VALIDATION OF ECOBOARDGAME LEARNING MEDIA TO IMPROVE THE PEDAGOGICAL COMPETENCE OF BIOLOGY MGMP TEACHERS

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Abstract: *This community service activity aims to improve the ability of MGMP Biology teachers in Pulang Pisau Regency in developing innovative project-based learning media through the validation of the Eco Board Game. This media is designed as an interactive and contextual Biology learning aid, in accordance with the spirit of the Independent Curriculum. This study uses a quantitative descriptive approach involving two validators, namely material experts and media experts, who assess the feasibility of content, presentation, appearance, and ease of use. The validation results show that the material aspect obtained a feasibility percentage of 77.50% with the category of "Good", while the media aspect obtained a percentage of 80.00% with the category of "Good". These findings indicate that the Eco Board Game has met the feasibility criteria as an effective, interesting, and applicable learning media. In conclusion, the Eco Board Game is suitable for use in Biology learning activities and has the potential to increase teacher creativity in designing environment-based learning.*

Keywords: *Ecoboardgame, Validation, Learning Media, Biology, Innovative*

Introduction

21st-century education requires teachers to be able to develop critical, creative, collaborative, and communicative thinking skills through meaningful learning (Anugerahwati, 2019; Chen, 2023; Karaca-Atik et al., 2023; Mutohhari et al., 2021; Pratiwi et al., 2019) . In this context, teachers not only act as conveyors of information, but also as facilitators who are able to create an active, innovative, and enjoyable learning environment (Andini et al., 2024; Basyori, 2025; Chen, 2023; Nursakinah et al., 2025) . However, based on the results of initial observations at the Biology Subject Teachers' Conference (MGMP) in Pulang Pisau Regency, many teachers still face challenges in developing interesting learning media that are appropriate to student characteristics. This has an impact on student learning engagement which tends to be low and the dominance of lecture methods in Biology learning activities.

Efforts to improve teachers' pedagogical competence are crucial to addressing these challenges. Pedagogical competence encompasses teachers' abilities to effectively design, implement, and evaluate learning processes. (Andini et al., 2024; Basyori, 2025; Batubara et al., 2024; Nursakinah et al., 2025; Sele et al., 2022) . One form of innovation that can support the improvement of these competencies is the development and utilization of educational game-based learning media . Game-based learning media has been proven to increase learning motivation, foster cooperation between students, and help understand abstract concepts more concretely (Atmojo et al., 2025; Maulidin et al., 2025; Ramadhani et al., 2025) .

Several previous studies have shown that the use of *board games* in learning can improve students' learning outcomes and interest in science (Aisah et al., 2024; Aziza, 2024; Febrian et al., 2025; Ilmia et al., 2022; Maulidin et al., 2025; Ramadhani et al., 2025) . However, most studies still focus on improving student learning outcomes, with few emphasizing the development of teachers' pedagogical competence through educational games.

This community service activity aimed to validate the *Eco Board Game learning media* as an innovative educational medium that can improve the pedagogical competence of MGMP Biology teachers in Pulang Pisau Regency. Through this validation, it is hoped that the developed media will be suitable in terms of content, presentation, language, and ease of use, so that it can be optimally used in Biology learning activities based on the Independent Curriculum.

Method

This community service activity uses a quantitative descriptive research type that focuses on the validation process of the *Eco Board Game learning media* as an effort to improve the pedagogical competence of MGMP Biology teachers. The community service activity was carried out for three months, namely from July to September 2025, with the implementation location at SMAN 1 Pulang Pisau, Pulang Pisau Regency, Central Kalimantan. The target audience of this activity is high school biology teachers who are members of the MGMP Biology community of Pulang Pisau Regency. This activity was carried out in collaboration with MGMP Biology Pulang Pisau Regency as the main implementing partner.

The validation subjects in this activity involved two experts, namely a material expert from the field of Biology and a learning media expert from the field of educational technology. The procedure for implementing the activity began with the submission of the *Eco Board Game product* to the experts to be assessed in terms of the feasibility of content, appearance, language, and ease of use. Each expert provided an assessment using an instrument in the form of a validation sheet with a Likert scale of 1 to 4, where a score of 1 indicates the category of "Poor", a score of 2 "Sufficient", a score of 3 "Good", and a score of 4 "Very Good". The data collected came from the results of the assessments of each validator which were then added and calculated to obtain the percentage of media feasibility.

Data collection techniques were carried out through documentation and completion of validation sheets by experts. Validation data were analyzed descriptively quantitatively using the feasibility percentage formula:

$$PS = \frac{n}{N} x\ 100\%$$

Information :
PS : Percentage score
n : number of scores obtained
N : maximum score
(Afkar & Hartono, 2017)

The assessment results data will be converted into descriptive qualitative data according to Table 1 below:

Table 1: Eligibility Criteria

Percentage	Criteria
85.01 – 100	Very good
70.01- 85.00	Good
50.01 – 70.00	Pretty good
01.00 – 50.00	Not good

Source: Akbar in (Afkar & Hartono, 2017)

Result and Discussion

The validation results for the Eco Board Game learning media were obtained from assessments by two experts: a material expert and a learning media expert. Validation was conducted to assess the media's suitability as a learning support tool for Biology MGMP Biology teachers in Pulang Pisau Regency. The validation data were then analyzed descriptively and quantitatively to determine the percentage of suitability for each aspect. The following data is presented in Table 2.

