THE DEVELOPMENT OF THE IDENTIFICATION KEY CIRCLE MEDIA FOR THE SKILLS OF CLASSIFYING ANIMALS AND STUDENTS' UNDERSTANDING OF CONCEPTS

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Abstract: This research is motivated by the low skill of classifying animals and the low understanding of students' concepts. Preliminary data show that out of 10 groups only 2 groups are skilled in classifying animals. Therefore, this research was conducted to improve the skills of classifying animals and understanding concepts by using the identification key circle media. The research subjects were 36 students of class VII A of SMPN 4 Kuningan. The research data was obtained from the observation of the students' skills in classifying animals and the concept understanding test. Based on the results of the study, it was found that the skill in classifying animals had increased through the Wilcoxon test, the statistical value of the asymp value was obtained. Sig of 0.01. The working hypothesis will be accepted if the value of asymp.sig < , and the value of = 0.05, because the value of asymp.sig = 0.01 <0.05 then Ha is accepted, and an increase in students' understanding of concepts from the final data analysis shows that obtained based on the Independent sample test output table in the equal variances assumed section, the Sig value is known. (2-tailed) of 0.00 < 0.005, so as for decision making in the independent sample t-test, it can be concluded that Ho is rejected and Ha is accepted. Thus, it can be concluded that the identification key circle media can improve students' skills in classifying animals and understanding draft.
Keywords: *Key circle media identification; animal classification skills; student concept understanding.*

INTRODUCTION

Learning media is growing rapidly with advances in technology and science, especially audio-visual learning media. Learning media is a means of conveying messages in the form of physical tools that can help and facilitate the teaching and learning process with the aim of improving the quality and process and being able to arouse student interest in learning, in line with the opinion (Arsyad, 2017) that learning media are everything that can be used. in the teaching and learning process so that it can stimulate students' attention and interest in learning. It is realized that effective learning needs to be supported by media that can make it easier for students to classify animals, this is because learning in the classroom tends to be conventional (teacher-centered) and less student-oriented (Hernandez-Matias, Laureano-Torres, Washington, Perez-Donato, Calzada-Jorge, Borrero, Roman, and Mendoza, 2019). As stated by Arsyad (2017), teachers need intermediaries or mediators so that learning takes place more effectively. The benefits of using media in learning as stated by Gintings (2014) are that the media can indirectly be used as a scenario that directs the course of the learning and learning process as planned, therefore experience shows that by using good media and in the right way the material that presented more easily accepted by students. Clearly, the use of learning methods cannot stand alone because the media is also required as a tool to convey materials or information to students (Puspitarini & Hanif, 2019).

Learning in the classroom using learning media helps students to be more motivated to learn. The learning media used must be attractive, easy to use, inexpensive to obtain and enthusiastic in participating in learning.

Learning on the concept of classical animal classification every year always uses the key of determination. It facilitates the identification of biological entities (e.g. plants, animals, fungi or animal tracks) (Torkar, 2021). The use of the key of determination is expected that students are more motivated to learn in line with Watson & Miller (2009). The use of the key of determination in learning has advantages because it develops

students' reasoning processes, motivates students to learn and makes it easier for students to understand, compare and analyze the material being studied.

Semsar & Casagrand (2017) stated, when applying identification key, one first identifies classifying characteristics, those features of the items that create large distinctions among groups of items, until all items can be uniquely referenced.

Understanding of the identification key enables better understanding of a vast amount of information and how to organize, compare, differentiate, and analyze that information (Cepeda, Martin, Britayev, Al-Aidaroos, and Lattig (2017). Identification key mastery provides a way for biology students to identify any organism presented to them (Anđić, Cvijetićanin, Maričić, and Stešević, (2019).

In previous study, specifically on the concept of classification using the key of identification in biology students conducted by Papilaya (2020), it was found that student learning outcomes were very low. Similarly, in this research, the use of the key of determination for 7th graders is still very difficult to feel in class, especially in learning the concept of classification in animals, in the last 3 years on average out of 10 groups only 2 groups were able to classify animals correctly. Students seem still confused by the use of the key of determination, so that the learning process in the classroom is not conducive.

The problems faced must be given the right solution, how to solve the problems that occur when learning about animal classification material using the key of determination. This motivates them to continue digging for information and looking for research journals that lead to this.

