hasil studi terdahulu, menegaskan tentang anaalisis gap mengacu kepada berbagai artikel yang memadai. Menegaskan tentang novelty Memerjelas tentang pembtasan masalah
2	METHODS should • contain detailed research stages • Each stage is explained and analyzed by what method • Data analysis must be with clear references • The research instruments used were elaborated to the data analysis technique • It is hoped that there will be a modification in the stages of research from sources referred by the researcher	Sudah diperbaiki sesuai saran/koreksi dari reviewer
3	RESULTS AND DISCUSSION • Tables or graphs (one selected) must represent different results • The results of data analysis must be strong in answering the analysis gap • Display of results other than those narrated in table-graph-image-modeling • The research novelty has not been clear enough • It is recommended not to repeat the references in the introduction, using previous research findings. • References used should be taken from reputable journals. It is necessary to explain the specifications of the findings in this study that show	Sudah diperbaiki sesuai saran/koreksi dari reviewer
4	Make it in the Acknowledgement part. Include the contract number of the funding letter.	Sudah diperbaiki sesuai saran/koreksi dari reviewer.
5	1. Please provide at least 30 references which 80% of them are taken from the last 10 years (>2011) articles of no-predatory journals, written in accordance with the APA Standard. You may go to Google Scholar and find the right format for APA Style provided. 2. For books, please refer to the original/primary book reference no matter the date. 3. All of the listed references must be cited in the body of the article, and vice versa.	Sudah diperbaiki sesuai saran/koreksi dari reviewer

Paper title: POTENTIAL ANALYSIS OF THE ANDROID-BASED LEARNING MEDIA AS A MEANS TO TRAINCRITICAL THINKING SKILLS AND SCIENTIFIC ATTITUDES						
Parts of review	**Guidelines**	**Yes**	**Partly**	**No**	**Reviewer's note for improvement**	**Author's responds (highlight of revision)**

Title	• Does the subject matter fit within the scope of journal?	√				
	• Does the title clearly and sufficiently reflect its contents?	√				
Abstract	• Does the abstract contain informative, including Background, Methods, Results and Conclusion?	√				
Back-ground	• Is the background informative and sufficient (include the background problem and objectives)?		√			
	• Is research question of the study clear and understandable?		√			
	• Does the rationale of the study clearly explained using relevant literature?		√			
	• Is the "aim" of the manuscript clear and understandable?	√				
Methods	• Is the methodology chosen suitable to the nature of the topic studied?		√			
	• Is the methodology of the research described clearly?(including study design, location, subjects, data collection, data analysis)		√			
	• Is there adequate information about the data collection tools used? (only for empirical studies)		√			
	• Are the validity and reliability of data collection tools established? (only for empirical studies)	√				
	• Are the data collection tools suitable for the methodology of the study? (only for empirical studies)		√			
Results & Discussion	• Are the tables, graphs and pictures understandable, well presented and numbered consecutively?		√			
	• Do the data analysis and the interpretation appropriate to the problem and answer the objectives?		√			
	• Does the "discussion" section of the manuscript adequately relate to the current and relevant litarature?		√			
	• Are the findings discussed adequately considering the research question(s), sub-question(s) or hypothesis?		√			
Conclusion	• Is the conclusion clear and in the form of a narration instead of pointers?		√			
	• Isn't the conclusion a summary and consistent between problems, objectives and conclusion?		√			
References	• Do the references and citations match?		√			
	• Are the writing of references correct?		√		Add the latest sources from reputable journals.	
Quality Criteria	• Do the title, problem, objectives, methods and conclusion are in line? Is it well organized?		√			
	• The quality of the language is satisfactory		√			
	• The work relevant and novel		√			
	• Are there strong consistencies among the parts of the manuscript? (introduction, methods, results and discussion, and conclusion)		√			

Author submit artikel hasil revisi pada tanggal 5 – 11 – 2021, tetapi ternyata ada kekeliruan pada artikel, sehingga artikel yang dikirim ranggal 5 November saya delete. Selanjutnya saya submit ulang arftikel revisi pada tanggal 6 – 11 – 2021.

