THE DEVELOPMENT OF EDMODO ON IMMUNE SYSTEM MATERIAL TO TRAIN CRITICAL THINKING: VALIDITY AND STUDENT RESPONSES

Pengembangan Edmodo pada Materi Sistem Imun untuk Melatihkan Berpikir Kritis: Validitas dan Respons Siswa

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Abstract

The spread of Covid-19 continues to increase, causes the government to issue policies that can supress this spread. One of the policies in educational field is distance learning. The distance learning is helped out by technology development, but it requires student to think at a high level such as critical thinking. Critical thinking skills can be trained in biology. The material that need critical thinking skills is immune system. In fact, immune system material is considered difficult and the result of national exam show only 25.19% of student can complete this material. Therefore, it is necessary to have learning media that can facilitate the achievement of basic competency and critical thinking skills. This research aims to produce Edmodo that equipped with student worksheets to train critical thinking skills. This research is development research with 4D Model (Define, design, develop, disseminate). It was limited to the development stage to determine the validity of product based on expert opinion and also the practicallity based on the responses of eleventh grade student in SMA Negeri 1 Waru Sidoarjo. Quantitative descriptive analysis was applied for the data gained. The result showed the validity of Edmodo were 3.88 on presentation aspect, 3.91 on content, and 3,89 for the total average. The student worksheet validity resulted were 3.90 on presentation, 3.95 on content, 3,89 on language, 3.67 on critical thinking, and 3,85 for the total average. Both of them are categorized as very valid. The results of student responses are 88.03% in the very practical category. Thus, the development of Edmodo and student worksheet is valid and practical to used in lerning.
Keywords: Edmodo, student worksheets, immune system, critical thinking skills.

Abstrak

Persebaran COVID-19 terus mengalami peningkatan, membuat pemerintah harus mengeluarkan kebijakan untuk menekan persebarannya. Salah satu kebijakan di bidang pendidikan adalah pembelajaran jarak jauh. Pembelajaran jarak jauh terbantu dengan adanya perkembangan teknologi, namun menuntut siswa untuk berpikir tingkat tinggi, seperti berpikir kritis. Keterampilan berpikir kritis dapat dilatihkan melalui mata pelajaran biologi. Materi yang membutuhkan keterampilan tersebut adalah sistem imun. Pada kenyataannya materi sistem imun dianggap sulit dan hasil ujian nasional menununjukkan hanya 25,19% siswa yang dapat menyelesaikan materi ini. Oleh karena itu perlu adanya peran media pembelajaran yang dapat memfasilitasi pencapaian kompetensi dasar dan keterampilan berpikir kritis. Tujuan penelitian ini yaitu menghasilkan Edmodo yang dilengkapi LKPD untuk melatihkan keterampilan berpikir kritis. Penelitian ini merupakan penelitian pengembangan dengan model 4D (Define, Design, Develop, Disseminate). Penelitian ini terbatas pada tahap develop untuk mengetahui validitas produk berdasarkan pendapat ahli, serta kepraktisan yang ditinjau dari respon siswa kelas XI SMA Negeri 1 Waru Sidoarjo. Analisis data dilakukan secara deskripsit kuantitatif. Hasil penelitian menunjukkan validitas Edmodo sebesar 3,88 pada aspek penyajian, 3,91 pada aspek materi, dan 3,89 secara keseluruhan. Validitas LKPD sebesar 3,90 pada aspek penyajian, 3,95 pada aspek materi, 3,89 pada aspek bahasa, 3,67 pada aspek berpikir kritis, dan 3,85 secara keseluruhan. Keduanya termasuk dalam kategori sangat valid. Hasil respons siswa sebesar 88,03% dengan kategori sangat praktis. Dengan demikian Edmodo dan LKPD yang dikembangkan dinyatakan valid dan praktis untuk digunakan dalam pembelajaran.
Kata Kunci: Edmodo, LKPD, sistem imun, keterampilan berpikir kritis.

INTRODUCTION

The coronavirus (COVID-19) has spread all over the world. The data showed that 5.5 million new cases confirmed on May 11, 2021 (WHO, 2021). This number has risen 6%. In Indonesia, the national data accumulation from Satuan Tugas Penanganan Covid (2021) on May 2021 showed that the confirmed case rises from the last month. It makes the government issues policies that can surpress the number of coronavirus spread. This policy impacts on educational field, based on the Letter of Minister Education and Culture Number 4 of 2020, the learning process will be doing in distance learning. The distance learning is an institutionally based educational method where students physically were separated from teacher and the learning process uses interactive telecommunication devices (Rizaldi, 2020).

