

Development of Malo Maretong Smart Board Learning Media to Enhance Numeracy Skills in Children Aged 5–6 Years

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Abstract

This research aims to develop a new learning media called "Malo Maretong" which can improve the numeracy skills of children aged 5-6 years. This research uses research and development (R&D) methods by applying the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model. There are five steps in this development, but researchers focus on the first four: analysis, design, development, and implementation. This research involves literature study, validation by experts, as well as product evaluation and revision. Data was collected through questionnaires conducted by media experts, language experts and early childhood experts. Malo Maretong was successfully developed as an effective learning medium to improve the numeracy skills of children aged 5-6 years. The assessment from media experts received an average of 3.9 with a feasibility percentage of 97% and a "very feasible" category. The assessment from linguists received an average of 3.2 with an eligibility percentage of 80% and the "decent" category. The assessment from early childhood experts received an average of 3.2 with a feasibility percentage of 80% and the "decent" category. The validation results showed a very positive assessment from experts with a high average rating and a "very feasible" category. After validation by experts, product revisions and small-scale trials were carried out. The results of the small-scale trial showed an average assessment of 3.7 with a feasibility percentage of 93% and a "very feasible" category. This research makes an important contribution to the development of learning media that suits the needs and characteristics of early childhood, and provides strong recommendations for the implementation of Malo Maretong in the learning context of children aged 5-6 years.

Keywords: Development of learning media, numeracy skills, early childhood

Introduction

Early childhood is a critical phase in education. It is essential to recognize that young children have tremendous potential to develop optimally in the future. However, this potential can only be maximized if they receive proper stimulation, guidance, support, and actions aligned with their developmental stages. Children's high curiosity is evident when they confidently explore their environment, observe, touch, and approach various places and objects, demonstrating their eagerness to understand their surroundings. Research findings emphasize that Early Childhood Education is one of the right steps to develop children's potential and interest so that they can become responsible, independent, and creative individuals in the future. Children are encouraged to explore their world in a fun and stimulating way, facilitating the holistic development of their potential and interests. One of the crucial aspects of early education for children in Indonesia

is cognitive development. This aspect significantly influences a child's growth alongside other essential abilities. Cognitive skills encompass general knowledge and science, understanding concepts such as shapes, colors, sizes, patterns, and mathematics. Cognitive development in children aims to expand their knowledge through visual, auditory, sensory, and olfactory experiences gained through their senses. By developing cognitive skills, children can think efficiently and effectively when facing situations and solving problems. This aspect forms the foundation for children's ability to think critically.

Unfortunately, reality often does not meet these expectations. When learning methods fail to effectively integrate media, students may experience boredom because their expectations for dynamic and engaging learning processes are unmet.

Observations and interviews with the principal and Group B teachers at PAUD Sentuhan Kasih Abadi GBI Tarutung revealed that children were less active during learning, struggled to understand the material explained by teachers, had very low numeracy skills, and faced difficulties in pronouncing numbers and symbols from 1 to 10 correctly. These observations align with the findings of Sholihah, Maret'atush, and Afifulloh (M.), who noted that children struggle to grasp teachers' explanations when numeric symbols are not introduced beforehand.

According to Azar Arsyad, media refers to tools or means used to convey information. In fostering cognitive development in young children, the use of learning media such as the Smart Board significantly assists both teachers and students. Such media should meet specific criteria, including educational value, appealing colors, and simplicity. Based on these observations, the researcher became interested in developing the Malo Maretong Smart Board learning media to improve numeracy skills in children aged 5–6 years, particularly in recognizing numbers. The development of this learning media is grounded in a thorough understanding of the stages of numeracy development in this age range. The Malo Maretong Smart Board learning media is expected to help build a strong foundation in recognizing and writing numbers, ultimately enhancing children's overall numeracy skills. This study aims to determine the steps involved in developing the Malo Maretong Smart Board learning media to enhance the numeracy skills of children aged 5–6 years.

Methods

The ADDIE development model is a framework consisting of five steps or phases: Analysis, Design, Development, Implementation, and Evaluation (abbreviated as ADDIE). This model was introduced by Dick and Carey in 1996 with the primary aim of designing instructional systems. In the product development process, the ADDIE model is considered a more logical and comprehensive approach. Consequently, it can be applied to various types of product development, including instructional models, learning strategies, teaching methods, instructional media, and learning materials.



