



Development of Smart Kiddo Games as an Effort to Improve Physical Motor and Language Abilities in Early Childhood

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Abstract: Sensitive period is when children quickly learn and build mindsets through experiences. This research aims to develop Smart Kiddo Games as an Effort to Improve Physical Motor and Language Ability in Early Childhood. This research is Research and Development using the approaching model developed by Borg & Gall. Starting with a preliminary study, planning, and game product development, continued to the product validation stage (game model) by two material expert validators and two game experts. Product validity analysis using the Aiken formula. Based on the results of the validity test of the assessment instrument by material experts and game experts, all showed results ≥ 0.05 (valid). Thus, it can be concluded that Smart Kiddo Games are appropriate for use in learning as an effort to improve the physical motoric and language abilities of early childhood. Furthermore, it is hoped that it can become one of the most effective and enjoyable early childhood learning strategies, according to the principles and stages of early childhood development.

Abstrak: Masa peka merupakan periode, dimana anak dengan mudah mempelajari dan membangun pola pikir melalui pengalamannya. Penelitian ini bertujuan untuk mengembangkan *Smart Kiddo Games* Sebagai Upaya Meningkatkan Kemampuan Fisik Motorik dan Bahasa Anak Usia Dini. Penelitian ini merupakan penelitian pengembangan (*Research and Development*) menggunakan model pendekatan yang dikembangkan Borg & Gall. Diawali dengan studi pendahuluan, perencanaan dan pengembangan produk permainan, dilanjutkan hingga tahap validasi produk (model permainan) oleh dua validator ahli materi dan dua ahli permainan. Analisis validitas produk menggunakan rumus Aiken. Berdasarkan hasil uji validitas instrument penilaian oleh ahli materi dan ahli permainan, semua menunjukkan hasil $\geq 0,05$ (valid). Dengan demikian, dapat disimpulkan bahwa *Smart Kiddo Games* layak digunakan dalam pembelajaran sebagai upaya meningkatkan kemampuan fisik motorik dan bahasa anak usia dini. Dan diharapkan dapat menjadi salah satu strategi pembelajaran anak usia dini yang efektif dan menyenangkan, sesuai prinsip dan tahapan perkembangan anak usia dini.

A. Introduction

Childhood begins when a child is born and reaches the age of six. All aspects of a child's development—physical, cognitive, linguistic, and social-emotional will develop in this period according to the stages of his development. Language and physical motor skills are the two most essential skills that must be developed in early childhood. According to (Fadlan & Pratama, 2019), physical motor development is the process by which a child's nerves and muscles mature and grow in his ability to move. Physical-motor skills are divided into two categories in the standards of achievement of early childhood development: gross motor and fine motor. They maximize a child's strength, endurance, speed, agility, flexibility, coordination, accuracy, and balance in physical fitness (Rismayanthi, 2018). This is the first time the child has been able to respond to responses through movement, and physical development is the foundation. Physical development includes grasping, twisting, and kicking in a child (Novitasari et al., 2019). According to (Hurlock, 1978) motor development can be defined as the ability to control physical movement through the coordinated activity of nerve centers, veins, and muscles. Gross motor development and fine motor development are two parts of physical development. Gross motor gestures are influenced by a child's maturity and involve using large muscles or most limbs. Physical fitness and health include endurance, strength, coordination, speed, agility, balance, flexibility, and accuracy (Rismayanthi, 2018).

Based on the Regulation of the Minister of Education and Culture No.137 of 2014 concerning National Standards for Early Childhood Education (Kementerian Pendidikan dan Kebudayaan, 2014) "Regarding the level of achievement of children aged 4 to 5 years in the field of gross motor, including imitating animal movements; airplanes or trees carried by the wind; carrying out hanging actions; perform jumping actions; sprinting, jumping, and coordinated running; throwing something purposefully; catching something exactly; making anticipatory movements; kicking objects purposefully; using the means of playing outside the classroom". All body movements are referred to as motor activities, divided into gross and fine motor skills. Both academic and daily activities require motor skills. Activities in developing delicate motor aspects commonly carried out in everyday life, such as dressing, brushing your teeth, using spoons and forks, tying shoes, and so on, are examples of academic activities that children usually do, such as writing, cutting, coloring, folding, drawing lines, and so on (Hasanah, 2016).