10	**10-11-2021**	**Pemberitahuan hasil evaluasi terhadap artikel hasil revisi pertama; Artikel diterima dan akan dipublikasikan pada edisi Desember 2021;**

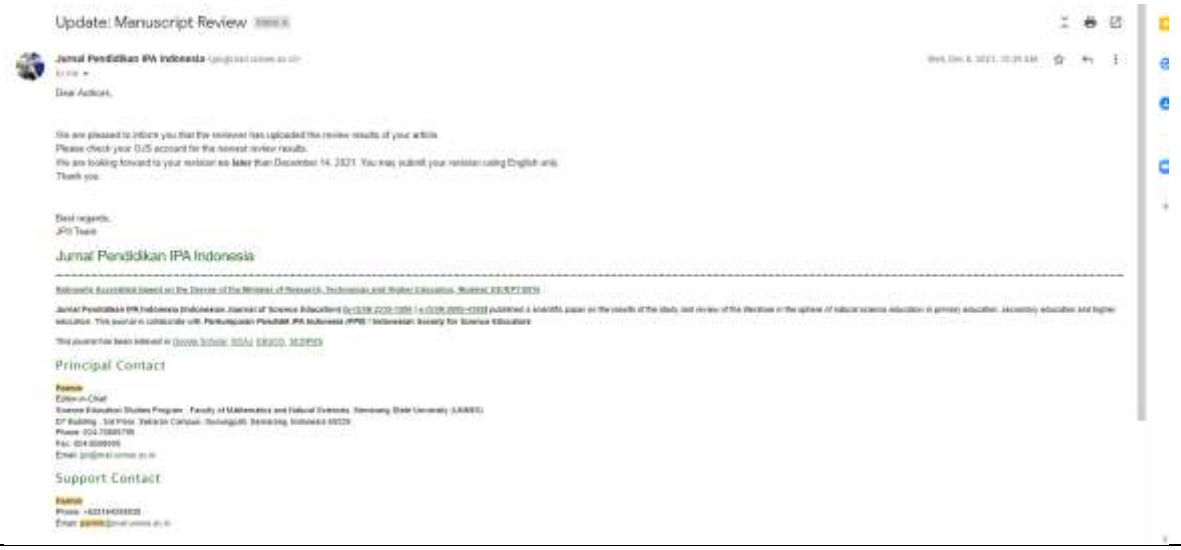
11	**1-12-2021**	**Menerima pesan untuk merevisi artikel (revisi kedua) dengan cara memeriksanya di OJS,** dan mensubmit artikel hasil revisi kedua di OJS **paling lambat 5 -12-2021;**

Proses revisi kedua membawa perubahan mendasar terhadap artikel ini, yang membawa kepada perubahan Judul dan metode penelitian. Hal sangat penting pada revisi kedua ini disajikan pada Tabel

Daftar Catatan dari Reviewer kedua

Tabel Daftar Catatan dari Reviewer Kedua dan revisi kedua yang dilakukan author		
No.	**Catatan Reviewer**	**Tindakan Revisi**
1	**The Titlle:** Use the other term instead of potential analysis. A means means tools?	**Change the title of the article to** Analysis of The Role of Android-Based Learning Media in Learning Critical Thinking Skills and Scientific Attitude
2	**General:** Pre-experimental research is a kind of beginner research whose validity and reliability cannot be justified, unless it is coupled with development research or combined with in-depth qualitative research. Therefore, this article can be considered if accompanied by research on media development or with in-depth descriptive research, and it should be analyzed /discussed in depth and comprehensively.	**Revise the rethe research methods**, with improved it to an in-depth descriptive study, which was analyzed/discussed in depth and comprehensively.

