PAPER

Development of Board Game Media on Air Theme for Children Aged 5–6 Years

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ABSTRACT

Board games are educational tools consisting of a board with boxes drawn on it. In this game, there are several rules that must be followed, which involve social interaction between children during playtime. This study aims to develop a board game on the theme of air to support children's growth and development as well as enhance their knowledge related to the topic. Moreover, this R&D study employed 4D development with data analysis techniques for validation, practicality, and effectiveness. The data were collected through interviews and expert validation of the product. Moreover, this study has reached the fourth stage, which is dissemination. The population of this study consisted of 65 children aged 5–6 years at Aisyiyah Sicincin Kindergarten, Padang Pariaman Regency. Based on the results, it was found that board game media are effective in promoting children's growth and development in terms of cognitive, linguistic, and motor skills.

KEYWORDS

board game, children aged 5–6

1   INTRODUCTION

Early childhood refers to the stage of growth and development in children. Mulyasa [1] [2] states that early childhood is a period characterized by rapid growth and development, including significant developmental leaps. At this stage, various types of stimulation play a crucial role in the subsequent stage of development. In other words, early childhood is the most crucial and fundamental stage in human development [3] [4].

According to Susanto [5], early childhood refers to children who are between the ages of 1 and 5 years, based on the developmental psychology distinctions between infancy, early childhood, and late childhood. Children at this age exhibit specific characteristics. According to Suryana [6] [7], there are five unique characteristics of early childhood. First, children are egocentric, seeing the world from their own perspective and interests. Second, children have high curiosity, which varies greatly

depending on what attracts their attention. Furthermore, the children are unique, full of imagination and fantasy. Lastly, they have a short-term attention span.

In addition, early childhood education is provided to children aged 0 to 6 years old and should be tailored to the stages of children's growth and development. Based on Regulation of the Minister of Education and Culture No. 18 of 2018 concerning the provision of early childhood education (PAUD) services, early childhood education is defined as "a coaching effort aimed at children from birth to the age of 6, which is carried out through the provision of educational stimuli to help them grow physically, develop mentally, and prepare them for the next level of education." Additionally, it also plays a role in stimulating, guiding, nurturing, and providing learning activities to develop children's abilities and skills. It also contributes to environmental management efforts based on their development and guidelines from integrated healthcare centers [8] [9].

Early childhood education has several characteristics and special features. According to Ariyanti [10] [11], there are four special characteristics of early childhood education. First, education should aim to develop all aspects of humanity. In other words, education should aim to develop students' intellectual intelligence (IQ), emotional intelligence (EQ), spiritual intelligence (SQ), multiple intelligences, and other forms of intelligence. Secondly, it should prioritize activities that encourage the active participation of children so that students can experience a variety of things that involve all aspects of their physical, mental, and psychological well-being, as well as engage their senses. Third, it should involve more playtime to make learning fun and enjoyable, as children are fond of learning through play. Lastly, creating art and participating in physical education are the primary activities conducted in a supportive and joyful learning environment.

Media are all tools that can be used as intermediaries in a lesson. According to Hamid JoJo [12] and Briggs [13] [14], all forms of intermediaries that people use to spread and convey ideas can be categorized as media. In the learning process, media is beneficial for teachers because it helps students understand the conveyed information easily.

Broad games are one of the most useful learning tools for early childhood education. A board game is a game that utilizes a board containing educational materials and rules to govern the game, fostering social interaction among players. Thus, this game can foster the thinking, problem-solving, and decision-making skills of the students [15] [16]. Moreover, board game media can be appropriately designed according to the theme and learning objectives. To conclude, a board game is a beneficial learning tool that can be easily designed to align with the theme and desired learning outcomes.

2   MATERIALS AND METHODS

This is an R&D research employing a 4D model consisting of four stages: define, design, develop, and disseminate. According to Suryaningtyas [17] [18], the first stage is the define stage, which aims to find information by conducting a needs analysis. The second stage is the design stage, which aims to create a design for learning media. The third stage is the development stage, in which the learning media is produced. The final stage involves validating, testing, revising, and distributing the product to the field.

This study is at the dissemination stage, which is the final stage of the 4D model. At this stage, a board game specifically designed around the theme of air was

distributed and utilized during the learning process at Aisyiyah Sicincin Kindergarten in Padang Pariaman Regency. Additionally, the dissemination stage involved conducting trials and analyzing the trial results.