ADDIE Development Research Model

In the development of the Malo Maretong learning media, five development steps are typically required to achieve the final product. However, the researcher has reduced these steps to four: Analysis, Design, Development, and Implementation. This decision was made because these four steps were deemed

sufficient to address the research problem and due to time and resource constraints during the study.

In research and development, the Likert scale is used to assess attitudes, perceptions, and opinions of individuals or groups regarding the potential and challenges of an object, product design, the product creation process, and the developed or created product. This study employs a scoring scale with the following criteria:

Table 3.6 Guide to Determining Expert Scores

Category	Score
SS (Strongly Agree)	4
S (Agree)	3
TS (Disagree)	2
STS (Strongly Disagree)	1

Table 3.7 Small Group Scoring Rules

Category	Score
SS (Strongly Agree)	4
S (Agree)	3
TS (Disagree)	2
STS (Strongly Disagree)	1

By utilizing a Likert scale table, the researcher can evaluate the feasibility of the research results in representing the quality of the product as a medium. To calculate the average percentage of respondents' answers, a calculation method adapted from Adam Malik's book Introduction to Educational Statistics is used:

$$P = \frac{f}{n} \times 100\%$$

Description:

P = Percentage score or assessment score

f= Score obtained

n = Maximum score

100= Constant value

To determine the feasibility of each aspect, the following formula is applied:

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

Description:

P= Percentage score or assessment score

$\sum x$ = Total score obtained

$\sum xi$ = Total maximum score

100= Constant value

Result and Discussion

Needs Analysis Results

The needs analysis results are derived from a process aimed at identifying and understanding the requirements of users or stakeholders in the development of a specific product, service, or system. This analysis provides a comprehensive understanding of the needs, preferences, expectations, and

challenges faced by users or stakeholders. In this context, the needs analysis successfully informed the development of a learning medium called the Malo Maretong Smart Board, designed to enhance children’s numeracy skills. Participants in this study were children aged 5–6 years who actively engaged in activities involving the Malo Maretong Smart Board.

Product Design Results

The developed product is a learning medium in the form of the Malo Maretong Smart Board, designed to improve children’s numeracy skills. This medium aims to support both teachers and students in the learning process, whether conducted inside or outside the classroom. The proposed design of the Malo Maretong Smart Board learning medium focuses on fostering children’s educational development. For this research, the Malo Maretong Smart Board was constructed using plywood.



Initial Product Design Drawing



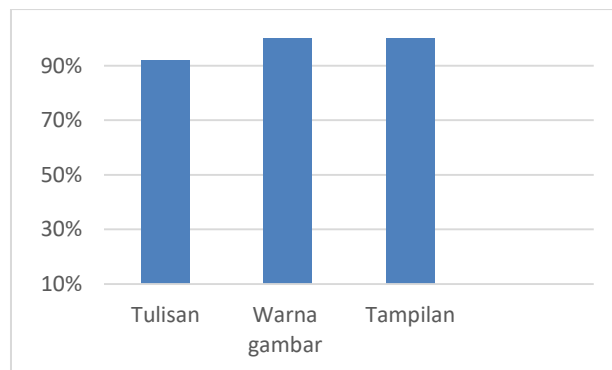
Image of Product Design Revision Results

Model Feasibility

Model feasibility refers to the evaluation or assessment of the success, effectiveness, and appropriateness of a developed model or framework. This evaluation involves an in-depth analysis of the reliability, validity, resource availability, efficiency, and suitability of the model in achieving its stated objectives. The feasibility assessment of the model is conducted by media experts, language experts, and early childhood education experts. Before the design or product is assessed, the research instruments are verified by an expert. Subsequently, validation sheets are provided to the experts, who serve as the validation team.

