

PENGEMBANGAN MEDIA PEMBELAJARAN KARTU MAKE A-MATCH PADA MATERI JARINGAN HEWAN UNTUK MENINGKATKAN HASIL BELAJAR KOGNITIF***The Development of Make a Match Card Learning Media on Animal Tissue Material to Improve Cognitive Learning Results*****Zaida Fithrotul 'Ilma**Biology Departement, Faculty of Mathematics and Natural Sciences, State University of Surabaya
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Email: firaskhaleyla@unesa.ac.id**Abstrak**

Sistem pendidikan diartikan sebagai sebuah proses dalam mendapatkan sesuatu yang baru, di mana proses tersebut dapat mengembangkan potensi dalam diri kemudian dapat meningkatkan minat belajar siswa. Meningkatnya minat belajar siswa akan berdampak baik bagi kegiatan belajar mengajar sehingga hasil belajar dapat tercapai. Pembelajaran yang selama ini dilakukan terkesan masih kurang optimal, sementara siswa dituntut untuk menguasai semua konsep yang ada, khususnya pada materi Jaringan Hewan. Kurang optimalnya media pembelajaran menjadi salah satu alasan mengapa hasil belajar siswa menurun. Untuk itu dibutuhkan media pembelajaran yang dapat berperan sebagai jembatan pemahaman konsep. Tujuan penelitian ini yaitu untuk mendeskripsikan tingkat keefektifan dan kepraktisan penggunaan media pembelajaran kartu *Make a-Match* pada materi Jaringan Hewan. Penelitian ini termasuk penelitian deskriptif kuantitatif. Model yang digunakan yaitu *ASSURE* dengan enam tahapan. Rancangan penelitian ini menggunakan rancangan *one group pretest-posttest design*. Uji coba dilaksanakan di XI MIPA 4 SMAN 8 Surabaya. Instrumen penelitian meliputi lembar tes, validasi, observasi, dan respon siswa. Hasil menunjukkan bahwa ketuntasan indikator mendapat skor sebesar 75 % dengan kategori tuntas, validasi mendapat skor sebesar 79.3% dengan kategori valid, observasi keterlaksanaan sebesar 100 % dengan kategori sangat baik, dan respon siswa sebesar 94.5% dengan kategori sangat praktis. Dengan demikian media pembelajaran Kartu *Make a-Match* dapat digunakan untuk proses pembelajaran di sekolah.

Kata Kunci: Kartu *Make a-Match*, Jaringan Hewan, Hasil Belajar Kognitif**Abstract**

The education system is defined as a process of learning something new, where the process can develop the potential within and then increase student interest in learning. Increasing students' learning interest will have a good impact on teaching and learning activities so that learning results can be achieved. The learning that has been carried out so far seems to be still less than optimal, while students are required to master all existing concepts, especially on Animal Tissue material. In addition, the lack of optimal learning media is one of the reasons why student learning results' decline. For that, it takes a learning media that can act as a bridge to understanding the concepts. The purpose of this research was to describe the level of effectiveness and practicality of using the *Make a-Match* cards on Animal Tissue material. This research was quantitative descriptive research. The model used was *ASSURE* with six stages. This study used a *one group pretest-posttest design*. The trial was carried out at XI MIPA 4 SMAN 8 Surabaya. Research instruments included test sheets, validation, observation, and student responses. The results showed that the completeness indicator scores 75% in the complete category, validation scores 79.3% in the valid category, the implementation observation was 100% in the very good category, and student responses were 94.5% in the very practical category. Thus, the *Make a-Match* Card learning media can be used for the learning process at school.

Keywords: *Make a-Match* Card, Animal Tissue, Cognitive Learning Result**INTRODUCTION**

The learning process is one of the systems in learning. In the learning process, the role of learning devices is very important and influential for student

learning outcomes (Nabila, 2018). In the learning process itself, several weaknesses will be experienced by the teacher, one of which is the teacher is difficult to check students' understanding of a concept. Students who are involved in the learning process often feel that learning is

a burden rather than an effort to be active in deepening knowledge as a result of low student interest in learning, because students feel burdened and they are bored with what they are doing. Lack of understanding of concepts and low interest in learning can make it difficult for students to receive subject matter (Auwaliyah, 2017).

