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KARAMBI: LEARNING MEDIA EXCRETION SYSTEM FOR HIGH SCHOOL CLASS XI

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Abstract: Karambi learning media is a board game played by several people and there is an element of teamwork. Karambi learning media has several advantages such as training focus, fostering curiosity, increasing interest and motivation and increasing student activity in learning. This research is included in *Research and Development* to develop a valid, practical and effective Karambi learning media. This study adapts the development model of Tjeerd Plomp (1997) which consists of several stages, namely preliminary research, design phase, realization/construction phase, test phase, evaluation and revision, as well as the implementation phase. However, at the implementation stage it was only carried out on a limited scale, namely in class XI MIPA SMAN 5 Soppeng. The target of this research is the students of class XI MIPA 1 SMAN 5 Soppeng, totaling 28 students. The research instrument used is a questionnaire and items. Questionnaires are used to measure practicality, while items are used to measure the effectiveness of Karambi's media. The results of the study indicate that the Karambi learning media developed on the excretory system material has a validity value of 3.78 with a very valid category, the level of practicality based on the results of the questionnaire shows a practical category with a total value of 3.48. While the level of effectiveness of the media based on the test of student learning outcomes is categorized as effective because it reaches 100% completeness value. The implications of this research are 1) Karambi learning media on the excretory system material can be used as a media to support learning; 2) Karambi learning media is feasible to be applied as a learning medium to increase student activity; and 3) Karambi learning media can be implemented in other schools with various biological materials.

Keywords: Karambi, learning media, research and development, Tjeerd Plomp

Abstract: Media pembelajaran Karambi merupakan permainan papan yang dimainkan oleh beberapa orang dan terdapat unsur kerja sama tim. Media pembelajaran Karambi memiliki beberapa kelebihan seperti melatih fokus, menumbuhkan rasa ingin tahu, meningkatkan minat dan motivasi serta meningkatkan keaktifan peserta didik dalam belajar. Penelitian ini termasuk dalam *Research and Development* untuk mengembangkan media pembelajaran Karambi yang valid, praktis dan efektif. Penelitian ini mengadaptasi model pengembangan Tjeerd Plomp (1997) yang terdiri atas beberapa tahapan yaitu penelitian awal (*Preliminary Investigation*), fase desain (*Design*), fase realisasi/kontruksi *(Realization/construction)*, fase tes, evaluasi dan revisi (*Test, Evaluation and Revition)*, serta tahap implementasi *(Implementation)*. Subjek uji coba penelitian ini adalah peserta didik kelas XI MIPA 1 SMAN 5 Soppeng yang berjumlah 28 siswa. Adapun instrument penelitian yang digunakan adalah angket dan butir soal. Angket digunakan untuk mengukur kepraktisan, sedangkan butir soal untuk mengukur keefektifan media Karambi. Hasil dari penelitian menunjukkan bahwa media pembelajaran Karambi yang dikembangkan pada materi sistem ekskresi memiliki nilai validitas 3,78 dengan kategori sangat valid, tingkat kepraktisan berdasarkan hasil angket menunjukkan kategori praktis dengan nilai total 3,48. Sedangkan tingkat keefektifan media berdasarkan tes hasil belajar peserta didik dikategorikan efektif karena mencapai 100% nilai ketuntasan. Media pembelajaran Karambi layak digunakan pada materi sistem ekskresi kelas XI SMA karena telah memenuhi kriteria valid, praktis, dan efektif. Implikasi dari penelitian ini adalah 1) media pembelajaran Karambi pada materi sistem ekskresi dapat digunakan sebagai media penunjang pembelajaran; 2) Media pembelajaran Karambi layak diterapkan sebagai media pembelajaran untuk meningkatkan aktivitas siswa; dan 3) Media pembelajaran karambi dapat diterapkan di sekolah lain dengan berbagai materi biologi.

Kata Kunci: Karambi, media pembelajaran, *research and development*, Tjeerd Plomp

Introduction

Human can realize his existence as a caliph on this earth through the process of education or the process of studying. Education is urgently needed to lead to a better civilization of society (Anwar, 2017). Society is required to be able to carry out various roles in the field of life, both in the present and in the future. Therefore, an education is needed that provides guidance, teaching and or practice that takes place

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in the classroom or outside the classroom (Kadir, 2012). To achieve the national education goals stated in the Law of the Republic of Indonesia Number 20 of 2003, it is necessary to improve the quality of education in Indonesia which is stated to be still low compared to the quality of education in other countries (Anjarwati, 2020). One of the efforts to improve the quality of education is to improve the quality of learning in schools. Improving the quality of learning is related to the preparation of a curriculum that is in accordance with the development of the times, adequate infrastructure, and innovations made by educators to support the learning process (Triyanti, 2018). Learning is a process to organize, direct, and guide students in facing changes in the environment around students. Learning is said to be successful if in the process the behavior of students undergoes changes or improvements towards a better direction (Pane, 2017) both in terms of affective, cognitive, and psychomotor.

