

Development of Monopoly Games in Introducing Numeracy Literacy Skills to Early Childhood

Nita Adiyanti^{1*}, Imamah²

^{1/2} Universitas Panca Sakti, Bekasi, Indonesia

ABSTRACT

Awareness through literacy skills plays a crucial role in facilitating individual achievement when facing problems. Literacy skills are not only acquired from formal educational institutions, but parents also contribute to the role of early educators in providing literacy. This academic research aims to evaluate the feasibility of the learning tools that have been created, as well as the changes that occur before and after the application of these tools through the introduction of numeracy literacy for early childhood. The approach applied in this academic research domain is R&D (Research and Development), and the product development process uses the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) prototype. In this academic research, the researchers conducted a needs analysis, developed a model, carried out validation and revision, and implemented it. The targets of this academic research were children aged 4-5 years, as well as educators and school principals. The findings of the academic research showed that the researchers' work was considered suitable as a teaching tool based on evaluations by experts in subject matter, design, and media. Based on the pre-test and post-test findings, it can be concluded that this tool is effective as a teaching basis for educators to convey numeracy literacy to early childhood.

Key Word:

Early Childhood, Numeracy Literacy, Monopoly Game

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*Corresponding author.

E-mail addresses: adiyanti1226@gmail.com

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Introduction

To examine fundamental competencies is crucial in the 21st century, in line with the 2015 global economic symposium working paper entitled 'A New Vision for Education: Sharpening Social and Emotional Learning through Technology'. It consists of various elements, including science, information and communication technology (ICT), finance, culture, citizenship, and literacy and numeracy competencies, among others (Kemdikbud, 2016). In line with this, the National Literacy Movement (GLN) programme was initiated by the Ministry of Education and Culture in 2016. This was a follow-up to the issuance of Permendikbud No. 23 of 2015 concerning Character Development, which then formed the National Literacy Movement (GLN) (Wahyuni, 2022).

A number of internal and external factors contribute to the low level of literacy. Most of this group are not interested in books due to various internal problems, such as a lack of free time for reading, a preference for gadgets over books, and a lack of understanding of the significance of the tradition of literacy. External factors that hinder literacy include a lack of leadership and guidance from parents, relatively high book prices, limited book facilities, and an environment that is not conducive to the development of literacy. External factors that hinder literacy include a lack of leadership and guidance from parents, relatively high book prices, limited book facilities, and an environment that is not conducive to the development of literacy (Wijaya, 2023).

A person's ability to handle a situation well can be aided by the importance of literacy knowledge (Arsa et al., 2019). Another life skill that can maximise a person's contribution to society is literacy. A person may also have extensive knowledge and insight through reading. Parents play an important role in teaching literacy because they are the first to teach it to their children (Cahayanengdian et al., 2021). Literacy skills are not only acquired through school. The role of parents in the family must be used to foster this reading ability from an early age (Maghfirah et al., 2024).

Early childhood can foster basic literacy skills such as numeracy, science, citizenship, finance, technology, and cultural literacy (Adnyani Dewi & Suardika, 2023). Using games as a method to introduce literacy allows children the freedom to

learn through play. Literacy is contextualised within children's real-world experiences. UNESCO promotes literacy, which is defined as the capacity to read, write, and think critically to solve problems (Wahyuni, 2021). Reading, writing, and mathematics are components of literacy, and students must master these basic skills as well as numeracy, science, finance, digital literacy, culture, and citizenship (Firdaus & Azharona Susanti, 2024).

The development of reading, writing, and numeracy skills are interrelated (Hutabarat, 2020). 'Numeracy' refers to solving mathematical problems (Bali et al., 2023). To develop numeracy skills, mathematical information obtained in the school curriculum is required (Muis, 2022). If mathematical resources are not created with a specific purpose, they cannot help students acquire numeracy skills (Astutik et al., 2020). Familiarising oneself with mathematical problem-solving tasks helps improve cognitive abilities in investigating mathematical concepts, sharpening logical reasoning, and solving creative problems (Nafisah et al., 2023).

In early childhood education, the introduction of numeracy literacy must use interesting learning methods so as to attract children's interest and maximise their ability to learn (Kurniasih & Watini, 2022). With this in mind, the researchers developed a learning medium in the form of Monopoly to assist teachers in developing numeracy literacy in early childhood. The Monopoly game that we know is a form of market where there is only one seller or producer who controls the market. In addition, Monopoly is known as a game that depicts the buying and selling of companies or land. However, for the development of this Monopoly game, the researcher used the form of Monopoly to improve numeracy literacy skills that can be used freely by children so that it is safe for them (Ariani, 2016).

The teaching requirements and children who do not have access to teaching resources that can help them improve their numeracy and literacy skills at an early age serve as the foundation for this academic research. Based on this rationale, the researchers decided on the topic of Developing Monopoly Games to Improve Literacy Skills for Early Childhood (Nafisah et al., 2023).