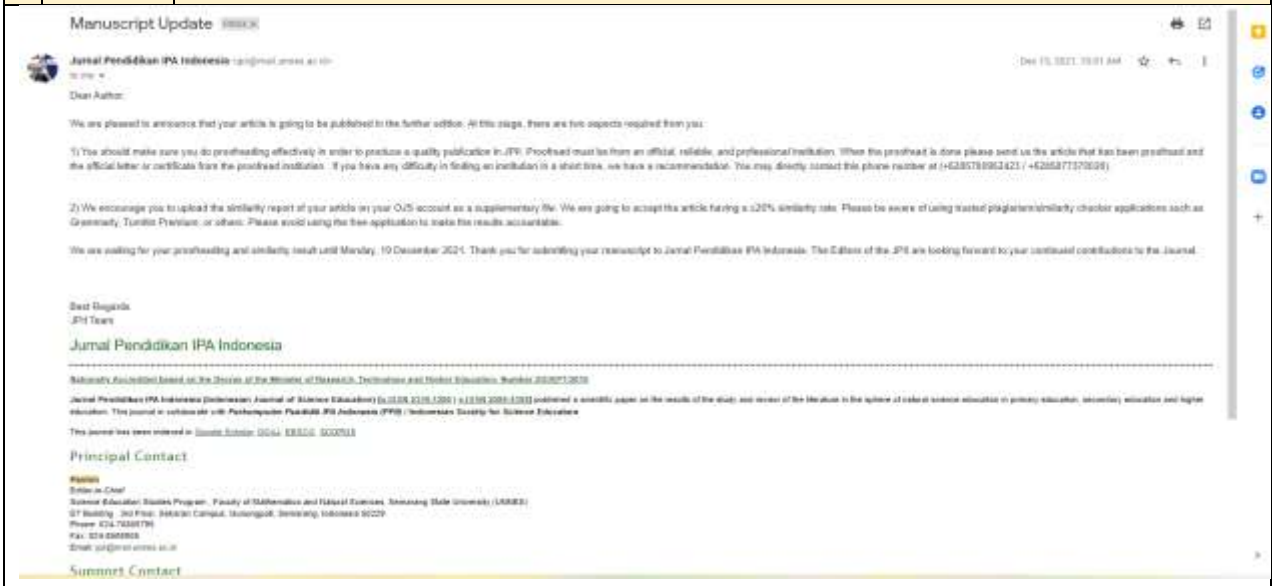
12	**08-12-2021**	Menerima pesan untuk merevisi artikel **(revisi ketiga)** dengan cara memeriksanya di OJS, dan **mensubmit artikel hasil revisi** (**revisi ketiga**) di OJS **paling lambat 14 Desember 2021**. Artikel yang dikirim **hanya menggunakan bahasa Inggris.**



Tabel Daftar Catatan dari Reviewer Ketiga dan Revisi Ketiga yang dilakukan author		
No.	**Catatan Reviewer**	**Tindakan Revisi**
1	**Bagian INTRODUCTION** This section must cover the background, gap analysis, research objective, research status, research urgency, research novelty supported by the data of previous research. NOTE: Research status is the point of this study towards other studies, whether it supports, debates, or corrects, and this section lacks of it. In addition, the research novelty and urgency have not also been stated clearly.	Memperbaiki bagian Introduction sesui koreksi/catatan reviewer