Departing from an understanding of the role and benefits of media in learning, the idea emerged to create or develop existing learning media that are expected to be a solution to these problems. The media or learning aids in question are made of electronic devices, namely compact discs (CD) or used digital video discs (DVD), which are named the Identification Key Circle (Likuden). Likuden is made with his own creativity, in which there are hints of animal characteristics. The characteristics of the media are visual media which contain the characteristics of animals and are used in a circular way starting from the smallest circle, rotating sequentially until they find their phylum or class.

The objectives of this research are: 1) to analyze the function of the identification key circle media in achieving the learning objectives of animal classification; 2) analyze the improvement of animal classification skills after using the identification key circle media; 3) analyzing the increasing understanding of students' concepts after the implementation of the identification key circle media; 4) analyze students' positive response to the development of identification key media to improve animal classification skills and students' understanding of animal classification concepts.

METHOD

This research method is an experimental method with this type of research using Research and Development (R&D). The research design used is the Pretest-Posttest Group Design. In the design, there were two groups that were selected purposively, then both groups were given a pretest to determine whether there was a difference between the experimental group and the control group in the initial state. Pretest results are good if the experimental group is not significantly different. The effect of treatment is (O2-O1) – (O4-O3) (Sugiyono, 2018). The place of implementation is at SMP Negeri 4 Kuningan. The time of the research was carried out in December 2020 s.d. March 2021.

Table 1. *Collecting data technique*

No	Techniques	Instrument	Data Type	Data Source
1	Written test	Multiple choice test	Student answer scores to determine the increase in students' understanding of concepts	Students
2	Observation	Rubric	Rubric is used to assess students' classification skills	Students
3	Validation	Validation Sheet	Validation score of media instrument	Validator
4	Observation	Observation Sheet	Observation sheet is used to analyze the implementation of learning process activities using media	Teacher and student
5	Questionnaire	Questionnaire Sheet	Questionnaire sheet is used to analyze student responses in participating in learning	Students

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RESULTS AND DISCUSSION

Classification skills are measured using a rubric. The rubric is used to observe students' skills in classifying animals in the learning process. The indicators that were observed and assessed in the process of classifying animals were observing similarities, looking for differences, comparing, contrasting, and looking for the basis for classifying. The results of students' skills in classifying are presented in the following picture:

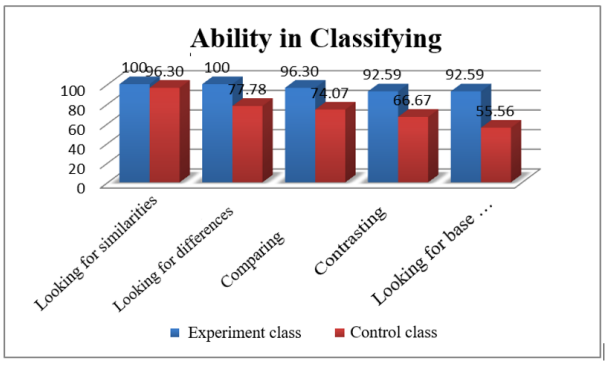

Figure 1. *Graph of classification skill results*

Based on Figure 1, it shows that in general the classification skills on all indicators are higher in the experimental class compared to the control class. The indicator looking for similarities and looking for differences in the experimental class has the highest value compared to other indicators, and the comparison with all indicators with each other is not too far away.

The value of students' skills in classifying is carried out by testing the difference in skill scores using the Wilcoxon test, while the results are in the table as follows:

Table 2. *Result of Wilcoxon test*

Ranks				
		N	Mean Rank	Sum of Ranks
Experiment – Control	Negative Ranks	1[a]	1.00	1.00
	Positive Ranks	8[b]	5.50	44.00
	Ties	0[c]		
	Total	9		
a. Experiment < Control				
b. Experiment > Control				
c. Experiment = Control				

Table 3. *Test statistics*

Test Statistics[a]	
	Experiment – Control
Z	-2.567[b]
Asymp. Sig. (2-tailed)	.010
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

From table 2 and table 3, the results are: the difference between the control variable and the experimental variable that is negative is 1 observation or in other words there is 1 observation on the experimental variable from observations on the control variable, while the average rank = 1 with the number of negative ratings = 1. For the difference between control variables and positive experimental variables, there are 8 observations or in other words, there are 8 observations on the experimental variables which are more than the observations on the control variables with the average rank = 5.50 and the number of positive ratings = 44.00. For the value there is no difference between the control variable and the experimental variable as much as 0 observations.