The development of technology and communication may help distance learning but another challenge will be awaiting. The change in learning due to technology development impact the need of student to think in a high level. Based on PISA result on OECD (2019), the ability of Indonesian students in reading, mathematics, and science is under the average of OECD. The global score for reading, mathematics, and science were 487, 487, and 489. In contrast, Indonesia only got 371, 379, and 396 points resulting Indonesia at a sixth-bottom rank. The students with high level ability are only 1%. Based on PISA data, it can be concluded that Indonesian student's skills in higer order thinking still low, dominated by lower order thinking skills (LOTS). This data also shows that the quality of Indonesia education is low and needs effort to improve the quality of Indonesia education (Norhasanah, 2018). The quality of education can be improved by training higher-order-thinking skills in learning process, such as critical thinking skills.

Higher order thinking skills are including critical and creative thinking. Critical thinking skills are the complex thinking process that including interpretation, analysis, evaluation, inference, and self regulation process (Lismaya, 2019). The student who able to think critically has signs of having careful analysis, judgement skills, and solution towards problems (Lubis, 2019). The students need critical thinking skills because it is essential to help students analysing and solving daily problems (Ramadhan et al, 2018). The skills trained in this research were interpretation, analysis, evaluation, inference, and explanation.

Higher order thinking skills can be obtained by learning science. As an example is in learning biology as it needs logical thinking, rational thinking, critical thinking, creative thinking, and decision making (Sudarisman, 2015). Biology learning is supposed to develop mastery of concepts, biology principles, and thinking skills. In the curriculum 2013, one student's basic competency that has to be obtained is anaylsing. Analysing is one of the skills in critical thinking. An example of the material that can be used to train critical thinking skills is the immune system. The basic competency of the immune system requires students to analyze the immune system's role and immunization towards physiological process inside the body. The minimun critical thinking requires in this basic competency is analysing, while this research is developed until explanation skills. The reason of this research was developed until explanation skill because the students may need complex critical thinking skills to solve daily problems. According to the national examination result, only 25.19% of students can solve the question about immune system (Puspendik, 2019). The research conducted by Nuridah (2019) also showed that the student's ability to mastery immune system material was low, with the average score of 65.83. These data showed if the immune system material has not been mastered by the students.

The role of learning media is needed to obtain learning goals. The media usage need to cover several characteristics, so the result will be optimum. The characteristics are the purpose of use, target, media characteristic, time, cost, and media availability (Abidin, 2016). The reality in learning immun system still shows teacher centered. The pre-research questionnaire which was delivered online shows 37.5% of students having difficulty to understand immune system material. It happened because the learning process was teacher centered, without involving students in learning actively. The students who are not involved actively in learning made them lack of critical thinking skills. The reason is because students only rely on teacher explanation, eventhough the material is not difficult (Sunaryo, 2014).

The need to train critical thinking skills in Covid-19 pandemic is needed, so it needs to use Edmodo as learning media on immune system material. Edmodo is the learning media that student can access through mobile phones or website, which help teachers to optimize learning during pandemic. Some features on Edmodo that help teacher to optimize larning are assignment, sharing files, timeline post, and comment section. The teacher can use sharing files to give learning material such as student worksheets, powerpoint, videos, and pictures. The assignment feature helps teacher to collect student's task. Teacher can control the submitting date for student on this feature, so the student would submit it on time. Timeline post and comment section can be used to

discuss during learning process. Those features may help teacher to organize learning process and faciltiates critical thinking skills trained. According to Zainudin and Pambudi (2019), the use of Edmodo to train critical thinking skill is in moderate category.

This research is also developing student worksheets as the Edmodo complement. The student worksheets used to train critical thinking skills. It has 5M or scientific phases such as observing, questioning, data collecting, reasoning, and communicating. On the reasoning phase, critical thinking skills are trained. The student worksheets will be inputed on Edmodo, so the students can access easily. According to Kemp (2020), the user of handphone in age 16-64 is around 94%. The high number of handphone user may support Edmodo usage in learning process. Another reason that support this research is Edmodo has not been widely used by teachers for distance learning. Therefore, Edmodo has a potency as the learning media to help high school students train crtical thinking skills on immune system material. Based on background research, it is necessary to develop Edmodo to train critical thinking skills on immune system material.