2	Bagian: Data Analysis Need more information of the data analysis used in this study.	Memperbaiki bagian analisis data sesuai koreksi/catatan reviewer
3	Why using purposive random sampling? And what are the considerations choosing this sample?	Menjelaskan alasan menggunakan purposive random sampling.
4	Data research & n instrument What is the type of test? Multiple choice test or open ended questions?	Menjelaskan jenis tes yang digunakan.
5	KKM What is KKM? Significant difference need to prove by statistical analysis.	Menjelaskan/mendeskrip- sikan tentang KKM. Pada bagian ini tidak dilakukan analisis statistic, karena hasil pre dan post test tidak dimaksudkan untik melihat beda di antara keduanya, tetapi kedua hasil tersebut digunakan untuk menentukan besarnya peningkatan hasil belajar antara sebelum dan sesudah belajar menggunakan media.
6	**RESULT & DISCUSSION** You need to explain the learning media used in this study Androwebic and E-Bokartumban. Probably, you can explain the part of these learning media.	Memperbaiki bagian ini sesui koreksi/ catatan reviewer
7	**Very good:** From where this criteria are coming from? Why all criteria are very good	Memberi penjelasan tentang hal ini.
8	**Table 5.** Competency indicators of environmental care attitudes in students and components of the E-Bokartumban media that facilitate the emergence of these attitude indicators. You need to put figure of each part of media component	Memperbaiki artikel sesuai saran/koreksi reviewer, dan menambahkan beberapa gambar yang sesuai.
	Komentar terhadap paragraph ini *The availability of various menus on Androwebic media (see Fig 1 and Table 2) stimulates students' curiosity and encourages students to practice problem solving. Both activities require analytical thinking skills, so that students' abilities in that regard are well trained.* Could you explain more of this statement?	Memperbaiki / mejelaskan bagian ini dengan nmemberikan ontoh-contoh masalah yang diajukan dalam menu diskusi yang terkait dengan peristiwa keseharian antara lain ialah tentang kerja jantug, keadaan darah yang normal dan tidak, tentang golongan daran. Itu senua adalah hal-hal keseharian yang sangat seruing dialami siswa.
	"It happened because since the beginning of the learning process using androwebic media students are always motivated to learn and seek information independently. During the learning process assisted by Androwebic media students show a more caring attitude, respect, and draw conclusions according to facts." Is this statement related to learning media used in this study?	Menjelaskan keterkaitan antara pernyataan itu dengan penggunaan media pembelajaran pada penelitian ini
	This study is lack of discussions. The discussion chapter is where you delve into the meaning, importance and relevance of your results. It should focus on explaining and evaluating what you found, showing how it relates to your literature review and research questions, and making an argument in support of your overall conclusion.	Menambahkan diskusi sesuai koreksi reviewer
	Put in the acknowledgement	Menambahkan acknowledgement
	Referrence Add more the latest sources from reputable or international journals. Taken from **the last 10 years (>2011)**	Menambahkan referensi sesuai catatan reviewer

13	**15 -12-2021**	Menerima pemberitahuan tentang **penerimaan artikel** (**Article Acceptance**) **paska revisi ketiga**, dan tentang **rencana jadwal publikasi;** Perlu melakukan **proofreading artikel** pada lembaga professional, dan melakukan **pemeriksaan similarity (cek Turnitin)** terhadap artikel ini. Hal di atas harus **disubmit tanggal 19-12-2021.**



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This document is to certify that the manuscript

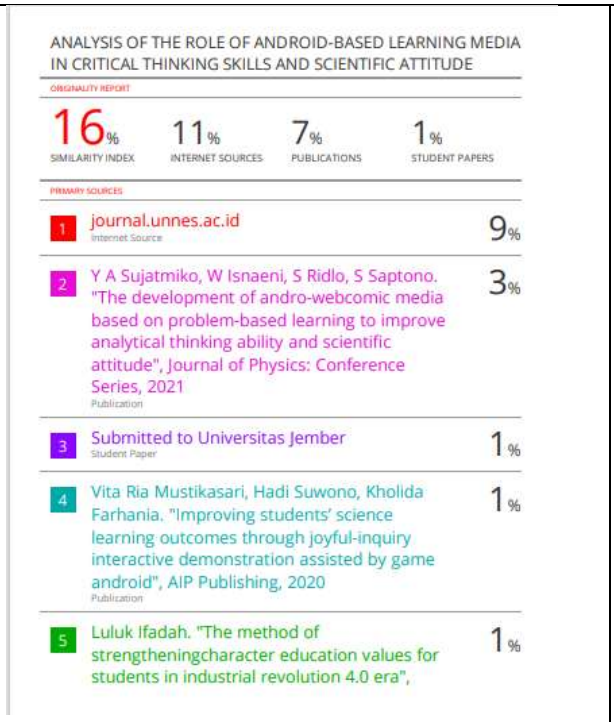
ANALYSIS OF THE ROLE OF ANDROID-BASED LEARNING MEDIA IN CRITICAL THINKING SKILLS AND SCIENTIFIC ATTITUDE

written by

Wiwi Isnaeni

has been proofread for English Language Usage by Media Publikasi and returned to customer on December 16, 2021

ATIKA SEPTIA MAHARDINI, S.PD
Director of Training and Education Center



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Sesuai pesan dari Tim Jurnal, author melakukan **Revisi Keempat**, dan mensubmit **hasil revisi keempat** pada tanggal 23-12-2021.