Media Expert Validation

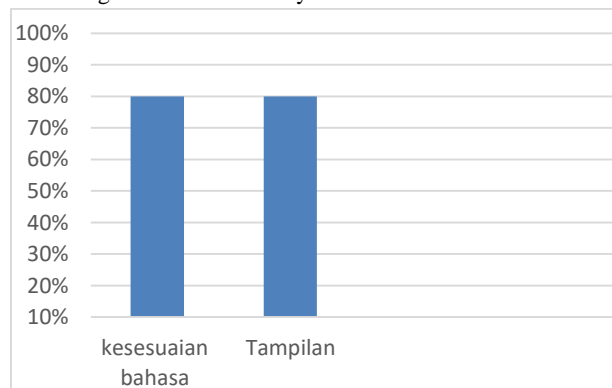
The media validation process is conducted by media experts who review the Malo Maretong Smart Board learning medium. The media experts are tasked with evaluating and providing assessments of the learning medium, particularly regarding its impact on improving children's numeracy skills.



Based on the graph above, the media expert's evaluation indicates that the writing aspect received a score of 92%, categorized as "highly feasible." The evaluation of the color aspect achieved a 100% score, also categorized as "highly feasible." Similarly, the display aspect received a score of 100%, categorized as "highly feasible." The average score provided by the media expert validators was 3.9, with a feasibility percentage of 97%, classified as "highly feasible."

Language Expert Validation

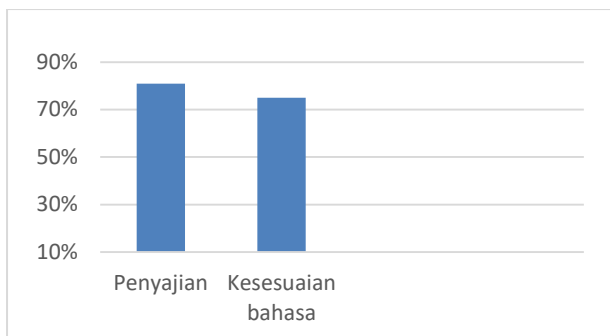
The validation stage involved language experts reviewing the Malo Maretong Smart Board learning medium. These experts were tasked with evaluating and providing assessments of the learning medium, particularly regarding its impact on enhancing children's numeracy skills.



Based on the graph above, the evaluation by language experts indicates that the aspect of language appropriateness achieved a score of 80%, categorized as "feasible." The evaluation of the display aspect also received a score of 80%, categorized as "feasible." The average score provided by the language expert validators was 3.2, classified as "feasible."

Early Childhood Education Expert Validation

The validation process by early childhood education experts involved reviewing the Malo Maretong Smart Board learning medium. These experts were tasked with evaluating and providing assessments of the learning medium, particularly regarding its impact on enhancing children’s numeracy skills.



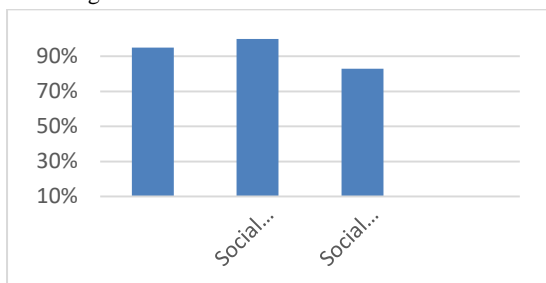
Based on the graph above, the evaluation by early childhood education experts indicates that the presentation aspect received a score of 81%, categorized as "highly feasible," while the language appropriateness aspect achieved a score of 75%, also categorized as "highly feasible." The average score from early childhood education experts was 3.1, with a feasibility percentage of 78%, categorized as "feasible."

Design Revision Results

The design revision results encompass changes or adjustments made to the product design. These revisions reflect efforts to improve or update various aspects of the product design. Following the evaluation process by a team of experts in media, language, and early childhood education, the validators provided various suggestions and feedback.

Product Testing

This small-scale trial involved nine children with diverse abilities and characteristics, including participants with low, medium, and high skill levels. Data from the questionnaires collected during the small group trial are presented in the following table:



From the diagram, it can be observed that the Social Communication aspect achieved a percentage of 95%, the Social Sensitivity aspect achieved 100%, and the Social Insight aspect achieved 83%.

In the initial stages of this research and product development, observations were conducted at PAUD Sentuhan Kasih Abadi GBI Tarutung. The findings revealed that the Malo Maretong Learning Media had not yet been used during learning activities. The first step in creating the Malo Maretong Learning Media involved identifying Potentials and Problems, as research can only proceed when underlying potentials and problems exist. Potentials refer to aspects with added value if utilized, while problems are the discrepancies between expectations and reality.