METHODS

The research conducted was development research. It was done in department of biology, Mathematics and Science Faculty of Universitas Negeri Surabaya and SMA Negeri 1 Waru Sidoarjo. The development research was using the 4D model which it includes define, design, develop, and dissemination stage (Thiagarajan, 1974). However, the dissemination stage was not done. The define stage was analysing curriculum. Curriculum analysis consists of student analysis, concept analysis, and task analysis. The result of curriculum analysis were indicators and learning goals. The second stage was designing. At this stage, researcher was planning the arrengement of activity in Edmodo and predesign of student worksheets. Researcher was revising the Edmodo and student worksheets based on expert suggestion at developing stage.

The validity of the product was assessed by media expert lecture, material expert lecture, and a teacher of biology in high school. The component of validation on Edmodo developed are presentation and content. On the other hand, the component of validation on student worksheets developed are presentation, content, language, and critical thinking skills. The validity of the products was tested by Likert scale, with a score range of 1 to 4. The validity score is calculated using the formula:

$$\text{Validity Score} = \frac{\text{Total score obtained}}{\text{Maximum score obtained}}$$

The result would be interpreted based on the criteria in Table 1. It is valid if the average score is $\geq$ 2.51 (Riduwan, 2019).

Table 1. The validity score of products developed

Category	Score
Not valid	1.00 – 1.75
Quiet valid	1.76 – 2.50
Valid	2.51 – 3.25
Very valid	3.25 – 4.00

(Adapted from Riduwan, 2019)

The student responses were collected from online questionnaire. This questionnaire was filled by 18 students of XI IPA 1 at SMA Negeri 1 Waru Sidoarjo. The highest score of this questionnaire is 1, while the lowest score is 0. The questionnaire's result will be analyzed to determine practicallity. Student responses were calculated using the following formula:

$$\text{Student response percentage} = \frac{\text{Total score answering "Yes"}}{\text{Total of responden}} \times 100$$

The result would be interpreted based on the criteria listed in Table 2. The product is pratical if the student's positive response is more than 61%.

Table 2. Practicality score based on the positive response from questionnaire

Category	Positive response (%)
Not practical	0-20
Less practical	21-40
Quiet practical	41-60
Practical	61-80
Very practical	81 - 100

(Adapted from Riduwan, 2019)

RESULT AND DISCUSSION

The product developed was Edmodo and student worksheets. Edmodo was developed to facilitate students in critical thinking, while the student worksheets were developed for two meetings to train critical thinking. The first step in development research was defining curriculum 2013. It was resulting indicators of competency achievement and learning goals. The result of curriculum analysis showed in Table 3 below.

Table 3. The result of curriculum analysis

Indicators	Learning Goals

Indicators		Learning Goals	
3.14.1	Identifying innate and adaptive immune systems.	3.14.1.1	Student are able to identify the types of immune systems based on discussion results.
		3.14.1.2	Student are able to describe the components and the characteristic of innate and adaptive immune systems through discussion.
3.14.2	Describing the mechanism of immune systems inside the body.	3.14.2.1	Student are able to describe the characteristics of innate and adaptive immune systems through discussion.
3.14.3	Explaining immune systems diseases.	3.14.3.1	Student are able to explain the diseases related to immune systems based on discussion.
3.14.4	Analysing the relation between immune system and immunization.	3.14.4.1	Student are able to explain the relation between immune systems and immunization based on discussion on student worksheet.
4.14.1	Making digital poster about the importance of immunization.	4.14.1.1	Student are able to make digital poster that contains the importance of immunization for the body in groups based on discussion activities.
4.14.2	Campaigning the importance of immunization through digital posters.	4.14.2.1	Student are able to campaign the importance of immunization through digital posters using social media in groups.

Developing a curriculum needs to pay attention to the characteristics of students and subject material. The average age of eleventh grade students is 16-17 years old. At this stage, the cognitive development is in the formal operational stage. It means that students can think abstract, logical, and able to draw conclusion (Mauliya, 2019). This ability helps students to understand immune system material because this material is abstract. Analysis of subject material referred to the 3.14 and 4.14 basic competency. The basic competency of 3.14 is analysing the role of the immune system and immunization on physiological process inside the body. The basic competency of 4.14 is conducting campaigns on the importance of community participation in program and immunization as well as abnormalities in immune system.