Update: Manuscript Review

Jurnal Pendidikan IPA Indonesia

Dear Author,

We would like to inform you that there are several citations that the sources have not been mentioned in the references section, and there are several sources in the references that are not cited in the article. Please also pay attention to the tables and figure order: 1. Each picture/table is preceded by an introduction to the description, and after the picture/table is given a description of the results shown. 2. The pictures/tables must not be consecutive. Please check the attachment file below. We will wait for your revision until Thursday, December 23, 2021. Thank you very much.

Sincerely,
JPII Team

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Aktivitas Author:

1. Merevisi artikel dengan cara a) menambahkan beberapa referensi yang sudah disitasi, tetapi belum tercantum dalam daftar referensi, b) menghapus beberapa referensi yang ada dalam daftar tetapi tidak disitasi, c) merevisi dengan cara menambahkan komentar /deskripsi tentang gambar-gambar dan tabel yang ada dalam naskah; d) memperbaiki urutan/penomoran Tabel dan gambar (setiap gambar/tabel didahului dengan pengenalan deskripsi, dan setelah gambar/tabel diberikan penjelasan tentang gambar/tabel tersebut).

2. Submit Artikel **hasil revisi keempat**, 23 Desember 2021

15	**23-12-2021**	**Menerima pesan untuk:** **1. memeriksa pernyataan keaslian (declaration of originality) dan surat pernyataan, menanda tangani surat-surat tersebut, dan mengunggah pada akun OJS sebagai berkas pelengkap;** **2. unggah laporan hasil Turnitin di akun OJS** **3. melengkapi juga semua nama penulis Anda di metadata OJS**


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Dear Authors,
We are pleased to send the LoA and publication receipt of your manuscript.
It has been a pleasure to work with you.
Thank you very much.
Best regards,
JPII Team
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We the undersigned declare that this manuscript is original, has not been published before and is not currently being considered for publication or submitted elsewhere.

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

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16	**24-12-2021**	**Menerima kiriman Letter of Acceptance**

JURNAL PENDIDIKAN IPA INDONESIA

LETTER OF ACCEPTANCE
JURNAL PENDIDIKAN IPA INDONESIA (JPII)
No: 94/JPII/R.A./2021

The officials of Jurnal Pendidikan IPA Indonesia (JPII) Nationally Accredited and Indexed by Scopus give special thanks for submitting article for December 2021 Edition. Based on reviewers' decision, we as the officials stated that:

Article Title : ANALYSIS OF THE ROLE OF ANDROID-BASED LEARNING MEDIA IN LEARNING CRITICAL THINKING SKILLS AND SCIENTIFIC ATTITUDE

Authors : W. Sesanti, T. A. Prajanisko, S. Ridlo, Pujiastuti

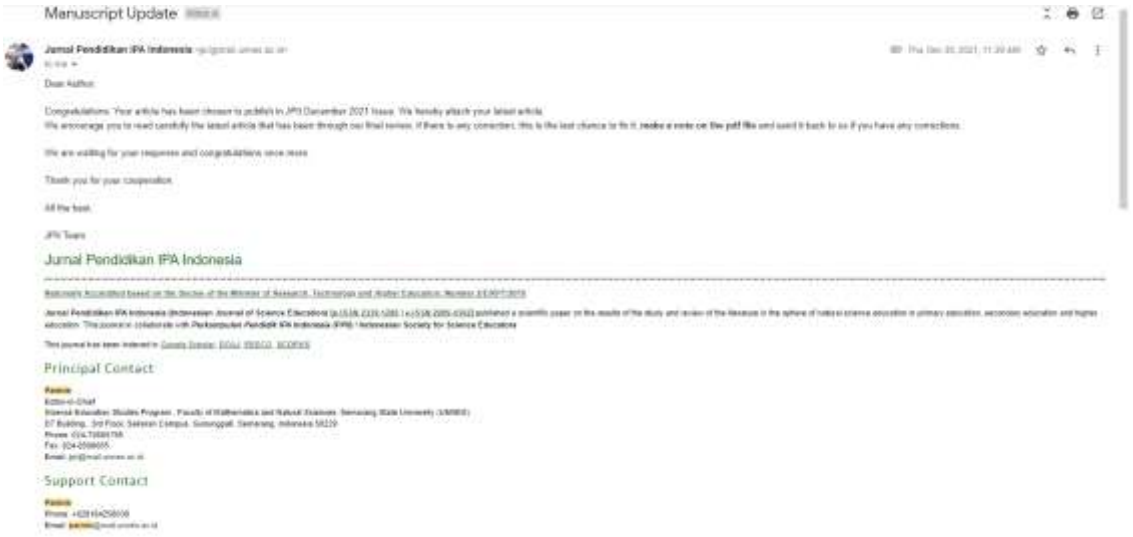
is **accepted** and is going to be published in JPII December 2021 Edition.