Methods

The methodology implemented by the researchers was a mixed method, which means testing the feasibility and productivity of recreation created by utilising qualitative and quantitative information. In this academic research, the methodology used follows the R&D (Research and Development) approach, and the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) was used to create the product (Sugiyono, 2021). This academic research was conducted at RA Ilyasa Nurul Qomar, Cinangka Village, Rt.08 Rw.04, Bungursari District, Purwakarta Regency, West Java Province, involving 15 children aged 4–5 years at RA Ilyasa Nurul Qomar, as well as teachers and the principal to support the data validation process. The academic research period was conducted in October of the 2024–2025 academic year, which is the odd semester.

Data collection techniques were carried out through observation of learning activities, interviews with educators, documentation of learning activities, and initial and final tests to assess children's numeracy literacy skills. Qualitative data was analysed descriptively, while quantitative data was obtained from expert validation and children's tests, which were then analysed using descriptive statistics with a Likert scale and a comparison of pre-test and post-test scores to determine the effectiveness of the developed learning media. The researchers conducted a needs analysis and developed a model design, did validation and revision, and did trials (Sugiyono, 2022).

Results and Discussion

The needs analysis was conducted using instruments compiled in the form of questionnaires, interviews, and observation sheets. A literature study was conducted by reading the recapitulation of student assessments from all aspects of development (Amir Hamzah, 2019). From the results of this recapitulation, the researcher observed the aspect of children's numeracy literacy development. To that end, the researcher conducted interviews and observations of teachers. The researcher interviewed teachers regarding the models and methods of learning applied in the classroom. They felt that learning media was not yet fully understood in detail, so they only created learning plans for core activities, and project-based learning required a lot of media

and preparation. Researchers also observed the development process carried out by educators to develop children's numeracy skills, which was mostly done through interesting activities such as counting or saying numbers, and the activities were dominated by the use of worksheets alone. Therefore, it can be analysed that teachers need special learning media in the form of educational games, and students certainly need fun and varied activity methods according to their needs.

The academic research that was used involved several model designs developed by researchers; however, in this case, the researchers only took three stages of the model. These included setting learning objectives based on the researchers' observations, collecting learning indicators, selecting learning activities that were in line with the learning objectives, developing assessment tools, producing learning media, developing learning tools and materials, creating activity schedules, and developing developmental assessments.

Researchers conducted feasibility tests on games or learning media designed by three expert examiners. The first feasibility test was an examination of expert judgement. Sugiyono defines design validation as a series of actions to logically determine whether the design has been assessed as successful (Sugiyono, 2019). Several experts or similar specialists were invited to carry out this validation. 'Expert assessment' is the term used to describe this process. The purpose of this expert validation process is to test the validity of the interactive monopoly game in terms of its design, materials, and tools. The focus is on the material contained in the dynamic narrative work. Before being applied to students, this work is assessed by material experts, design experts, and tool experts to evaluate the validity and flexibility of the teaching work related to the Monopoly game.

Fact collection is one of the various parts of model execution that will be applied by several researchers. Primary and secondary sources of information are two types of data sources used by researchers when accumulating data. Primary data is obtained through the development of academic research tools, teacher interviews, and experiments related to the development of numeracy and literacy skills in early childhood. In addition, secondary data uses sources from books, journals, websites,

and previous academic research findings to support information that explains issues surrounding academic research.

Data analysis was then conducted. In this academic study, there were two classifications of data, namely qualitative data and quantitative data. Qualitative facts included responses, input, and recommendations provided by teachers, media experts, and learning material experts to improve the final representation. To assess the feasibility of learning media or educational games, quantitative data was collected from questionnaire responses, which were then transformed into qualitative data by assigning scores using a Likert scale. Furthermore, the data analysis method used in this academic research is the descriptive statistical method, which is a method for describing and summarising academic research findings concisely and comprehensively using tables and symbols so that the findings are easy to understand when explained (Sugiyono, 2021).

Based on observations and interviews, the game of Monopoly has a number of problems in its development, despite its benefits. One of these is adjusting the level of difficulty of the game to the age of the child. The original rules of Monopoly had to be changed to accommodate children's cognitive growth and understanding, as the game was designed for adults or older children. The duration of the game also needs to be considered so that children do not get bored or frustrated. Games that are too long can cause children to lose interest, while games that are too short can prevent them from gaining the maximum learning experience. In addition to media limitations, teachers' creativity is also limited, which affects the available learning media. From the findings, it can be summarised that the concept of the Monopoly game to present numerical literacy to preschool children has a significant constructive effect.