According to Law number 20 2003, Article 4 paragraph 4 states that education is held by setting an example, building the will, and developing the creativity of students in the learning process. Based on the article in the Act shows that the education system must be based as a process in getting something new, where the process can develop potential in the future can then increase students' learning interest. With the increasing the learning, it will have a good impact on the learning process in the future. To support, it takes a learning media that can able to motivate student learning and used as a bridge to understands the concepts. Meanwhile, the media is an integral part of the overall teaching situation, so the media is one of the elements that must be developed by teachers to help enhance the quality of teaching and learning. If the media carries messages or information that has instructional purposes or contains learning purposes, it is called learning media. Lack of use of learning media can cause students to become bored, passive, lose motivation, interest, and enthusiasm to participate in learning activities (Megawati, 2019). The learning media has benefits and advantages, like easier for teachers to convey material, students more enthusiastic, being able to activate all the senses, and to build the real experiences. With the use of learning media, learning becomes active and fun and can make students more enthusiastic and able to receive the material to the maximum (Oktavia, A. & Agustin, H., 2020). The media used must be in accordance with the current character of students because the media is a device that can stimulate students to learn (Sulfemi & Mayasari, 2019). One of the media that can stimulate students to learn is card media.

Card games can be used as learning media because there are messages to be conveyed through the images contained in the card or it can be said that the card can be used as a communication tool with other people (Puspita et al., 2016). Card media is categorized as visual media which can strengthen students' memory and sharpen their understanding (Sudiarsini, et al, 2016). The cards used can also have a big influence on the learning process besides the cards used must be in accordance with the learning objectives, namely clear, easy to use, inexpensive, and effective (Utami, 2018). Media in the form of educational game cards is very suitable for conveying material, knowledge,

understanding concepts, and being able to train students' skills, besides that card media attracts students' attention so that it can increase students' enthusiasm for learning (Sari, et al, 2018). This card media can be combined with existing learning models, one of which is Make a -Match.

Make a-Match is a type of cooperative learning, namely by pairing cards so that students can find a concept of the material being taught (Kesumaningrum,dkk, 2016). If learning is designed using the *Make a-Match* then will seem fun and with the use of picture cards media can convey instructional messages, describe a feeling, create an active and happy learning atmosphere, so that students feel motivated in learning and the desired learning outcomes can be realized (Muah, 2016). Using the *Make a-Match* is one of the solution for students who have difficulty mastering certain concepts because by using the Make a- Match cards, learning becomes fun and students will find it easier to understand the material being taught (Zulhelmi, 2017).

The learning materials are selected based on the results of observations that have been carried out with the results that Animal Tissue material is considered to be taught more using the lecture method and reading the textbooks so that the cognitive learning results were low. And the teacher had never used any learning media it only used the powerpoint in Google Classroom.

With reviews related to learning that exist today, the learning process seems still less even though the sub-material contained in it is quite a lot, while students were required to master all existing concepts. In the actual conditions the teacher also finds it difficult to convey the material due to time constraints in the learning process. Furthermore, the learning media was needed to support learning activities.

Animal Tissue material needed to be more understood because it was related to life. It requires an understanding of the concept, as it has many Latin names. In addition, this Animal Tissue material is very suitable to be applied through in *Make a-Match* card.

This study aimed to describe the effectiveness and practicality of using the *Make a-Match* in Animal Tissue material. This research was expected to improve the learning process thus learning objectives could be achieved optimally.

METHOD

This research was a quantitative descriptive research. The model used was *ASSURE* with six stages. *Analyze, State Objective, Select Method, Media and Material, Utilize Materials, Require Learner Participant, and Evaluate and Revise*. The design of

this study used a *one group pretest-posttest design*. The trial was carried out at XI MIPA 4 SMAN 8 Surabaya as presented in Table 1. Data collection techniques used were through test methods, validation, observation, and student response.

Pretest	Treatment	Posttest
O ₁	X	O ₂

Table 1. Design Research

The test method was used to find out the completion of indicators following indicator completion criteria as presented in Table 2. The completion of the indicator was declared as complete if students obtained a minimum score of 75%.

Percentage (%)	Interpretation Criteria
0 - 48	Not Completed
49 - 61	Less Completed
62 - 74	Enough Completed
75 - 87	Completed
88 - 100	Very Completed

Table 2. Indicator Completion Criteria (Sugiyono, 2013)

Validation was used to find out the feasibility of the *Make a-Match Card Learning Media* used. The criteria for interpreting the validity of the media is presented in Table 3. The learning medium of the *Make a-Match Card* was categorized as Valid if it obtained a validity percentage above 70%.

Table 3. The Criteria for Interpreting The Validity

Percentage (%)	Category
0 - 56	Not Valid
56 - 70	Less Valid
70 - 86	Valid
86 - 100	Very Valid

Media

Observation of implementation was used to evaluate the implementation of the learning process carried out by the teacher. The interpretation criteria for implementation is presented in Table 4. Learning was deemed well implemented when observation of implementation reached a percentage of $\geq 70\%$.