Gross motor aspects can also be developed through play. By playing, the child can channel energy that indirectly develops all aspects of development, including motor physique, which the child performs with pleasure without coercion. The world of children is a world that actively moves and plays, a world that cannot be separated from physical activity by play (Hasanah, 2016; Rozana, 2019). In addition to the motor physique, there is one aspect that is no less important, namely the aspect of language skills. A language is an essential tool in the life of each individual. Because language skills are a means by which humans express their feelings, thoughts, ideas, and aspirations (Obiweluzo & Melefa, 2014). In other words, language skills are used as a means of communication with others,

and their scope includes: 1) receptive language: receiving messages from the interlocutor and then carrying them out; 2) expressive language: able to express the desire to be conveyed either from body language, or symbols that have been agreed upon and 3) literacy: children's ability to read and write before learning how to read and write (Ban PAUD-PNF, 2022).

Language ability is an aspect of human ability from birth, language skills are divided into 4 (four) namely listening, speaking, reading, and writing. Language development in children is significant because it is the basis for mastering other abilities. Language is the main form of expression of thoughts and knowledge when the child communicates with others (Isna, 2019).

The level of achievement of early childhood language development (Ministry of Education and Culture, 2014) includes: 1) Understanding language: listening to other people's words (in their native language or another language), understanding two commands simultaneously, understanding the stories read aloud, and knowing vocabulary for adjectives such as "naughty", "stingy", "benevolent", "courageous", and "ugly" Hearing and recognizing sounds in Indonesian (for example, sound and discourse should be similar); 2) Language Revealed: Using adjectives to describe one's emotions (e.g., "good", "happy", "naughty", "stingy", "kind", "brave", and "ugly"), asking questions the right way, and repeating simple sentences Saying known words, Expressing opinions to others, Conveying explanations behind something desired or refuted, Retelling stories/fantasies you've heard, Refining jargon, Participating in discussion; 3) Literacy: Make meaningful doodles, recognize the sounds of animals and surrounding objects, recognize symbols, and imitate the letters A-Z.

Teachers are expected to be able to communicate effectively to develop children's receptive and expressive language, as well as use methods and media that are appropriate to the needs of early childhood. Each part of a child's development generally has a similar progressive pattern or phase, but each child's achievements in each part of the development are unique. This difference is because it is influenced by the preparation period, commonly called the sensitive period (Paramita & Sufiati, 2020). The sensitive period, also known as the "golden age", is a time in a child's life when it is easy for them to learn and develop a perspective on the world around them. So far, children must be stimulated according to the principles of early childhood learning, such as playing with learning sauces or learning while playing (Paramita & Sufiati, 2020; Risdianti, 2019). Children can maximize physical growth and develop expressive and exploratory abilities by playing (Mahardika et al., 2022). Noorlaila (in Sari, 2018) explains that early development significantly impacts child development in later stages and can increase adult work productivity.

Based on the results of field observations to analyze learning needs, especially physical motor and language in teachers in several kindergarten institutions in the Kediri region, it is stated that 1) methods that are often used to stimulate gross motor skills through gymnastics, walking, imitating movements and using outdoor games available at the institution. 2) stimulating children's language skills, usually through LKA and question and answer activities. 3) About 60% of teachers have never used a child's spiced game to

stimulate physical motor and language skills in a child due to time, place, and cost constraints. The teachers also said that during the Covid-19 pandemic, children were not facilitated in developing their abilities and did not do physical activity because they were busy playing with gadgets during learning-from-home (BDR) activities. During the Covid-19 pandemic, the use of electronic devices by children is varied enough to cause several impacts, including children's inability to communicate with others decreases, their motor skills deteriorating, and children who spend too much time using electronic devices and rarely move more likely to increase obesity, irritability, emotions, and anxiety, which can lead to depression (Hafilda et al., 2022; Gunawan, 2017).

According to White play activities lay the foundation for lifelong learning. This implies that learning is a process that lasts a lifetime and begins with playing at a young age. Starting with playing while learning (greater play elements) and continuing to learning while playing (greater learning elements), play activities must be adapted to the individual development of each child (Dwiyanti et al., 2018). Play can help a child develop his body muscles, stimulate his senses, explore and recognize his environment, and develop his intelligence, social skills, and emotional well-being in various ways. Psychologists also state that the early years of life are the most important period among other stages of development. The child is believed to have experienced significant experiences in this period (Savira et al., 2022).

It is necessary to develop simple, fun, and safe circuit games to train children's physical motor skills while developing their language skills at school. Children are expected to be more interested in learning as a result of these circuit game activities. In accordance with the findings of the Animate Game development research (Sistiarini, 2021) which explains that these games have proven to be useful for learning activities, the game model is attractive, easy to use, and proven to improve early childhood motor skills. Another research (Savira et al., 2022) on the development of Geometry Fun Circuit Play also states that circuit games can be a fun learning alternative and can motivate and stimulate all children's abilities. Educators will also be more helpful in instilling values in forming all children's potential, especially in physical motor and language abilities (Pramono & Aisyah, 2018; Vina & Sufiati, 2020).