At the designing stage, the researcher was planning the arrangement of Edmodo and predesign of student worksheets. This stage began with selecting the content on immune system material. As the result, the material used in learning are definition, types, mechanism, diseases on the immune system, and immunization. Those materials will be packaged on powerpoint and uploaded on Edmodo. The next step is arranging the activity for learning on Edmodo. After arranging the activity on Edmodo, researcher is designing student worksheets. The student worksheets developed were using 5M or scientific approach. It consists of observing, questioning, collecting data, reasoning, and communicating phase. The critical thinking skills are trained in the reasoning phase. The skills trained are interpretation, analysis, evaluation, inference, and explanation.

The last stage is development. At this stage, Edmodo and student worksheets will be reviewed and validated by validators. Validators also gave suggestions on the product developed. Based on the result of validation score and suggestion, the product was revised. The suggestion from validators was summarized in Table 4 below.

Table 4. The recapitulation of suggestion

No	Suggestions

No	Suggestions
1	Adjust the class condition on Edmodo to the class that will be used in collecting data.
2	Shortened the posts and give the code for learning activities that are currently done.
3	Optimize features on Edmodo during learning.
4	Rearrange student worksheets to match with the good structure of student worksheets.
5	Add a work guide page for student worksheets.
6	Provide information on the types of critical thinking trained on student worksheets such as interpretation, analysis, inference, explanation, and evaluation.

After the products were revised, the arrangement of activity on Edmodo was made as concise as possible. It also optimizes the features on Edmodo such as sharing files, agendas, and assignments. Edmodo view can be seen in figure 1 below.
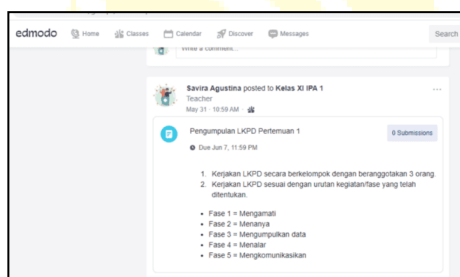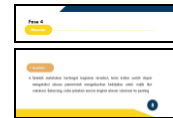

Figure 1. Edmodo view

The student worksheets were developed for two meetings. The first student worksheet was about innate and adaptive immunity, while the second student worksheet was about immunization. The details of student worksheets showed in Table 5.

Table 5. Critical thinking exercise in student worksheets
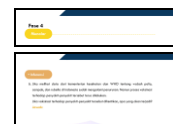
Skills	First	Second
Interpretation		

	Analysis		
	Evaluation		
	Inference		
	Explanation		

Each student worksheet had an answer key. It can be used by the teacher as an answer guide. The scores from validators were calculated. The product is valid if it has a score $\geq$ of 2.51 (Riduwan, 2019). The result of Edmodo validation showed in Table 6, while the result of student worksheets showed in Table 7 below.

Table 6. Edmodo validation result

No	Validation Criteria	Score V1	V2	V3	x
A.	**Presentation**				
1.	Edmodo as the learning media can be accessed through a website or smartphone.	4	4	4	4.00
2.	The activity arrangement in Edmodo learning media direct student to study independently.	4	4	4	4.00
3.	The activity arrangement on immune system material in Edmodo arrange coherently.	4	4	4	4.00

No	Validation Criteria	Score			x
		V1	V2	V3	
4.	The overall presentation of Edmodo is attractive and clear.	3	4	4	3.67
5.	The presentation of the various menus on Edmodo is easy to understand and use.	3	4	4	3.67
6.	The assignment feature helps in giving or submitting the task.	4	4	4	4.00
7.	The comment feature facilitated interactive discussion in learning.	4	4	4	4.00
8.	The agenda feature help student to see overall activity that will be doing.	3	4	4	3.67
	Average				3.88
B.	**Content**				
	Material Eligibility				
1.	The content material in Powerpoint matches with the need for basic immune system competency.	4	4	4	4.00
2.	The content material in Powerpoint matches with indicators and learning goals.	4	4	4	4.00
3.	The content material in Powerpoint presented coherently.	4	4	4	4.00
4.	The content material in Powerpoint matches the concept and theory.	4	4	4	4.00
5.	Pictures in Powerpoint are clear (Does not cause bias).	3	4	4	3.67
6.	Videos in Powerpoint matches concept and theory.	4	4	4	4.00