Learning in Islam is defined as a full-fledged effort of awareness and planning to form the akhlakul karimah of students through optimizing the potential of hearing, sight, and heart (Azkiyani, 2020). The optimization of these three potentials can lead people to knowledge and become people who are always grateful, as Allah said subhanahu wa ta'ala in Q.S An-Nahl/16: 78.

وَاللّٰهُ اَخْرَجَكُمْ مِّنْۢ بُطُوْنِ اُمَّهٰتِكُمْ لَا تَعْلَمُوْنَ شَيْـًٔاۙ وَّجَعَلَ لَكُمُ السَّمْعَ وَالْاَبْصَارَ وَالْاَفْـِٕدَةَۙ لَعَلَّكُمْ تَشْكُرُوْنَ ۝٧٨

Meaning:

"And Allah has extracted you from the wombs of your mothers not knowing a thing, and He made for you hearing and vision and intellect that perhaps you would be grateful."

Tafsir ibn katsir Surah An-Nahl verse 78 explains that Allah Almighty bestowed grace on his servant after being removed from his mother's belly in a state of ignorance. After that He gives hearing to know sound, vision to see all things, and the intellect whose center is the heart. God bestows upon the intellect by which he can distinguish good and bad. The grace or senses obtained by man gradually, every time it grows, increases his hearing, sight and reason (Abdullah, 2005). It is intended that man may worship His Most High Rabb.

Ideal learning, one of which can be created with the help of learning media. Learning media is a tool used by educators to deliver material to make it easier and more structured, as well as help students understand learning concepts (Eni et al., 2020). The selection of media that is interesting and in accordance with the characteristics of students can encourage the achievement of the desired learning objectives (Nurrita, 2018). However, in the field, the use of media by educators in the learning process is still minimal. The difficulty of obtaining suitable media for use in learning, educators do not have time to create and prepare learning media and the costs that making learning media are factors or reasons educators ignore the use of media in learning (Audie, 2019). Meanwhile, media is one of the important components to support the learning process.

Based on the results of observations and interviews with one of the Biology teachers and students at SMAN 5 Soppeng, namely Mignia S.Pd., M.Pd, it was found that the use of learning media was still minimal and less varied. Educators tend to provide learning materials to students with lecture methods, assignments in print, the use of power point media, and the application of cooperative learning models with small discussions. This causes the learning motivation of students to be low and classified as passive in participating in learning. In addition, the use of learning media in the excretion system material is still lacking, this material is only delivered through the lecture method with the help of power point media. In addition, student learning outcomes related to biology material still have a lot of cognitive scores below KKM, namely the value of 75 which has been set by the school. Based on the results of observations, 70% of students still find it difficult to answer biology questions and 71% of students agree that learning is presented pleasantly through the game system.

In order to overcome the problem of students who are passive in participating in learning due to lack of strategy and media selection, it is necessary to innovate in learning media. Learning media in the form of games is one of the components that can increase the activeness and motivation of students in learning. Activities that provide a sense of joy, joy, increase the experience and knowledge of students through exploration and interaction activities are the essence of the game (Subhan, 2016).

Karambi learning media is a type of board game that is played in groups and there are rules that must be met together. This Karambi game contains elements of competition and teamwork that will lead students to help each other and guide each other (Subhan, 2016). Karambi game has several advantages, namely; train learners' hand dexterity to aim at targets into holes, train learners' intelligence with in-game tactics and train learners' focus. The use of Karambi learning media is able to foster curiosity, increase interest and motivation to learn and increase student activity because they feel challenged to complete the game and become winners (Maryanti & Lativa, 2019).

Materials and Methods

This research was carried out in April 2022 and is included in the type of Research and Development (R&D) research based on the development model of Tjeerd Plomp (1997). This development model consists of several stages, namely: the initial investigation (*Prelimenary Investigation*), the design phase, the realization/ construction phase, the test phase, evaluation and revision and the implementation phase. The research subjects were students of class XI MIPA I SMAN 5 Soppeng with a total of 28 students.