This game can improve children's understanding of numbers, basic calculations, and monetary values, as well as social skills and decision-making (Hasibuan et al., 2022). With the proviso that adult supervision is required and the rules of the game are modified to accommodate the age and skill level of the children, the game of Monopoly can be used as a successful alternative approach to encourage the development of numeracy and literacy in early childhood. The development of the model in this academic research focused on creating learning media in the form of a

Monopoly game to introduce numeracy and literacy to early childhood in a gradual and enjoyable manner, based on the findings of a needs analysis that had been used. The game was designed taking into account visual aspects, media, and learning methods appropriate to the cognitive development of early childhood. The Monopoly game was developed in several stages, including:

Table 1. Stages in developing a Monopoly Game

Draft model	Several Stages
 Picture 1. Design 1 Monopoly Game	1. Developing the game concept based on the needs identified in the field. 2. Developing media in the form of statements and questions that appear on the Monopoly and game cards. 3. Creating the most attractive design possible in accordance with numeracy literacy indicators.
 Picture 2. Design 2 Monopoly Games	1. To do revision based on suggestions from the teacher and headmaster. 2. To add interactive elements in the form of questions and statements in the game so that children can be more involved in the learning process. 3. To develop the design in accordance with the world of children
 Picture 3: Final Design of Monopoly Game	1. To validate the content with subject matter experts, language experts, and media experts. 2. To refine the design, model, and content of the Monopoly game. 3. To adjust the language and images to be more simple and communicative in accordance with the developmental level of early childhood.

According to the results of expert validation, this Monopoly game has benefits in terms of content suitability for cognitive development stages, simplicity, originality, and creativity in the way questions and statements are presented, as well as its attractive design, all of which make it an effective learning tool for early childhood. The scores from the three validators were as follows: subject matter expert 87.33%, design expert 89.33%, and media expert 90%. Based on the scores from the three expert validators, the Monopoly game is suitable for use as a learning medium. However, changes in children were observed after implementing the medium through pre-tests and post-tests. The results of both tests were as follows:

Table 2. Pre-test, post-test and change or N Gain tables

No	Nama	Pre test	Post test	N Gain/Perubahan
1	A.M	30	63	32.7 %
2	C.S	36	63	26.64 %
3	D.D.R.S	30	62	31.7 %
4	H.N.A	32	62	29.68 %
5	K.M	27	75	47.73 %
6	M.F.A	33	67	30.67 %
7	M.A.R	27	74	46.73 %
8	R.P.S	28	70	41.72 %
9	R.A.P	27	71	43.73 %
10	R.G A.H	29	68	38.71 %
11	R. H S	28	69	40.72 %
12	R.S	30	74	43.7 %
13	S.K.L	36	76	39.64 %
14	Z.H.M	32	67	34.68 %
15	N	34	62	27.66 %
Jumlah		459	1020	556.41
Rata-rata		30.6 %	68 %	37.094 %

Based on the results in the table above, the average pre-test score was 30.6% and the post-test score was 68.0%, with an overall average of 37.09%. Therefore, it can be concluded that there was a change in numeracy literacy before and after using the Monopoly game.

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Early childhood educators can utilise the game of Monopoly as a teaching tool to introduce and improve numeracy literacy skills, based on the results of validation tests, pre-tests, and post-tests, as there are striking differences when examining the above results. Therefore, this game is suitable and useful as a teaching tool. Additionally, the evaluation results from experts in material, design, and media, which indicate the product's suitability, support the opinion of (Sadiman dkk, 2018)

that a good learning tool must meet the aspects of material suitability, design appeal, and user safety. The results of this study are in line with a previous study by (Astutik, dkk, 2020) which revealed that the fruit monopoly game is effective in improving the ability to count from 1 to 10 in early childhood. Similarly, research by (Hasibuan, 2022) which utilised snakes and ladders for numeracy literacy, showed an increase in children's motivation and ability to count. The research by (Kurniasih & Watini, 2022) also confirms that project-based educational games, such as giant snakes and ladders, can improve children's numeracy skills through fun learning activities.

Conclusion

Revitalisation or innovation in learning aids that are important for introducing numerical skills to children at an early age is urgently needed. This is based on a needs analysis obtained from observations that the learning aids available in schools to introduce and improve numerical skills in early childhood are inadequate, and that many other media are still needed to help stimulate children's growth and development. The process of creating a monopoly game as a medium for early childhood literacy learning involves a number of steps: first, doing observations to identify problems and analyse needs; second, conceptualising items to be assembled similar to those needed in the arena; third, creating teaching tools based on the needs analysis that had been initiated previously and doing product validation with validators to find out its strengths and weaknesses; and finally, determining whether the media was successful in introducing numeracy literacy to early childhood. If not, the product would be redesigned. Finally, assess the results of the four steps that have been done.

The development of learning media in the form of a monopoly game for introducing numeracy literacy to early childhood has been effectively used in accordance with the guidance of three validators, namely subject matter experts, design experts, media specialists, and language specialists. The design, which is specifically tailored for children, is easy to understand and appealing to early childhood. Furthermore, the material presented on each box and card in the game covers numeracy literacy indicators, media, and language. The language used is

relatively easy for children to understand, and the tools published are safe for use by young children. Practically speaking, they are compatible for use both outdoors and indoors.

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