No	Validation Criteria	Score			x
		V1	V2	V3	
7.	The language used in immune system material clear and easy to understand.	3	4	4	3.67
	Average				3.91
	Overall average				**3.89**

Note:
V1: Material expert lecture
V2: Media expert lecture
V3: Biology teacher

The total average score for Edmodo validation is 3.89 and is categorized as very valid. The results showed that Edmodo is suitable for learning. The aspects that validated on Edmodo were presentation and content. The average score for the presentation was 3.88, while the average score for content was 3.91. Both of them are categorized as very valid. The aspect of the presentation consists of the media availability, activity arrangement, activity sequence, display, and feature used on Edmodo. The media availability of Edmodo got a perfect score. According to Kominfo's (2017) research, smartphone user at the high school level is reaching 79.56%. Edmodo can be accessed via the website or application on the smartphone, so it is possible for students to access it easily. According to Gon (2017), media availability is one of the good learning media characteristics. This characteristic should be considered because every student will have equal access during the learning process.

Activities on Edmodo is direct students to learn independently. This aspect got a perfect score and was categorized as very valid. The activities that direct student to learn independently is essential because independency plays a significant role in improving learning outcomes (Wijaya, 2015). Student who involves actively during learning will have high interest and motivation to accept the concept (Wulandari, 2020).

The presentation of Edmodo is attractive and clear. Attractive learning media can increase student motivation to stay focus on learning media (Muyaroah, 2017). Some menus on Edmodo are easy to use. It was supported by the menu validation result on Edmodo which was categorized as very valid. The usage of Edmodo features is also very valid. the features used are assignments, comment section, sharing files, and agenda. Those features help teacher to create a virtual classroom with

good learning management. Sulisworo (2020) states that using features in learning media such as Edmodo can support student's critical thinking skills. It is because students involve actively in learning, so the optimal learning outcomes are obtained.

In the aspect of content, the average score is 3.91 and was categorized as very valid. The aspect validated on student worksheets is the appropriateness of material, material coherence, the truth of concept and theories, the clarity of images and video, and also the language used in the material. The content of the material is paying attention to the basic competency, indicators, and learning goals. Basic competency is an ability that needs to be achieved by students during learning. This ability can be achieved if students are showing changes in attitudes, knowledge, or skills according to indicators of competency achievement. The student who involves actively in learning shows changes in attitude, knowledge, and behavior (Savitri, 2019). If the indicators are achieved, the learning goals are also achieved. The appropriateness of the material is very valid. It indicates that the media fulfill basic competency, indicators of competency achievement, and learning goals. Thus, the media is suitable for learning because it is fulfilling the character of good learning media (Abidin, 2016).

The coherence of the material is very valid. According to Ummels and Kamp (2015), the coherence of material connecting students and concepts. Otherwise, students will find it difficult to explain and predict a phenomenon. The truth of the concept and theories were very valid. It is essential to avoid misconceptions among students. The clarity of images and videos was also very valid. Clear pictures and videos can strengthen student's memory. It also helps students understanding material because they can visualize abstract material such as the immune system (Puspita et al, 2017). The language clearness is categorized as very valid. It is developed at the student's cognitive level. The language score is supported by Widodo (2017) that states the language in media need to pay attention to correct spelling and clear sentences. The result of student worksheets validation showed in Table 7 below.

Table 7. Student worksheets validation result

No	Validation Criteria	Score			x
		V1	V2	V3	
A.	**Presentation**				

No	Validation Criteria	Score			x
		V1	V2	V3	
1.	The title of student worksheet match with learning topic that is immune system and immunization.	4	4	4	4.00
2.	The cover of student worksheet represents the material to be studied.	4	4	4	4.00
3.	On the cover there are title, identity of educational level, and student worksheets author.	4	4	4	4.00
4.	Images used in student worksheets represent content.	4	4	4	4.00
5	Availability of time allocation.	3	2	4	3.00
6.	Learning goals written in operational sentence.	4	4	4	4.00
7.	The guide of student worksheet is systematic and direct student when student using Edmodo.	3	2	4	3.00
8.	Activities on student worksheets utilize feature on Edmodo.	3	4	4	3.67
9.	Color, images, layout, text are clear and attractive.	3	4	4	3.67
	Average				3.90
B.	**Content**				
1.	The material present match with the learning topic.	4	4	4	4.00
2.	The material present match with the learning goals.	4	4	4	4.00