Data collection techniques are in the form of validation sheets to measure the level of validity of the media developed, learning outcomes tests consisting of 35 numbers with multiple choice questions to test the level of media effectiveness, and questionnaires of teacher and student responses to determine the level of practicality.

Result and Discussion

A. Karambi Learning Media Development Stage (Biology Karambol)

The stages of development of Karambi learning media are based on the development model of Tjeerd Plomp (1997) which consists of several stages, namely: (1) the initial investigation phase; (2) the design phase; (3) realization/ construction; (4) the test phase, evaluation and revision; and (5) implementation.

1. Initial Investigation Phase

This activity aims to identify problems that are often faced by educators and learners in the learning process. The fundamental problem found at the research site, namely at SMAN 5 Soppeng, the subject of biology is the lack of variation in the use of media in learning, only using power point media with the lecture method and occasionally using a cooperative model. This causes students to be passive and lack motivation in participating in biology learning. Although in learning educators have tried to apply learning that activates or increases the motivation and enthusiasm of students, it is still in a simple form.

The academic ability of students of class XI MIPA 1 SMAN 5 Soppeng for the 2021-2022 school year is heterogeneous, namely students with high, medium and low abilities. Judging from the background of knowledge, students have already obtained lessons about the material of the excretory system in class VIII of junior high school and in everyday life students experience in themselves related to the phenomenon of the excretion system. Based on the results of observations, most students like fun learning and still find it difficult to understand material that is only assisted by power point media. This has an impact on the daily test scores of students who get a lot of scores below Minimum Completeness Criteria (MCC) because they still have difficulty in relating the material received with the questions provided assisted by simple media and lecture methods. In addition, based on the questionnaire provided, most students choose the excretion system in class XI as a material that is quite difficult to understand becauseof the wide scope of the material.

The curriculum that applies in class XI of SMAN 5 Soppeng is the 2013 curriculum with a MCC score standard of 75 for biology subjects. The syllabus of Biology subjects consists of core competencies, basic competencies, indicators, subject matter and learning activities. This excretory system material is material taught in even semesters with a time allocation of 4 hours of lessons/week. The learning objectives on the excretion system material are: (1) analyzing the structure and function of the organs of the excretory system in humans and animals; (2) analyzing the excretion process in humans and animals; (3) analyzing abnormalities and diseases related to the excretory system; and (4) analyzing technologies related to the health of the excretion system. Based on the problems found, researchers tried to provide

solutions with the use of learning media that were fun and able to increase student motivation, namely Karambi learning media on the excretion system material.

2. Design Phase

The design phase is an advanced stage of the previous phase, where the results of the initial investigation are used as a reference to develop media that is in accordance with the problems found. The first thing that is done is the preparation of tests that refer to the analysis of the material and the analysis of tasks. The preparation of tests in this study serves as a parameter to measure the cognitive tests of learners after the application of the media. Making a test grid is an activity that is carried out before designing a learning outcome test on the excretory system material. In this study, a learning outcomes test of 35 questions was made to test the level of understanding of students towards the learning objectives of the excretory system.

The second stage is media selection, media selection is adjusted based on the problems found in the initial investigation stage. After analyzing the problem, analyzing the characteristics of students and analyzing the material, the media that will be used as a solution to the problem found is determined. The learning media chosen in the study is an interesting Karambi learning media with several advantages. Media is designed to provide convenience to students in understanding the material of the excretion system with the game system, so that it is indirectly able to increase the activeness and motivation and learning outcomes of students. Next is the selection of a learning media format that suits the needs and characteristics of students. Karambi learning media is a visual learning media in the form of games. The learning media developed contains elements such as illustrations, colors and text so as to attract the attention of students. In addition the media developed in the game system will make learning fun.

The next step is to design the initial product of Karambi media for students of class XI MIPA SMAN 5 Soppeng discussing the excretion system. The activities carried out are determining the size of the Karambi board, which is 60 cm x 60 cm, the Karambi board design, the question card design, and the Karambi ball design, all of which are designed in the Canva application. Picture of the initial design of karambi learning media shown in Figures 1, 2, and 3.