2.1 Product trial

Product trials are as follows:

Trial design. The trial for board game media was conducted as an initial step to determine the effectiveness, applicability, and practicality of using board game media in the learning process. The trial at the development stage was carried out at Aisyiyah Sicincin Kindergarten in the Padang Pariaman district. The data were collected from expert validation results, documentation, and children's learning outcomes. Moreover, the designed product was based on the theme of "air." In the learning activity centered around air, the product is a board game filled with various images related to air. In addition, command cards were created for the children to draw and follow the instructions on the card precisely.

Subject. The subjects of this study were 65 students from Aisyiyah Kindergarten in Sicincin, Padang Pariaman District. These students were in four classes: B1, B2, B3, and B4.

Types of data. This study employed both quantitative and qualitative data. Quantitative data were obtained from the results of tests and observations. The test was conducted to assess the validity of the board game media development. Furthermore, qualitative data were collected through interviews with teachers and students.

2.2 Instruments for data collection

Various instruments, including validation and observation sheets along with a lesson plan, were used to collect the data. Additionally, interviews with the teacher and the students were conducted to assess the effectiveness of the board game.

2.3 Technique of data analysis

The obtained data was then analyzed to address questions concerning the validity, practicality, and effectiveness of the designed media. The data analysis technique used involved analyzing the validation of the instrument, the implementation of the product, and its effectiveness.

This analysis was conducted to assess the validity of the designed learning media. To determine the level of validity, the formula used is as follows:

$$P = \frac{F}{N} \times 100\%$$

Where:
P = Percentage of average score of validation results
F = Average score from each validator
N = Maximum score obtained
Analysis of the data was based on the following criteria (see Table 1):

Table 1. Validity criteria

SV	Criteria	Note
75% ≤ SV ≤ 100%	Valid	Used
50% ≤ SV < 75%	Revision Required	Minor revision
25% ≤ SV < 50%	Revision Required	Major revision
0% ≤ SV ≤ 25%	Invalid	Deleted

Note: Adopted from: Hobri, 2010.

Analysis of implementation results. This analysis aimed to observe the impact of board games on students' learning activities. To analyze the results, the following formula is used.

$$SP = \frac{Sr}{Sm} \times 100\%$$

Where:
SP = Percentage of average score of observation
Sr = The mean score of the implementation from each observer
Sm = The maximum score obtained
The implementation criteria are displayed in following Table 2:

Table 2. Implementation criteria

SP	Implementation Criteria
80% ≤ SP ≤ 100%	Very Good
60% ≤ SP ≤ 80%	Baik
40% ≤ SP ≤ 60%	Kurang baik
SP ≤ 40%	Tidak baik

Note: Adopted from Hunri, 2010.

Analysis of the effectiveness of the product. To determine the effectiveness of the product, an analysis was conducted using the following formula:

$$SE = \frac{t}{N} \times 100\%$$

Where:
SE = Percentage of the effectiveness
t = Number of students who got high score
N = Total number of students
It is considered effective when at least 70% of students achieve high scores. Given that it is tailored to the field's requirements, the SE outcomes should reach a minimum of 70% to be considered effective.

3 FINDINGS AND DISCUSSION

At an early age, children are very fond of games that are interesting and fun. As a matter of fact, a board game is one of the game designs that are effective for

educational purposes. Thus, it can serve as a learning tool to assist the teacher in delivering materials. In playing the board game, players need to follow certain rules that involve social interaction among players. Furthermore, the material inserted into the game can enhance students' critical thinking, problem-solving skills, and decision-making abilities [18] [19].

A board game is a game played on a board using characters or pawns in which players are required to follow specific commands based on the selected cards. Another required tool to play this game is a dice. In recent years, board games have become increasingly popular and are now one of the most played types of games for several reasons [20]. First, a board game is a game that requires more than one player; therefore, it can help develop social skills. Secondly, board games have interesting variations throughout their development. Thirdly, this game is affordable. Lastly, it does not have an age limitation, meaning that everyone can play the game.

This board game has several rules, starting with acquiring the board, dice, and cards. Then, each player determines the order of play. The players take turns rolling the dice and drawing a command card. The person who reaches the finish line first is the winner [21]. Therefore, board games are a fun learning medium that provides stimulation for children's growth and development.

In this study on the development of board game media, the theme "air" was utilized. Moreover, the activities that are easily adapted to the characteristics of children aged 5–6 years are designed to be as attractive as possible. This approach helps in developing all aspects of children's development, particularly those related to cognitive, language, social-emotional, physical-motor, artistic skills, and other aspects. According to Shafariya et al. [18], playing board games benefits students in several ways: breaking through device addiction, improving focus, regulating emotions, fostering a competitive spirit, and creating a fun atmosphere during learning.