The admission letter is made for appropriate use only. Thank you for the cooperation.

Semarang, 13th December, 2021
Editor-in-Chief of JPII,

Dr. Parmin, M.Pd

17	**30-12-2021**	**Menerima pesan untuk memeriksa keadaan artikel setelah proses lay out oleh Tim JPII (pengecekan akhir sebelum publish / revisi kelima)**



Manuscript Update

Jurnal Pendidikan IPA Indonesia

Dear Author

Congratulations. Your article has been chosen to publish in JPII December 2021 Issue. We hereby attach your latest article.
We encourage you to read carefully the latest article that has been through our final review. If there is any correction, this is the last chance to fix it. make a note on the pdf file and send it back to us if you have any corrections.

We are waiting for your response and congratulations once more.

Thank you for your cooperation.

All the best,

JPII Team

Jurnal Pendidikan IPA Indonesia

Principal Contact

Support Contact

Revisi kelima (pengecekan akhir sebelum publish di Web)

Aktivitas Author:
Membaca dan mencermati isi artikel terbaru yang dikirim Tim Jurnal itu dengan seksama. Author menemukan cukup banya kesalahan tulis, baik dalam badan teks artikel maupun dalam daftar referensi. Menandai bagian yang dikoreksi dengan warna kuning.
Submit artikel hasil revisi akhir (**revisi kelima**), pada 31 Des 2021 jam 02:32.

18	**31-12-2021**	**Submit artikel final kepada Tim JPII via OJS**


Wiwi Isnaeni

Dear JPII Team

Thank you very much for your information.
Here we send the revised PDF file, the same file as the file that the JPII Journal Team sent to me, but I have added a note of improvement to the file I sent. My repair notes are marked in yellow.
Thank you for the kindness of the JPII Team

19	**10-01-2022**	**Pemberitahuan dari Tim JPII bahwa artikel telah Publish di Web, dan meminta author melakukan pemeriksaan terakhir terhadap keadaan artikel (revisi keenam).**


Article Checking

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to bcc: me

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Congratulations. We would like to inform you that your article has been published on the Web. Please check it for the last time. We will wait until Tuesday, 11 January 2022. After passing tomorrow, it cannot be edited again. If there is any correction, make a note on the pdf file in the website and send it back to us.
Thank you for your attention. We would like to hear from you soon. Congratulations!

Sincerely,
JPII Team

20	**12-01-2022**	**Author mengirimkan hasil pemeriksaan terakhir (revisi keenam) kepada Tim JPII**


Wiwi Isnaeni

Assalamualaikum wr wb.
Dear JPII Team, sorry, I was late to find out and read the email from the JPII Team, so I just edited it this morning (adding what is still missing).
In my article, I found a lack of one word in the title, less than 1 source of reference in the reference, and there was an error in writing the year in one of the reference sources.
The results of editing / adding my notes are in the attached article.
Sorry for my delay, and thank you.