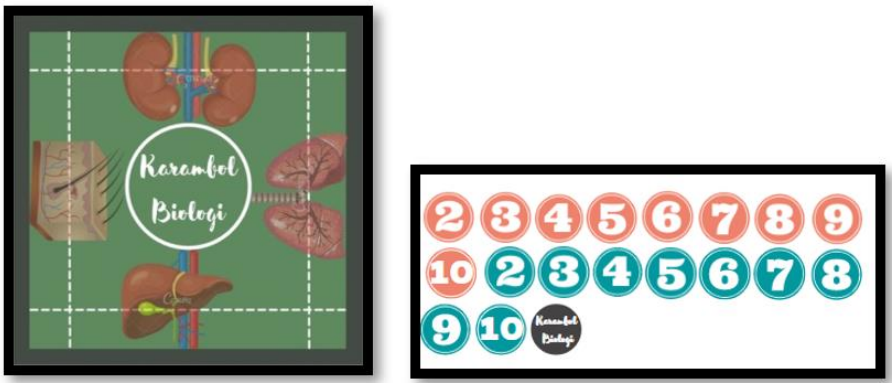

Figure 1. Karambi's board and ball design

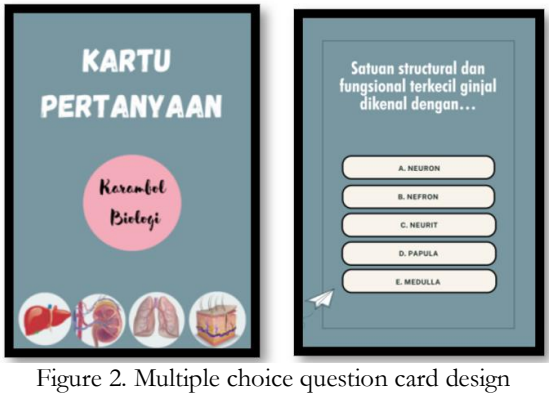

Figure 2. Multiple choice question card design

Figure 3. The question card design is correct or false

3. Realization Phase/ Construction

This stage is an advanced stage of the design or design phase. The basic form of the product created as a realization of the design will then be given to validators for validation. The realization of Karambi media begins with the manufacture of boards by cutting boards measuring 60 cm x 60 cm, then around them are given wooden blocks to form a square. Furthermore, Karambi's board is hollowed out at each end as a place to insert karambi's children's ball. To give it an attractive look, the Karambi board is coated with thick and slippery Buffalo paper with an image of the excretion system material and biological cartilage previously designed in the Canva application and then printed and pasted on the board. Furthermore, karambi ball seeds are made using acrylic material measuring 3.5 cm in diameter and 0.5 cm thick by 18 pieces and 1 aiming ball that reads biological carbine. For the manufacture of question cards designed in the Canva application, they are then printed using 7 cm x 9 cm kingstruk paper as many as 65 pieces. The questions on the card have been adapted to the learning objectives of the excretory system material and are presented in 2 forms of questions, namely multiple choice and right and wrong.

The following are the results of the realization of Karambi learning media:

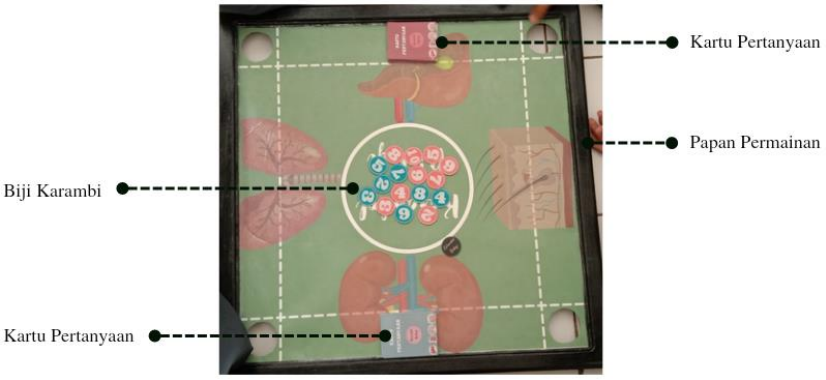

Figure 4. The results of the realization of Karambi learning media

4. Test Phase, Evaluation and Revision

At this stage, activities are carried out in the form of instrument and media validation by material experts and media experts. Validation activities are carried out by 2 lecturers by providing input and suggestions for further revision so as to produce valid products. The instruments validated in this study are rpp validation, media, learning outcomes tests, teacher response questionnaires, and student response questionnaires. The media validation developed aims to determine the feasibility of the media before it is applied in class.

Validator suggestions and input related to the developed learning media contain suggestions on the right-false question card to be given a break between the sentence "True or False" and the question. Based on the suggestions of the two validators, improvements or revisions have been made to obtain valid research instruments and media. The revised results are then referred to as prototype II and are ready to be tested after they are declared valid.

5. Implementation Phase

At this stage, Karambi learning media that has been declared valid, practical and effective is implemented only on a limited scale, namely in class XI MIPA SMAN 5 Soppeng.