For statistical value obtained asymp value. Sig of 0.01. The working hypothesis will be accepted if the value of asymp.sig <, and the value of = 0.05. Because the value of asymp.sig = 0.01 <0.05, Ha is accepted, which means that there is an increase in classifying skills by using the identification key circle media. (Data obtained by calculation of SPSS version 23).

At the time of learning by using the learning media the identification key circle of students looked enthusiastic and interested in the existence of the media, they took turns trying each other, this shows that the media provides a new color in the teaching and learning process for students. In line with the research results of Purnamasari (2012), observing the pictures of living things in the media and students are required to group these pictures using the key of determination, inspire enthusiasm and increase students' motivation to learn. According to Lisa (2018), using the key of determination as a learning medium in biology, students not only estimate the facts and concepts they know, but they are also invited to prove for themselves every feature of the dichotomy that has been made in the key to the determination of the objects they observe.

The results of students' conceptual understanding were measured using a multiple choice test instrument. The results of the multiple choice test instrument were divided into two, namely pretest and posttest as a comparison of students' conceptual understanding before and after using the identification key circle media in two classes, namely the experimental class and the control class. Indicators for measuring concept understanding in the form of multiple choice tests consist of: classification, giving examples, comparing and concluding. The results of the retest scores for each indicator in the control class and experimental class are shown in Figure 2 below:

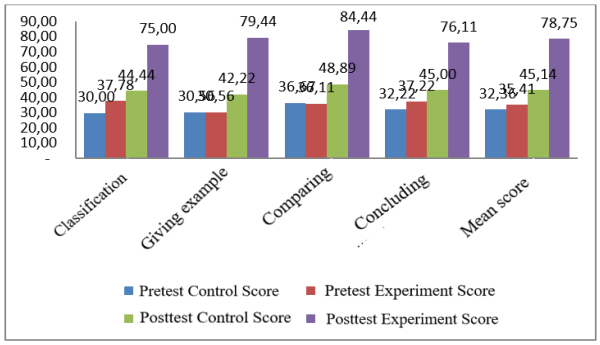

Figure 2. *Graph of student concept understanding results*

Based on Figure 2. it can be seen that the results of the students' initial ability to understand concepts through the pretest show an average score that is not much different. This shows that the control class and the experimental class have the same initial ability. The comparison indicator in the control class has the highest value, while in the experimental class the classification indicator has the highest value. The lowest indicator in the control class lies in the classification indicator, while in the experimental class there is an indicator for giving samples.

The results of the posttest understanding of students' concepts in general can be stated that the average score of the experimental class is greater than that of the control class. The indicator that has a greater value than other indicators in the control class and experimental class is the comparing indicator. Meanwhile, the lowest indicator in the control class is the sample giving indicator, while in the experimental class the indicator with the lowest score is the conclusion indicator.

To test the difference between the two averages between the control class and the experimental class, the independent sample t-test was used. From the calculation of the independent sample t-test using SPSS version 23, the following results were obtained:

Table 4. *Calculation results of t-test concept understanding*

Group Statistics					
	Class	N	Mean	Std. Deviation	Std Error Mean
Comprehension result Concept	Experiment Control	36 36	78.7500 45.1389	8.05118 11.74041	1.34186 1.95674

Table 5. *Independent sample test*

		Leven's test equality of variances		T-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. Error Difference	96% confidence interval of the difference	
									Lower	Upper
Concept Comprehension Result	Equal variances assumed	3.564	.063	14.166	70	.000	33.61111	2.37264	28.87903	38.34319
	Equal variances assumed			14.166	61.957	.000	33.61111	2.37264	28.86821	38.35401

Based on table 4 and 5, the output group statistic is known that the amount of data from understanding the concepts of the experimental class and control class is 36 students, the average value of understanding the concept of the experimental class is 78.75 while the average result of understanding the concept of 45.13, thus descriptive statistics, it can be concluded that there is an average difference in the results of understanding the concept between the experimental class and the control class. As for

proving a significant difference or not, it can be seen from the second output table.