Table 4. Interpretation Criteria for Implementation

Percentage (%)	Interpretation Criteria
30 - 50	Not Good
51 - 69	Enough Good
70 - 85	Good
86 - 100	Very Good

Student response questionnaires were used to find out student responses after using card media as presented in Table 5. The learning media was declared practical if the student's response reached a percentage of $\geq 70\%$.

Table 5. Criteria for Interpreting Student Response

Percentage (%)	Category
30 - 50	Less Practical
51 - 69	Enough Practical
70 - 85	Practical
86 - 100	Very Practical

RESULT AND DISCUSSION

Make a-Match Card Learning Media that has been developed by researchers is as presented in Figure 1 and 2.

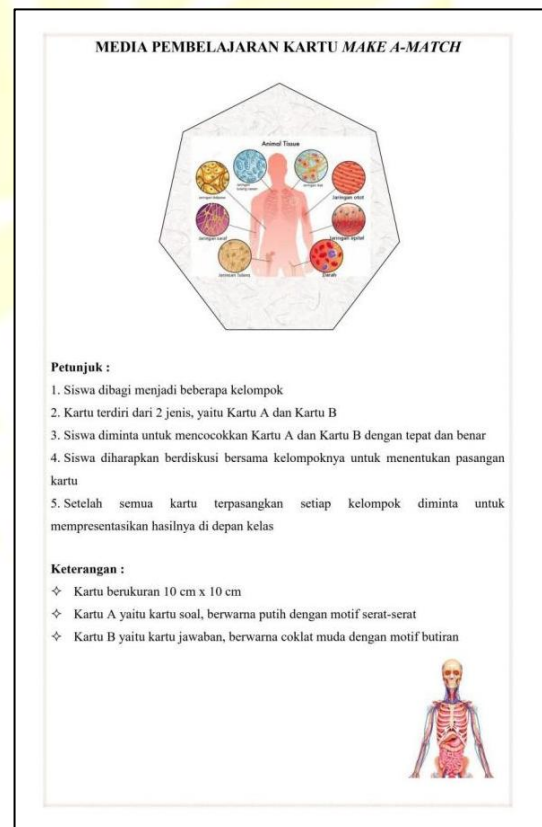


Figure 1. Introduction *Make a-Match* card media



Figure 2. Make a-Match cards

1. Test

Test methods are used to determine the level of understanding of students as presented in Table 6.

Table 6. Summary Of Test Method Results

Aspect	Pretest	Posttest
Number of students	20	20
Number of questions	10	10
Highest value	72	94
Lowest value	46	70
Total value	1146	1648
Average	57,4 %	82,4 %
N-Gain	0,595	
Complete Criteria	75 %	
Category	Completed	

Test method used can determine the extent of understanding possessed by students, with the use of *pretest-posttest* method, learning outcomes of students are more controlled. This is supported by cognitivism learning theory which said that it is better to prioritize learning process than its result. Learning does not only involve a stimulus and then a response, but also the occurrence of a good learning process based on a very complex mindset (Tiara, et al. 2020). This theory of cognitivism is classified as meaningful learning, finding something new will result in more impression so that the resulting cognitive effects will last a long time, for example to understand concepts, critical thinking skills, and improving other cognitive skills (Wibowo, H., 2020)

In *pretest* activity, many students did not understand and master the Animal Tissue material, as known from the number of students who had not completed the indicator achievement. The scores obtained by most students were still below the applicable standard at the school as shown in Table 6. The highest score obtained at the *pretest* was 72 while the standard of completeness indicators / KKM applicable was 75. To improve student learning results, students used *Make a-*

Match card learning media to better master the materials being taught.

After using the *Make a-Match* card learning media, students conducted *posttest* with the aim of knowing the changes or improvements in the understanding of the material. Based on the results in Table 6, the highest score obtained by students in the *posttest* was 100 and the lowest score obtained was 94. Thus, many students experienced an increase in the indicator completeness. With changes in the completeness of indicators experienced by students, it showed that the use of learning media had a good impact on students. In addition, students also experience an increase in learning outcomes, this is in accordance with the opinion of (Nurhadi, 2018) that the learning process is an understanding process whose changing effects are seen by understanding the concept of thinking, not changes in behavior that appear physically.

Completeness of student indicators can be known through the calculation of *N-gain* or *Normalized Gain* by calculating the difference between the *pretest* and *posttest* scores. *N-gain* serves as a measuring tool for evaluating cognitive knowledge obtained by students by calculating the value of the difference, to indicate the effectiveness of using the previous learning media. The completion of the indicators obtained was 75%, it showed that most of the students have scored above the KKM, which was 15 people, while for 5 people the indicators were still not complete (Table 6).

2. Validation

The validation method was carried out by 2 lecturers from the Department of Biology and 1 teacher from SMAN 8 Surabaya as presented in Table 7.