Jurnal Pendidikan IPA Indonesia <jpii@mail.unnes.ac.id>

Jan 12, 2022, 9:31 AM

to me

Dear Author

We will edit it. Thank you

Regards,
JPII Team

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Jurnal Pendidikan IPA Indonesia (Indonesian Journal of Science Education) [p-ISSN 2338-1299 | e-ISSN 2460-4356] published a scientific paper on the results of the study and review of the literature in the sphere of natural science education in primary education, secondary education and higher education. This journal in collaborate with *Perkumpulan Pendidik IPA Indonesia (PPII)* / Indonesian Society for Science Educators

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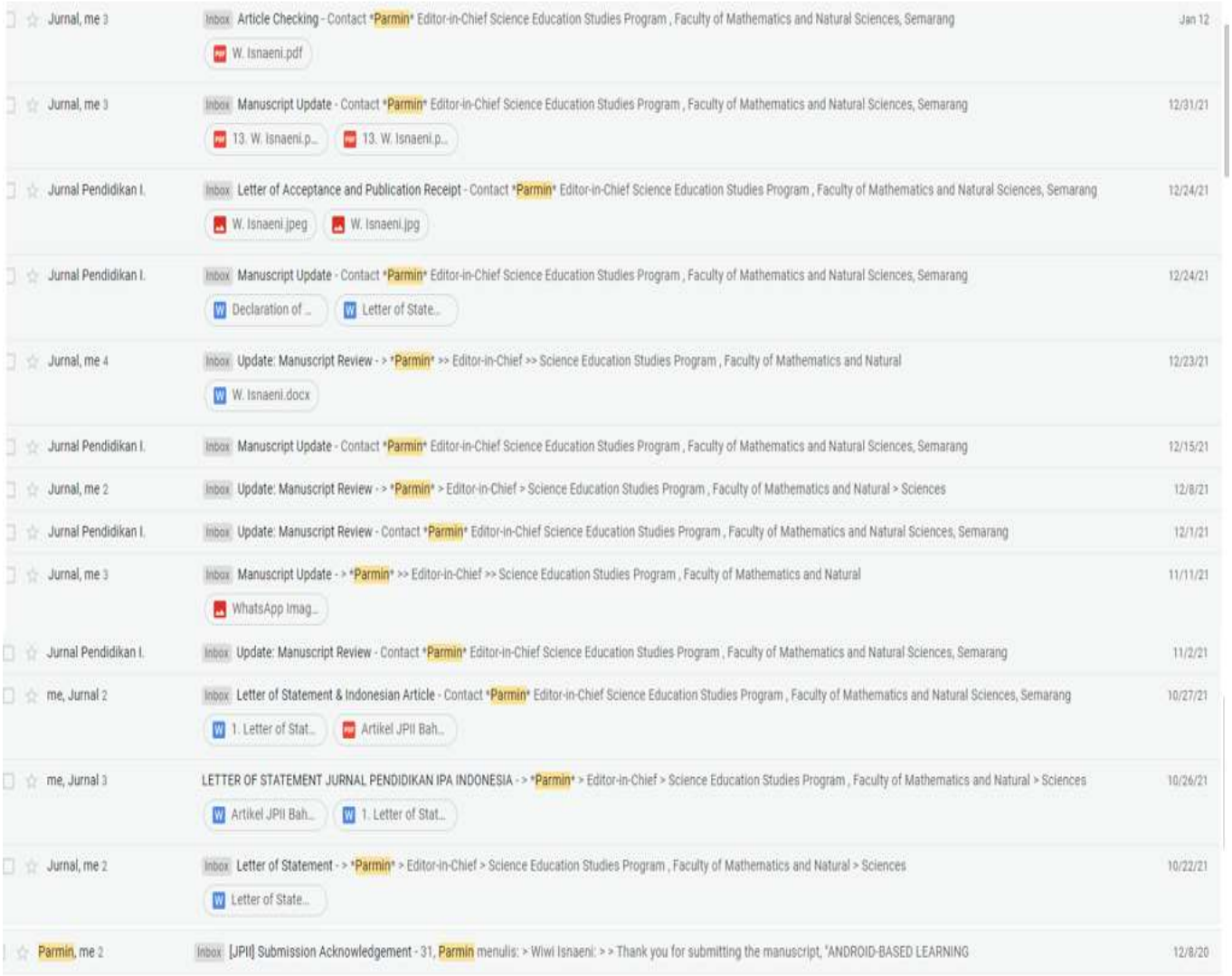

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