Based on the output above, it is known the value of Sig. Levene's Test for Equality of Variances is 0.063 > 0.05, it means that the data variance between the experimental class and the control class is homogeneous or the same. Based on the Independent sample test output table in the equal variances assumed section, it is known that the value of Sig. (2-tailed) of 0.00 < 0.005, so as in decision making in the independent sample t-test, it can be concluded that Ho is rejected and Ha is accepted. This means that the value of the students' conceptual understanding using the identification key circle media is better than the value of the students' concept understanding results that do not use the identification key circle media.

From the results of the research on student responses in the use of the identification key circle media which was carried out in the experimental class the students really appreciated and were very happy in using the identification key circle media. This is known from the positive response they gave to each indicator contained in the questionnaire provided. The indicator with the greatest value is the happy indicator in using the identification key circle media by 100%, then the ease of use indicator of the identification key circle media and the identification key circle media indicator that can be used anywhere by 99%, then the attractiveness indicator of the identification key circle media display and the indicator of using the language of the identification key circle media is 98%, after that the cheap indicator to make the identification key circle media is 96%, then the clarity of the text / writing in the identification key circle media is 95%, while the identification key circle media indicator provides convenience in classifying animals and the indicator of the suitability of the identification key circle media with animal characteristics is 90%, while the understanding indicator in using the identification key circle media only gets a score of 88%. In the indicator of understanding in using the identification key circle media in classroom implementation, students still do not understand in identifying the characteristics of invertebrate animals, especially those that live in the sea, this is because students do not really know about these animals, so that with a lack of or not knowing the animal directly hinders identifying the animal.

CONCLUSION

The identification key circle media after being implemented in learning the concept of animal classification can achieve learning objectives, improve students' skills in classifying and understanding students' concepts. With the use of the identification key circle media, the experimental class had higher classification skills and concept understanding compared to the control class.

REFERENCES

Anđić, B., Cvijetićanin, S., Maričić, M., and Stešević, D. (2019). The contribution of dichotomous keys to the quality of biological-botanical knowledge of eighth grade students. *Journal of Biological Education, 53*(3), pp. 310-326.

Cepeda, D., Martin, D., Britayev, T.A.A., Al-Aidaroos, M., and Lattig, P. (2017). Haplosyllis (Annelida: Syllidae) from Saudi Arabian Red Sea, with the description of a new endosymbiotic species and a dichotomous key for the Indo-Pacific species. *Marine Biodiversity, 47*(4), pp. 1123-1129.

Gintings, A. (2014). *Esensi Praktis Belajar & Pembelajaran.* Bandung: Humaniora.

Hernandez-Matias, L., Laureano-Torres, F., Washington, A.V., Perez-Donato, L., Calzada-Jorge, N., Borrero, M., Roman, P.L., and Mendoza, S. (2019). An exploratory study comparing students' science identity perceptions derived from a hands-on research and nonresearch-based summer learning experience. *Biochemistry and Molecular Biology Education, 48*, pp. 134-142.

Papilaya, P. M. (2020). Field trips strategies and keys to determination on discovery learning in lower-plants botany. *Journal of Southwest Jiaotong University, 55*(4), 1-12.

Purnamasari, H. (2012). Kunci determinasi dan flashcard sebagai media pembelajaran Inkuiri klasifikasi makhluk hidup SMP. *Ennes Science Education Journal. USEJ 1*(2). Hal. 103-110.

Puspitarini, Y. D., & Hanif, M. (2019). Using learning media to increase learning motivation in elementary school. *Anatolian Journal of Education, 4*(2), 53-60.

Semsar, K. and Casagrand, J. (2017). Bloom's dichotomous key: a new tool for evaluating the cognitive difficulty of assessments. *Adv Physiol Educ, 41*, 170–177.

Sugiyono. (2018). *Metode Penelitian Pendidikan.* Bandung: Alfabeta.

Torkar, G. (2021). Effectiveness of digital and paper-based identification keys for plants with Slovenian pre-service teachers. *European Journal of Educational Research, 10*(2), 619-627. https://doi.org/10.12973/eu-jer.10.2.619

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The development of the identification key circle media for the skills of classifying animals and students' understanding of concepts
Watson, S., & Miller. (2009). Clasification and the dichotomus key tools for teaching identification (report). *Article The Science Teacher* , 50-54.