

## Board Game as An Evaluation Instrument for Classification of Living Things Material

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**Abstract:**

The aim of the research was to develop a board game on the classification of living things that were suitable for use by class VII students at MTs Muhammadiyah 1 Malang. This research used the ADDIE method, which consists of 5 stages: analysis design, development, implementation, and evaluation. The time and place of this research were carried out in class VII at MTs Muhammadiyah 1 Malang. This research was conducted from August to September 2023. Validation by media experts to assess the board game being developed, namely in terms of image, colour and writing aspects. Results of a large-scale student response questionnaire from 24 VII grade students. Experts rated the results of the research; the evaluation instrument obtained used an average of 66% (valid), the assessors from media experts obtained a score of 76% (valid), and science teachers obtained a score of 87,5% (valid), and student responses showed a positive valued with a score of 86%, in general students stated that the board game media was valid and easy to used. Furthermore, it could have been further developed towards the complexity aspect of the game on other science and biology topics that were more diverse and had their characteristics.

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## Introduction

Education aims to prepare students through various activities, including teaching, guidance, and training, to strengthen their competencies for the future. The 21st Century Education is expected to provide skills in several aspects, including problem-solving and critical reasoning (Rahayu, R., 2019; Sudamin et al., 2022; Zubaidah, 2020). Fun learning is also the focus of several studies; for example, the Balogo game can strengthen students' character (Istati, 2017) and several traditional games that are combined with several science materials neatly and attract students' attention (Haya et al., 2014; Rohman & Mutmainah, 2015; Indra & Fitria, 2021). By using game media, bored students will be more relaxed in learning. It is interesting to do because it is adjusted to the psychological development period of students, for example, elementary school and middle school/junior high school (Su et al., 2014; Haya et al., 2014; Funa et al., 2021; Alotaibi, 2024). This study aims to develop board game-based media that can be used as an evaluation instrument.

Board game media is a fun learning media (Rohman & Mutmainah, 2015; Prameswara et al., 2016) This board game is adapted to the conditions and circumstances of students who still like to play daily. According to research conducted (Siswanto & Putra, 2013; Istikomayanti et al., 2022) stated that the characteristics of elementary school children to junior high school still like to play while learning. Playing while learning will produce more interesting learning activities and help the learning atmosphere become more enjoyable.

Board game media is also fun for students, creating a more fun and meaningful learning atmosphere—board game media (Susanto et al., 2012). According to (Siskawati, 2016) the use of board game media could cause students to feel interested, attentive, participate and have a sense of desire to follow the learning process, which could arouse students' interest in learning better and students more motivated in following the learned process. In addition, by using board game media, students can learn directly and experience the learning process themselves to more easily understand the concepts of the material. If the learning process is carried out by themselves, it becomes more meaningful, and a student-centred learning process occurs.

Other studies that reviewed meta-analysis concluded that games would provide uniqueness in learning, such as chemistry learning. Games in learning also open up opportunities for broader aspects, including students' knowledge, motivation, and emotional skills. Game-based learning achieves knowledge and reinforces other valuable aspects, including optimizing students' thinking processes during the game and other character values (Su et al., 2014).

Some things that need to be considered when compiling card game-based learning are the rules, the number of cards, and the game's length. Card games also provide the highest value in recalling biological concepts; for example, in this card game, the classification and diversity of living things are discussed (Su et al., 2014). Some considerations in choosing the game's difficulty are choosing a range of medium to high difficulty levels where students will enjoy relatively easy questions and then be challenged to answer pretty complex questions. The rules and sanctions given also look funny compared to formal learning, which lacks the "funny" aspect that is close to student psychology. Such as appointing a friend to ask questions and being given

limited time, students will be challenged by the game motif that has been prepared (Su et al., 2014; Triyanto et al., 2017; Okra, 2023).

In addition to being a medium, board games are also evaluation instruments. Questions are one form of authentic assessment, and the diversity of student answers is. During the game, students will actively think and focus on the questions. In board games, several levels of challenges encourage students to develop strategies and collaborate. So, it will be easier to do assessments through board game media.

Several researchers have also developed strategies in learning the material of classification of living things that are full of introduction to the scientific names of living things. For example, using interactive electronic media motivates students to learn plant classification (Fajriatun & Roviati, 2022; Marshall et al., 2024). Seeing this opportunity, MTs Muhammadiyah has also provided learning with various games, but board-based games or board games have never been developed. The board game media type was chosen because it is easier to make, can include many images, and is easier to play.