Researchers finally looked for alternatives to design and develop a circuit game that can improve children's motor and language physical abilities by paying attention to aspects of comfort, safety, attractiveness, and effectiveness for early childhood learning based on the description above and the requirements for circuit games. Therefore, a study conducted with the title "Development of Smart Kiddo Games as an Effort to Improve Motor Physical Abilities and Early Childhood Language" was conducted by researchers. Smart Kiddo Games is designed to help young children develop their language and motor skills. It is named Smart Kiddo Games, which stands for "Smart Kids Education Games" from an English word that means Smart Kids Educational Games/ Games. The benefits of Smart Kiddo Games include 1) Training children's physical motor skills in strength, speed, agility, flexibility, and balance; 2) Training children's language skills in listening and understanding

the instructions given, training children's ability to read and write beginnings; 3) Make learning fun and meaningful for children.

B. Method

This research uses quantitative methodology. This research is a research and development model "Research and Development" (Borg & Gall, 2003). This research is to develop and validate educational products (Borg & Gall, 2003). The procedure for developing this research: 1) research and information collecting; 2) planning; 3) developing the preliminary product. This research is only up to the product validation stage (game model), and to see the product's effectiveness will be continued in the following research. The following is presented with pictures and explanations of the research flow:

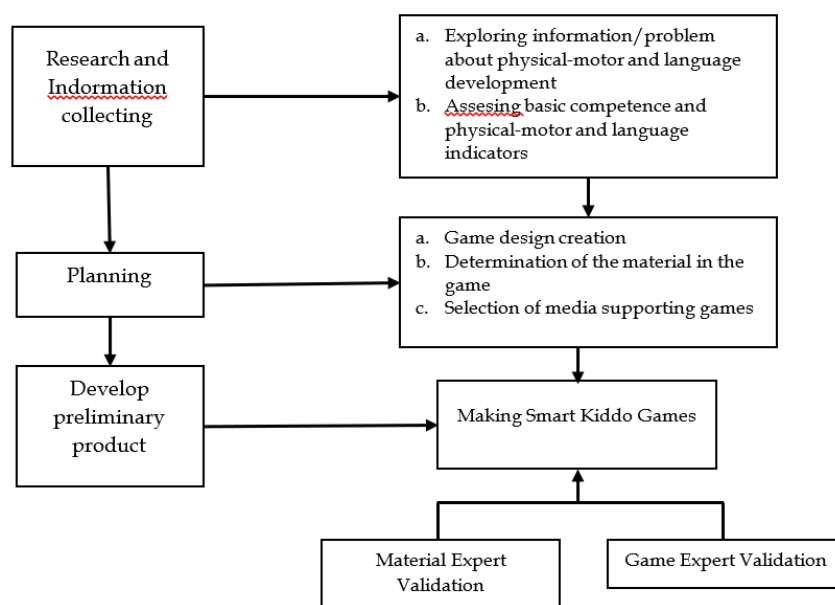


Figure 1. Smart Kiddo Games development research model

1. Analysis

The analysis activity was carried out by conducting a field survey of several kindergarten institutions in the Kediri area through interviews with the head of the kindergarten and class teacher. This interview was conducted to obtain information about the situation, condition, and problems with the child's motor and physical language abilities.

2. Planning

The planning stage begins with creating the design and concept of the games listed in the game draft. The draft games that have been made are then presented in FGD (focus group discussion) with several materials and game experts in the field of early childhood education. This is so that the game to be made can be helpful to and by aspects of early childhood development. The implementation of the FGD resulted in the creation of storyboards and circuit game content materials as well as game content on motor physical capabilities, including 1) flexing the body; 2) maintaining balance; 3) speed/agility; 4) leg

strength. And on language skills children are trained to 1)listen; 2)search for letters; 3)arrange letters into a word; 4)Read/spell words.

3. Development

The development stage is developing the draft design into a complete game model. The finished game was presented again in an FGD (focus group discussion) with several material and game experts in early childhood education. Through FGD, Smart Kiddo Games will be validated.

Data analysis of product feasibility (game model) in the form of questionnaires by two validators from lecturers of the Early Childhood Education study program and two Early Childhood Education practitioners/educators. Validity data analysis technique with coefficient V Aiken (Bashooir & Supahar, 2018).