Table 7. Validation Results Summary

Aspect	V1	V2	V3
Contents	30	36	29
Presentation	10	14	12
Language	16	17	15
Learning Strategy	12	13	11
Overall View	12	11	12
Total	80	91	79
Average	76.1 %	86.7%	75.2%
Average Total	79.3 %		
Category	Valid		

To support the completeness of indicators effective learning media for students was required. The learning media developed had been assessed and categorized as valid with a score of 79.3%, which means that the *Make a-Match* was suitable for use as learning media in schools *Make a-Match* card could also improve students cognitive learning results in line with (Tiara, et al. 2020) who said that the use of *Make a-Match* serves as an intermediary for delivering material, students

become enthusiastic in learning activities, fostering a sense of cooperation between students in finding the appropriate pair of cards and learning activities become more memorable.

3. Implementation Observation Method

Implementation observation was used to determine the implementation of learning that has been designed by the teacher as presented in Table 8.

Table 8. Results of Observation of Implementation

Stages	Completed
Opening activities	100%
Core activities	100%
Closing activities	100%
Use of media	100%
Avarage	100%
Category	Very Good

In the process of data collection observation sheet of implementation was also used. The sheet was used as a guide in every step of the learning activity from the opening to the end of the activity. This implementation observation sheet was also used to find out the process of implementing learning in the classroom using the *Make a-Match* card learning media. The score on the implementation observation sheet was 100% in the very good category. This showed that the *Make a-Match* was suitable for improving student learning results and making the classroom atmosphere more active. This is supported by (Pinar, 2019) which says that learning media is needed to support teachers in the learning process, help convey messages and information that may not be conveyed verbally but can be conveyed through the *Make a-Match* card media.

4. Student Response Questionnaire Method Student

Response questionnaires were used to determine student responses as presented in Table 9.

Table 9. Student Response Questionnaire Results

Statement	Response	
	Positive	Negative
Card media is easy to use	100%	-
Card media may improve cognitive learning outcomes	95%	5%
Card media adds insight and knowledge	100%	-
Interesting designs and images	100%	-
Text, writing, color accordingly	95%	5%
Card media matches the concept of material	90%	10%

The material taught is easy to understand	100%	-
Boring card media	90%	10%
Card media cannot be used on other materials	85%	15%
Card media makes more excited	90%	10%
Avarage	94.5%	
Category	Very Practical	

After that, a student response questionnaire was also used which resulted in score of 94.5% in the very practical category. *Make a-Match* card learning media were had positive effect. Students also gave advice on what they felt was lacking in this card media. *Make a-Match* card media was able to increase learning activities to be more active, make it easier to find new concepts, solve problems, train students independences, and the learning process is student centered (Pratiwi, et.al, 2021). The cards media used was suitable with the concept of Animal Tissue material so that can be applied in schools (Su, T., et al. 2014).

Several students gave negative responses regarding the card media. Students said that this card media could not directly improve learning results, because they had not mastered the material being taught. In addition, there were also students who said that the available card media still tended to be monotonous and boring because the questions contained in the cards used too many sentences caused students to have difficulty understanding and matching the cards.

The data collection method could be used to strengthen this research. The purpose of this study was to find out how much the level of effectiveness and practicality of using the *Make a-Match*. In this study the card media was able to and was feasible to be used as a medium of learning in schools. This is also in accordance with previous research conducted by (Sari, D.V.,2018) which stated that the *Make a-Match* had a positive effect on student learning outcomes and could be used in schools. However, apart from this, in this study there were quite different comparisons seen from the results of data collection carried out, previous studies aimed to determine the effectiveness of the *Make a-Match* in terms of learning outcomes and student responses. *Make a-Match* card developed can still be used as a proper learning medium. However, it should also be noted that the use of the font size in the text should be clearer to make it easier for students to find pairs of cards.

CLOSING**Conclusion**

Based on the results of research that has been conducted in class XI MIPA 4 SMAN 8 Surabaya it can be concluded that the use of *Make a-Match* card learning media could be used in learning activities and could improve students cognitive learning results. This was known based on the results of the completion of indicators during the learning process that obtained a percentage of 75% with the complete category, the results of validation of media use obtained a percentage of 79.3% with valid categories, the results of observation of implementation obtained a percentage of 100% with excellent categories, and the results of student response questionnaires obtained a percentage of 94.5% with very practical categories.

Suggestion

At the time of using the learning medium *Make a-Match* card the teacher is expected to have a little patience for classroom conditioning because students tend to be less conducive when playing this learning card. Before starting learning, students should learn first because this card does not directly improve student learning outcomes but requires a process for understanding a concept.

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