The board game media used in this study is engaging and fun, so it can make students more enthusiastic and participate in the learning process. Board games can be used as a science learning medium, with various components in the game that can be modified according to learning needs. Board games can also be an appropriate and fun learning evaluation instrument to increase students' interest in learning (Agustin et al., 2018; Sudarmin et al., 2022).

Some advantages of using non-test type evaluation instruments, for example, with games, are that they can increase student motivation. Non-test evaluation instruments are expected to be able to assess student learning outcomes authentically, for example, in the material on the classification of living things applied in this study. Authentic assessment is expected as a means of self-education that aims to teach students to metacognition the extent of their understanding and insight (Aisyah et al., 2019; Astuti & Kristin, 2017; Pritasari & Jumadi, 2018).

## Research Method

This development research method uses the ADDIE learning model development. This developed model is in stages (Analysis, Design, Development, Implementation, Evaluation). Each stage in this development model describes clear and precise steps to produce learning media. This study uses a data collection instrument in the form of a questionnaire sheet, which includes a questionnaire that is presented in a simple form so that responses can provide content according to their wishes and circumstances. An open questionnaire consists of a questionnaire of material experts and media experts that are analyzed qualitatively to provide an overview and suggestions that have been given so that product deficiencies are related to the quality of media, concepts and materials.

## Results and Discussion

This research is in the form of a board game, which uses a development model developed by Branch (2009) using the ADDIE approach. This research uses the stages of analysis, design, development, and evaluation without a large-scale implementation stage not being carried out due to limited time research.

Pictures 1, 2 and 3 display a board game developed by adding question cards, cha, lovely cards, dice and pawns. One set of this game is also equipped with a game guide, scoring for players, and answer keys. The rules of the game are 1) the game can be played by a minimum of 2 people and a maximum of 4 students, 2) one student acts as a judge who reads the questions to the players, 3) if the player has thrown the dice and stepped on the box can answer the question correctly then he is allowed to continue the game, 4) players who cannot answer remain in the initial step box, and take turns playing with the opposing player if they cannot answer board game device that includes the material of classification of living things with learning indicators including identifying the characteristics of living things and identifying class characteristics to species in several kingdoms. Material experts carry out the validation stage. It is used to assess the products that have been developed, namely the value of the aspects of content validity and language validity.



Figure 1. Board Game Media



Figure 2. Question Card

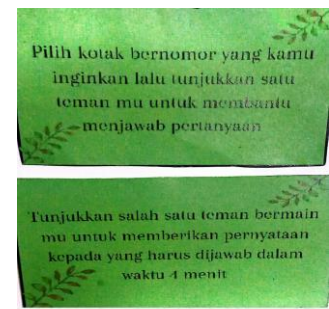


Figure 3. Chance Card

Table 1 presents the validation results by material experts, and Table 2 presents Media expert validation results to assess Board games in the aspects assessed, namely graphic validity and language appropriateness. Science teachers conduct validation to determine the validity of the board game, which assesses the curriculum, material, and language aspects. The results of teacher validation can be seen in Table 3 regarding the results of teacher expert validation. The large-scale test student response questionnaire was conducted on 24 grade VII students at MTs Muhammadiyah 1 Malang on October 2, 2023. The student response questionnaire was filled out to determine the attractiveness of the science learning board game that was developed. Analysis of the results of the large-scale test student response questionnaire can be seen in Table 4 and the results of the large-scale test student responses. The small-scale test student response questionnaire was conducted on 10 grade VIII students at MTs Muhammadiyah 1 Malang on October 2, 2023. The student response questionnaire was filled out to determine the practicality of the science learning board game that was developed. Analysis of the results of the small-scale test student response questionnaire can be seen in Table 5.