The next step was Data or Information Collection, during which the researcher conducted preliminary research based on

the identified potentials and problems. This initial study aimed to understand the needs for the required product. Once sufficient information was gathered, the researcher planned how to initiate the product development process or provide a solution (designing the learning media).

The Initial Product Development stage began at this point, where the researcher designed an early version of the product or solution. This stage involved validation by experts, including media experts, language experts, and early childhood education experts (expert validation). After the design was completed, it was revised based on expert feedback (Product Revision). The revised product then underwent a small-scale trial.

The completed Malo Maretong Learning Media product was validated by several experts, including media experts, language experts, and early childhood education experts, who were skilled in their respective fields.

The validation results from experts and the small-scale trial indicate that the Malo Maretong Learning Media is highly feasible for use and suitable for further trials, as it received high ratings from experts across different aspects.

Conclusion

The Malo Maretong Smart Board learning media, which is designed to improve children's numeracy skills, has been developed using the Dick and Carey model development research design. This media is made from plywood. Based on the assessment scores, this learning media received a score of 97% from media experts, 80% from language experts, and 80% from early childhood experts. This score shows that this media has a very high level of feasibility according to expert assessments and field trials with students. Nevertheless, the Malo Maretong Smart Board still requires follow-up steps to improve its quality and ensure its effective implementation in the learning process. With these steps, it is hoped that this media can continue to be developed and applied optimally in learning contexts, and contribute to improving the quality of education.

References

- Asyhari, Ardian, and Helda Silvia. "Pengembangan Media Pembelajaran Berupa Buletin Dalam Bentuk Buku Saku Untuk Pembelajaran IPA Terpadu." *Jurnal Ilmiah Pendidikan Fisika Al-Biruni* 5.1, 2016, 1–13.
- Damanik, Irfah Aulaini, and Nurmaniah. "Pengaruh Senam Irama Terhadap Perkembangan Motorik Kasar Anak Usia 5-6 Tahun Di RA. Fastabiqul Khairat PTPN II Kabupaten Langkat TA. 2016-2017." *Jurnal Usia Dini* 3, no. 1 (2017): 12–21.
- Hotang, Rosinda Br, Emmi Silvia Herlina, and Endang Junita Sinaga. "Pengaruh Kegiatan Kolase Terhadap Kreativitas Pada Anak Usia 5-6 Tahun Di TK GKPI Tarutung Kota Tahun Ajaran 2022/2023." *Jurnal Nakula: Pusat Ilmu Pendidikan, Bahasa Dan Ilmu Sosial* 1, no. 6 (2023): 49–64.
- Magdalena, Ina, Tini Sundari, Silvi Nurkamilah,

- Dinda Ayu Amalia, and Universitas Muhammadiyah Tangerang. "Analisis Bahan Ajar." *Jurnal Pendidikan Dan Ilmu Sosial* 2, no. 2 (2020): 311–26.
<https://ejournal.stitpn.ac.id/index.php/nusantara>.
5. Maghfi, Ulfah Nabilla, and Suyadi. "Meningkatkan Kemampuan Bahasa Anak Melalui Media Papan Pintar (Smart Board)." *SELING-Jurnal Program Studi PGRA* 6, no. 2 (2020): 157–70.
 6. Malik, Adam, and Muhammad Minan Chusni. *Pengantar Statistika Pendidikan: Teori Dan Aplikasi*, 2018.
 7. Mulyatiningsih, Dr.Endang. *Metode Penelitian Terapan Bidang Pendidikan*, 2015.
 8. Nurlidiah, Nur, Husnul Husnul Bahri, and Fatrica Fatrica Syafri. "Pengembangan Media Jari Pintar (JAPIN) Untuk Meningkatkan Kemampuan Berhitung Anak Usia 5-6 Tahun." *KINDERGARTEN: Journal of Islamic Early Childhood Education* 5, no. 1 (2022): 133.
<https://doi.org/10.24014/kjiece.v5i1.14102>.
 9. Risal,Z. Hakim,R,& Abdullah,A, R. "Metode Penelitian Dan Pengembangan Research and Development (R&D)- Konsep, Teori - Teori, Dan Desain Penelitian," 2023, 165.