This board game is designed based on the characteristics and developmental indicators of children aged 5–6 years, which include:

3.1   Religious and moral values

At the ages of five and six, there are some indicators of children's development in terms of religious and moral aspects. At this age, children are able to identify the religion they adhere to, imitate religious practices, greet and pray, behave in an honest and polite manner, and maintain personal and environmental hygiene [20].

3.2   Physical and motor

According to Yenny [20], at the age of 5–6 years, children's physical-motor development includes imitating movements, jumping, running, climbing stairs, and performing right- and left-hand movements [17].

3.3   Language

Based on the indicators of linguistic development, children should be able to listen to other people's words, recognize animal sounds around them, answer questions, understand several commands, repeat more complex sentences, understand the rules of games, and enjoy and appreciate reading [15].

3.4 Cognitive development

In cognitive development, children aged 5–6 years are capable of engaging in exploratory and investigative activities, solving simple problems, demonstrating creativity, distinguishing tastes, and recognizing objects based on their use [8].

3.5 Social-emotional development

Children aged 5–6 years should be able to have self-confidence, take care of themselves and their surroundings, help those in need, and share with friends [9].

3.6 Arts

Children at this age should be able to sing a song, play instruments, engage in simple role-play, draw various shapes, paint, and create simple artwork [11] [20] [21] [22] [23].

This study has been carried out in the dissemination stage. The interview with teachers was conducted to identify the obstacles and challenges they face while teaching within the context of the theme "air." After identifying the issues faced by the teachers, the solution was to design a board game. Furthermore, materials related to the theme of "air" were incorporated into the board game. The next step was design validation, examining the appropriateness of the media for the students' needs as well as the benefits and drawbacks of the media. In this process, five experts—one expert in media design, two experts in materials, and two experts in lesson planning—were appointed to be validators.

Table 3. Validation result

No	Validators	Percentage of Result (%)	Note
1	Expert of language (Lesson plan)	84.37%	Good
2	Expert in Material Development	95.62%	Very Good
3	Expert in Media design	88.23%	Very Good

Based on the results presented in the Table 3 above, it can be concluded that the board game learning media has been deemed valid and can be utilized as a tool for children's holistic development.

Furthermore, the analysis results of implementing board game media with an "air" theme in kindergarten for children at Aisyiyah Kindergarten, Sicincin, Padang Pariaman Regency are presented in Table 4.

Table 4. Boardgame implementation results

Classes	Observation Results (%)			The Mean Score (%)
	1st Observation	2nd Observation	3rd Observation	
B1	91.90	91.80	96.70	95.87
B3	80.13	75.81	82.25	79.31
B4	95.01	98.5	91.25	94.92
B2	80.26	80.0	90.8	83.67

The mean score of the observations in each class presented in Table 4 indicates that the utilization of board game media was highly effective across all classes. Based on the effectiveness criteria, this media has been proven effective, as 88.4% of students showed improvement in cognitive, linguistic, and social-emotional aspects of learning.

Figure 1 displays the board game with the theme, My Country.

Fig. 1. The board game before revision

Fig. 2. The board game after revision

The commands on the command cards were designed to align with the developmental indicators of children who enjoy playing games. Furthermore, the command cards contain materials related to the air theme. Here are the contents of the air-themed board game command cards:

1. Guess the following picture.
2. Color this following plane.
3. Find a circle object.
4. Mention the number.
5. Count the fingers.
6. Determine the order of play.
7. Imitate the sound of rocket.
8. Practice the sit-squat.
9. Practice the hip rocking.
10. Walk like a robot.
11. Stand on one leg for 10 seconds.
12. Close your eyes with your right hand.
13. Jump three times while counting.
14. Stand on one leg for 5 seconds.
15. Guess the picture based on its shape.
16. Do the instructions according to the picture.
17. Compare a plane and a rocket.
18. Have curiosity about objects that can be flown in the air.
19. Imitate the sound of a bird.

With the command cards adapted to the air theme, all aspects of children's development can be well developed. Thus, this learning media can be adapted to the curriculum implemented in kindergarten.

4   CONCLUSION

Based on the findings, it is proven that the designed board game media with an "air" theme can help improve all aspects of the development of children aged 5–6 years. This learning tool is considered effective because all children enjoy games. In addition, the development process of learning media can help teachers create creative learning materials and engage children's interest through specific themes.

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