No	Validation Criteria	Score V1	V2	V3	x
3.	The material present match with the concept of immune system and immunization.	4	4	4	4.00
4.	Images present on student worksheet match with the immune system concept and immunization.	4	4	4	4.00
5.	The caption of images is right, clear, and easy to understand.	3	4	4	3.67
6.	Activities and question in student worksheets support achievement of knowledge and skill aspect.	4	4	4	4.00
7.	Activities and question in student worksheets match with learning goals that will be achieved.	4	4	4	4.00
	Average				3.95
C.	**Language**				
1.	The languages used match with General Guidelines for Indonesian Spelling (PUEBI).	4	4	4	4.00
2.	The language used is clear and easy to understand by student.	4	4	4	4.00
3.	The sentences used not containing bias or clear.	3	4	4	3.67
	Average				3.89
D.	**Critical thinking skills**				
1	Activities on student worksheets require student to be able to expressing the meaning of information or	3	4	4	3.67

No	Validation Criteria	Score V1	V2	V3	x
	interpretation skills.				
2.	Activities on student worksheets require student to be able to identifying the relation or analysis skills.	3	4	4	3.67
3.	Activities on student worksheets require student to be able to judging the statement or evaluation skills.	3	4	4	3.67
4.	Activities on student worksheets require student to be able to considering the statement to make conclusion or inference skills.	3	4	4	3.67
5.	Activities on student worksheets require student to be able to giving view or explaining or called as explanation skills.	3	4	4	3.67
	Average				3.67
	Overall average				**3.85**

Note:
V1: Material expert lecture
V2: Media expert lecture
V3: Biology teacher

The total average score of student worksheets validation is 3.79 with a very valid category. The aspect validated are presentation, content, language, and critical thinking skills. Categorized as very valid, the student worksheet is feasible to use in learning. Using student worksheets that are categorized as very valid on immune system material is effective in learning (Jayanti et al, 2017). Developing student worksheets need to consider on didactic, construction, and technical component. The

didactic component is related to curriculum suitability. The curriculum suitability consists of competency standards, basic competency, and indicators of competency achievement. Those will help students to find concepts. The construction component is related to the language and sentences structure. The technical component is related to the design, layout, and drawing compatibility on student worksheets (Fitriyah, 2019). On the other hand, Puspitasari (2018) states that student worksheets need to pay attention on learning outcomes, presentation, language, and learning material.

The presentation aspect scored 3.90 and is categorized as very valid. This score showed if the student worksheet has fulfilled the presentation aspect element. It consists of the title's suitability, design, the identity of the academic unit, time allocation, learning goals, guidelines, and activities that utilize some features on Edmodo. The lowest score at this aspect is time allocation and guidelines. Both of them scored 3.00 and are categorized as valid. The researcher develops student worksheets only for 45 minutes in each meeting. This time allocation is way too short, so the student probably could not be able to understand the subject (Maulidiyah et al, 2012). Students would feel pressured and lost motivation to learn the concept. After receiving expert suggestions, the time allocation changed to 70 minutes. The guideline is also scored low. The guideline was written on the fourth page of the student worksheets. It can be used by students to guide them when using Edmodo. However, this guideline is not really clear because some sentences are confusing. Another reason is the pictures inputted on the student worksheets' guideline and Edmodo's actual view seems a little bit different. Due to these reasons, the researcher was revising the guideline with simpler sentences and adding suitable pictures.

On the other hand, the design of student worksheets is clear and precise. It can increase student's learning motivation when using student worksheets (Syamsu, 2017). The average score of content is 3.95. The student worksheet is following basic competency, indicators of competency achievement, and learning goals so it is possible to get a high score. This result is supported by Irfana (2019) who states a good student worksheet should pay attention to the basic competency in order to achieve learning goals. For the linguistic aspect, the average score is 3.89 and is categorized as very valid. However, this score is not perfect because there are some sentences that have a bias in student worksheets. The sentences should be corrected, so the student would understand. Widodo (2017) said that a good student worksheet must be clear, simple, and following the student's ability.