**Table 1. Material Validation Results**

Assessment Aspect	Score	Percentage
Validity of Content	40	80%
Language validity	40	80%
<b>Total Score</b>	<b>80</b>	<b>80%</b>

**Table 2. Media Expert Validation Results**

Assessment Aspect	Score	Percentage
Validity of questionnaire	39	78%
Language validity	38	76%
<b>Total Score</b>	<b>77</b>	<b>77%</b>

**Table 3. Material Validation Results**

Assessment Aspect	Score	Percentage
Curriculum aspect	28	93%
Material aspect	35	87,5
Language aspect	28	93%
<b>Total Score</b>	<b>91</b>	<b>91%</b>

**Table 4. Results of Data Analysis of Grade VII Student Responses**

Assessment Aspect	Score	Percentage
Attraction of Board Game	810	84,3%
Material aspect	411	85,6%
Language aspect	328	91,1%
<b>Total Score</b>	<b>86,6</b>	<b>86,6%</b>

**Table 5. Results of Data Analysis of Grade VIII Student Responses**

Assessment Aspect	Score	Percentage
Attraction of Board Game	360	83,3%
Material aspect	188	62,6%
Language aspect	170	56,6%
<b>Total Score</b>	<b>67,5</b>	<b>67,5% %</b>

Board game media to grade VII students at MTs Muhammadiyah 1 Malang have provided motivation, which was shown in the aspect of interest of 38%, but in the aspect of material and language, it reached 50-60% or the moderate category. This is input for further improvements, namely perfecting the writing of question sentences and evaluating the variation and depth of the material.

The shortcomings of this development product require improvements in the material and language aspects. The use of question sentences tends to be formal and has yet to adopt the special uniqueness required. For example, a game that was developed on the immune system uses illustrations in the form of comic characters that are not commonly used in formal media. This can be a further consideration. So, it is hoped that the language and material are arranged in the context of understanding and "funny" that students understand. "Funniness" in developing games on the immune system, where the reasonably abstract phagocytosis process is depicted with



a more relaxed representation, such as comic characters quite close to student psychology.

The development of card games as an evaluation instrument has also been carried out in several studies; for example, open-ended questions are given, and students are allowed to write answers on cards. Card games were chosen as a prospective alternative as an evaluation instrument that was previously limited to test-based/paper and pencil-based evaluations. This challenges teachers to organize systematic questions, and the complexity of the questions can be in the form of a sequence of instructions or answers that may increase along with the level of game achievement (Alotaibi, 2024; Reilly & Gillic, 2023).

Board game media has advantages: It is easy to use, does not require much cost to produce, attracts attention with images, facilitates understanding of various living things, and is not easily damaged. The material used is art paper, which is strong enough and can be printed individually. The limitation of this study is that it has yet to be implemented on a broader scale in other classes. As a further suggestion, it is hoped that it can be applied more widely and with more enjoyable game variations.

Some similar board games, such as the basic game (Haya et al., 2014; Susanto, et al. 2012) containing boards and cards in Physics lessons have also succeeded in attracting students' attention. For example, emphasizing more on examples of everyday life presented in the game. This is what has not become an alternative for selecting material on this board game media. The material in the media is still limited to the material in school books and has not been maximized contextually and really touches students' lives. So it is hoped that further research can connect the context of students with the material.

Game-based media is not only in the form of non-test media but in terms of material, variations are also needed in compiling questions and learning (Siskawati, 2016; Susanto et al., 2012) containing boards and cards in Physics lessons, have also succeeded in attracting students' attention. For example, it emphasizes more everyday life examples presented in the game. This has yet to become an alternative for selecting material on this board game media. The material in the media is still limited to the material in school books and has yet to be maximized contextually and touches students' lives. It is hoped that further research can connect the context of students' learning the material.

Thus, the results of this study have provided an alternative solution to the assessment of student learning evaluation at MTs Muhammadiyah, which is more varied and attracts students' attention with the achievement of medium category scores. Furthermore, it is expected to increase the variety of media in the context of the game to bring students closer to science and other subject matter with the uniqueness and distinctiveness of the material. The implications of this study are expected to be a challenge to be creative in developing media and facilities for learning and assessment that are not only conventionally based on paper and pencil. Various types of interactive media are more complex and will increasingly encourage students to complete challenge after challenge.

## Conclusion

Based on the results of data analysis obtained by the results of the media expert validator on the science learning board game on the Classification of Living Things Material for Class VII MTs Muhammadiyah 1 Malang, the results of the material expert validator obtained a percentage of 66% with a valid score, the results of the media expert validator obtained a percentage of 76% with a valid score, and the results of the teacher validator obtained a percentage of 87.5% with very valid criteria. Finally, the results of the large-scale trial response obtained a percentage of 86% with very valid criteria.

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