B. Level of Validity of Karambi Learning Media (Biology Carbine)

The Karambi learning media developed is categorized as very valid in terms of several aspects such as the appearance of attractive media, media content in accordance with learning objectives, ease of use of the media and the language used (Table 1).

Table 1. Karambi media validity analysis results

Assessment Aspects	Assessment Results	Category
Display	3.75	Very Valid
Contents of Karambi Media	3.75	Very Valid
Technical Quality	3.5	Very Valid
Size	4	Very Valid
Communicative language	3.75	Very Valid
Suitability of use of terms	4	Very Valid
Average	**3.78**	**Very Valid**

Based on the validation results obtained, the Karambi learning media developed meets the very valid category with an average value of 3.78 things in accordance with suryo Hartanto's theory (2020) that if the average value of validity is in the range of X > 3.4 then dapat is said to be very valid.

The learning media developed is classified as very valid. This is in accordance Fajrianti et al (2018) if the average score of the assessment reaches a good category, the product developed is considered valid and suitable for use. Learning media is considered valid if it is developed in accordance with the curriculum, able to motivate students, developed according to the characteristics of students, and student-centered learning media educated. This is also in accordance with the research of Listiani and Erliana (2018) with the results of the learning media research developed to be in the very valid category due to the assessment of the material aspect and the aspect of the learning media. The learning media developed is in accordance with the applicable material and curriculum.

C. Practicality of Karambi Learning Media (Karambol Biology)

The level of practicality of the media is known at the trial stage by providing questionnaires/ questionnaires for the responses of educators and students after being applied to the learning process in the classroom.

Table 2. Results of the analysis of educators and students responses to the media

No.	Types of Research	Average
1	Educator Response	3.50
2	Learner Responses	3.47
Total Average		3,48
Assessment Criteria		**Positive**

Based on the results of the analysis of practicality test data, a score of 3.47 was obtained for the results of the student questionnaire and 3.50 for the results of the educator response questionnaire. If all questionnaire assessments are averaged, the assessment results are obtained, namely 3.48 which are expressed in the practical category (Table 2). So that Karambi's learning media on the excretion system material can be implemented in the learning process.

The practicality of Karambi media can be seen from the ease of using the media, this can be seen from the educator response sheets and student response sheets as a result of the level of media practicality. The practicality of product development refers to the user liking and can be used easily under normal conditions (Haviz, 2013). This is in line with Desy's research (2017) that media that is well packaged and interesting according to existing material will create a pleasant learning atmosphere for

students. Media in the form of games provides a platform for students to improve their problem-solving ability, critical thinking ability, ability to find solutions and the ability to expand the knowledge they have, as well as increase the enthusiasm for learning of students (Sharon, 2014). In addition, research from Subhan (2016) states that biological materials in the game will be easier to understand because students share information with each other to win the game.

D. Effectiveness of Karambi Learning Media (Biology Karambol)

The level of effectiveness is measured by researchers by giving question items to students to find out the level of effectiveness of Karambi media. Data on the level of effectiveness of the media can be measured from the level of mastery of students over the material that has been taught.

Table 3. Percentage of Learner Learning Outcomes

No.	Score	Category	Frequency	Percentage (%)
1	0 – 74	Incomplete	0	0%
2	75 – 100	Complete	28	100%
		Sum		**100**

Based on the data in Table 3, it can be concluded that 28 students scored above MCC with a percentage of 100% or the complete category is already above the minimum number of completion of learning outcomes, which is 80%. Based on the data, Karambi learning media meets the criteria of being very effective as a learning medium. This is because the development of Karambi learning media is presented using questions that are in accordance with the learning objectives and presented interestingly through the game system so as to improve student learning outcomes on the excretion system material.

In line with the research of Sara De Freitas and Martin (2006) that games in the learning process in the classroom, both formal and informal classes can support to accelerate the occurrence of the learning process, helping to improve high-level cognitive development and increase motivation in learning. Learning with a game system has a good impact on increasing motivation (Hakim & Harlinda, 2017), interest in learning (Aini, 2018), learning effectiveness (Ardiansyah & Sasminta, 2014) and learning outcomes (Ratmaningsih, 2018). The integration of games in learning will have an impact on increasing the interest and motivation of learning students so as to trigger curiosity then continue to explore activities, further explore the learning activities they do, train cooperation, and share opinions with each other in discussion activities so as to improve student learning outcomes (Redy & I Made, 2020).

Conclusion

Karambi learning media is suitable for use in the material of the excretion system for class XI SMA because it has met the criteria of valid, practical, and effective

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