The critical thinking skill aspect scored 3.67 and is categorized as very valid. The student worksheet that developed was using scientific approach. It consists of observing, questioning, collecting data, reasoning, and communicating. Scientific approach can improve student's critical thinking skills because students are trained to express or explain an event (Yustyan et al, 2015). According to Lismaya (2019), indicators of critical thinking are the ability of interpreting problems, solve problems by linking concepts, testing the truth of statements, drawing logical conclusions, and explaining reason according to concepts or evidence. The student worksheets developed contain several questions that stimulate student's critical thinking on each indicator. The questions developed is related with the immune system and daily problems. According to the result of Sartono's research (2017), linking the immune system and daily activities on student worksheets can improve analytical thinking skills. It is because students can find the answer based on information obtained.

After the learning process, students were asked to filled out a questionnaire. The questions on questionnaire were asking about student experience when using Edmodo. This questionnaire result is 88.03% and categorized as very practical (Riduwan, 2019). The questionnaire statements are showed in Table 8 below.

Table 8. The student response recapitulation

No	Statement	Eligibility Percentage	Category
1	The ease of access Edmodo as the learning media.	72.2%	Practical
2	Edmodo view is easy to understand and use.	72.2%	Practical
3	The presentation or view of Edmodo is attractive.	100%	Practical
4	Features on Edmodo support learning. (Feature such as video, images, quiz, and assignment)	88.9%	Practical
5	The language used in learning is easy to understand.	100%	Practical
6	The activities arrangement during learning on Edmodo is	100%	Practical

No	Statement	Eligibility Percentage	Category
	direct student to learn in group or discussion.		
7	Edmodo in the learning process helps students understanding the learning materials.	72.2%	Practical
8	Powerpoint presentation used in Edmodo is attractive from the design and colors.	100%	Practical
9	Learning using Edmodo trains interpretation skills.	88.9%	Practical
10	Learning using Edmodo trains analysis skills.	88.9%	Practical
11	Learning using Edmodo trains evaluation skills.	88.9%	Practical
12	Learning using Edmodo trains inference skills.	83.3%	Practical
13	Learning using Edmodo trains explanation skills.	88.9%	Practical
	Average	88.03%	Practical

The result of student responses showed that Edmodo is suitable for learning. The highest score is found in several aspects such as presentation, language, activity arrangement, and attractive learning material. The presentation or the appearance of Edmodo is interesting. This aspect can increase student's motivation during learning. According to Astatin (2016), thee attractive learning media is effective to use in learning. It can be seen from the ability of students to mastery the concept that showed in scores increasing before and after use learning media. The aspect of activity arrangement got a perfect score. This score is supported by Puspita et al (2017), the media that involves active student role in learning is showed positive responses from students.

In contrast, the lowest score is including media ease, display, and usage. Sometimes, the media is not available for students because of unstable internet networks. Due to that reason, some students choosing "no" for media easiness. The display of Edmodo is quite fascinating but some students are not familiar with it. This resulting some students having a hard time using Edmodo. Based on the problems, it is necessary to have a virtual meeting before learning or a guidebook, so the students would be able to use Edmodo correctly. Using guidelines book on Edmodo can help students to more understanding feature usage on it (Aeni et al, 2017). To achieve learning goals on basic competency using Edmodo and student worksheets is still need other media helps to support the learning process, such as PowerPoint, video, or picture.

CONCLUSION

This research produces Edmodo that is equipped with student worksheets to train critical thinking skills. The validity of Edmodo as the learning media and student worksheets to train critical thinking skills on the immune system material for eleventh-grade high school students is very valid and suitable for learning activity. The Edmodo validity scored 3.88 on the presentation aspect, 3.91 on content, and 3,89 for the overall average. On the other hand, the student worksheet scored 3.90 on presentation, 3.95 on content, 3,89 on language, 3.67 on critical thinking, and 3,85 for the overall average. These products also declare as practical according to the student response questionnaire of 88.03% and suitable for the learning process.

SUGGESTION

This research has not at the broad trial stage. Further research expected to apply this media to a wider area to know its effectiveness, and media can use as the learning media that trains critical thinking skills in schools.

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