Table 1: Media Expert Validation Results

No	Statement	Score	Information
1	Suitability of media to learning objectives	4	Good (The Eco board game media has been prepared in accordance with knowledge, skills, and attitude competencies expected in Biology learning based on the Independent Curriculum.)
2	Clarity of the material presented in learning media	4	Good (The material presented in the Eco board game is integrated, systematic, and supports a complete understanding of Biology concepts.)
3	Creativity and innovation of learning media	4	Good (The media demonstrates high creativity by innovatively combining educational game concepts and environmental issues to increase student engagement.)
4	The attractiveness of the learning media display	4	Good (The appearance of the Eco board game is attractive, with an aesthetic visual design, harmonious colors, and a clear layout, thus increasing students' learning motivation)
5	Clarity of instructions for using learning media	4	Good (The instructions for use are written in clear, coherent language and are easy to follow for both teachers and students.)
6	Suitability of the language used in learning media	4	Good (The language used is communicative, in accordance with Indonesian language rules, and encourages curiosity and in-depth understanding of concepts.)
7	Ease of use of media by the teacher	4	Good (The media is easy for teachers to operate and apply in learning activities without requiring additional complicated tools.)

No	Statement	Score	Information
8	Suitability of media to learning time allocation	4	Good (Activities in the Eco board game are arranged sequentially from beginning to end and in accordance with the learning time allocation that has been determined)
	Total	**32**	
	Percentage	**80.00%**	

Table 2: Results of Material Expert Validation

No	Statement	Score	Information
1	Suitability of Material with Competencies	4	Good (The writing systematics is in accordance with the LKPD feasibility indicators and is structured sequentially starting from identity, objectives, instructions, activities, to evaluation.)
2	Clarity of the material presented in learning media	4	Good (Each activity presented has clear learning objectives and steps that are easy for students to follow.)
3	Creativity and innovation of learning media	4	Good (The presentation of the Eco board game includes illustrations and explanations that are relevant to the material, thus helping students understand the concept better.)
4	The attractiveness of the learning media display	4	Good (The use of terms and terminology in the Eco board game is appropriate and in accordance with the concept of Biology, and is supported by an attractive visual appearance and composition.)
5	Clarity of instructions for using learning media	4	Good (The material presented is integrated with Eco board game media, shown through images, activities, and questions that are relevant to the game concept.)
6	Suitability of the language used in learning media	3	Pretty good (The material has been presented well but still needs to be developed and innovated)
7	Ease of use of media by the teacher	4	Good (Easy to understand for teachers because the design is well-organized, the appearance is harmonious, and the content is clearly structured.)
8	Suitability of media to learning time allocation	4	Good (Activities in the Eco board game are arranged sequentially from beginning to end and according to the learning time allocation)
	Total	**31**	
	Percentage	**77.50%**	

The validation results by material experts showed a total score of 31 with a percentage of 77.50%, included in the "Good" category. This means that the material presented in the Eco Board Game media is relevant, accurate, and supports the achievement of Biology learning competencies. Aspects that received high scores include the suitability of the material to competencies, the depth and clarity of the material, as well as the accuracy of terms and their relationship to the game components in the Eco Board Game. The material has been systematically arranged starting from identity, objectives, activity instructions, to evaluation, making it easier for teachers to implement it in the classroom. However, in the aspect of novelty or innovation, the material still received a "Good" score (score 3), which indicates the need for further development to make the material more innovative, for example by adding contextual elements, actual cases, or integration with environmental literacy in accordance with the spirit of the Independent Curriculum.

Meanwhile, the assessment results by media experts on the Eco Board Game showed a total score of 32 with a percentage of 80.00%, which is included in the "Good" category. These results indicate that the Eco Board Game media is suitable for use as a supporting tool for Biology learning in the implementation of the Independent Curriculum. In general, this media has met the feasibility aspects in terms of learning objectives, visual appearance, clarity of instructions, language suitability, and ease of use. Media experts assessed that the Eco Board Game design is attractive and in accordance with the characteristics of students, so it can increase motivation and active involvement in Biology learning. The creativity and innovation aspects were also considered good because the media integrates educational games with environmental concepts (*eco-friendly*), in line with the spirit of project-based learning and the Pancasila student profile. The sequentially arranged instructions for use and communicative language also support ease of implementation by teachers. Thus, from the media aspect, the Eco Board Game was declared suitable for use after undergoing minor improvements according to the validator's suggestions.

Overall, the validation results from media experts and material experts indicate that the Eco Board Game has met the eligibility criteria as an innovative learning medium capable of improving the pedagogical competence of Biology teachers. This media is considered effective in encouraging teachers to be more creative and innovative in developing contextual learning. These results are in line with the opinion of Dewi et al. (2019) who stated that learning media functions to clarify messages, increase learning motivation, and foster more meaningful interactions between teachers and students. In addition, good learning media must meet the criteria of relevance to learning objectives, clarity of content, attractiveness of appearance, and ease of use (Baharudin & Zalhairi, 2025; Shabrina et al., 2025) . Thus, the Eco Board Game as a result of the MGMP Biology teacher training in Pulang Pisau Regency can be used and further developed as a medium that supports the implementation of the Independent Curriculum because it has met the aspects of material and media feasibility well.

Conclusion

Based on the validation results conducted by material experts and media experts, it can be concluded that the Eco Board Game learning media is suitable for use as a supporting tool for Biology learning for MGMP Biology teachers in Pulang Pisau Regency. The validation results show that the material aspect obtained a feasibility percentage of 77.50% with the "Good" category, while the media aspect obtained a percentage of 80.00% with the "Good" category. This indicates that the Eco Board Game has met the feasibility criteria in terms of content, presentation, appearance, and ease of use.

This media is considered capable of enhancing teacher creativity and engagement in developing contextual, project-based learning that is oriented toward environmental literacy, in line with the spirit of the Independent Curriculum. Thus, the Eco Board Game can be an innovative alternative to support interactive and meaningful biology learning. Future development can focus on improving the innovative aspects of the material and expanding the application of this media to other relevant learning contexts.

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