C. Result and Discussion

1. Smart Kiddo Games Development

The result of the development of the Smart Kiddo Games game model is by stringing together several motor-physical activities with a combination of language activities packaged in the form of circuit games, consisting of four-game posts that need to be passed and challenges that the child needs to complete. The steps of the game are as follows:

- a. The teacher divides the child into two groups.
- b. Then the teacher explains the rules of the game.
 - The teacher gives a clue to the two children representing each group to guess, "am I....I am a two-legged animal... every morning I crow... and I lay eggs too".
 - The child stands, steps on the base of the circle, steps on the second pedestal, then takes the first pedestal to move in front of him to be stepped on towards the second game post.
 - The child takes a picture according to the answer in the form of a picture card, "chicken picture."
 - Child passes playmate winding road to get to post 3.
 - The zigzag child passes through the cone to the fourth post.
 - Children, according to the footwear drawings that have been provided.
 - The child arranges the letters into a word according to the image taken: a-y-a-m.
- c. Each group will race to complete the challenge on the circuit game "Smart Kiddo Games".
- d. For the group to complete the challenge and be able to arrange the letters according to the most pictures that become champions.

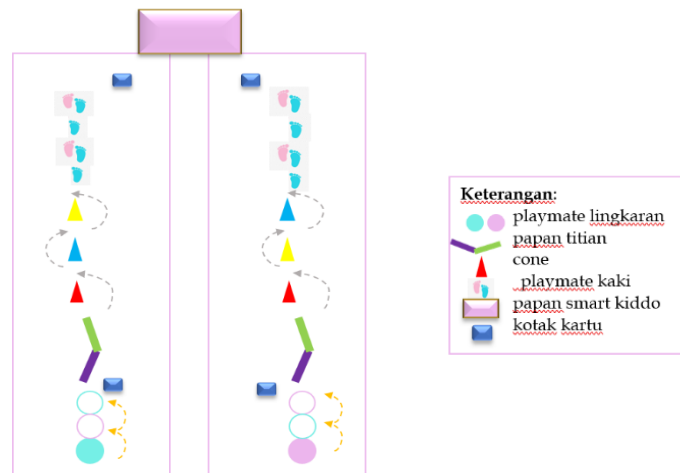


Figure 2. Smart Kiddo Games Circuit Models

2. Feasibility of Smart Kiddo Games as an effort to improve physical abilities, motor, and language of early childhood

a. Feasibility assessment from a Material Expert

The assessment of material feasibility was carried out by 2 experts, namely 1 lecturer in the Department of Early Childhood Education Teacher Education and 1 Kindergarten teacher. The aspects assessed include: 1) the suitability of the material with KD; 2) the suitability of the material for group A children; 3) the collapse of the game concept; 4) the game helps to get to know the early literacy; 5) the suitability of the letter/word material; 6) suitability of the drawing material; 7) visual readability of letter/image components; 8) the breadth of the material to the developmental aspects; 9) the presentation of the material attracts the child's interest in learning and curiosity; 10) games hone the child's basic movement skills; 11) effectiveness and efficiency of competency achievement.

Table 2. Results of data analysis of the validity of the Smart Kiddo Games by Material Experts

Item	V (Aiken Analysis)	Description
Item 1	0,75	Valid
Item 2	0,75	Valid
Item 3	0,50	Valid
Item 4	0,63	Valid
Item 5	0,63	Valid
Item 6	0,63	Valid
Item 7	0,63	Valid
Item 8	0,50	Valid
Item 9	0,63	Valid
Item 10	0,50	Valid

Item	V (Aiken Analysis)	Description
Item 11	0,50	Valid

Based on the analysis of Aikens calculation data, the validity values in table 2 for each indicator ≥ 0.05 shows that the validity values of each aspect are valid. Thus, it can be said that based on the assessment of material experts, the materials in Smart Kiddo Games are appropriate and suitable for the development of early childhood abilities, especially motor and physical language abilities.

b. Feasibility assessment from a Game Expert.

The assessment of material feasibility was carried out by 2 game experts, namely 1 lecturer in the Department of Early Childhood Education Teacher Education and 1 Kindergarten teacher. The aspects assessed include: 1) The use of exciting game titles; 2) the game is easy to play; 3) Game tools and materials are easy to can; 4) the rules of the game are precise and easy to understand; 5) the suitability of the game to the learning objectives; 6) the suitability of the gameplay; 7) suitability of games for group children; 8) the game is following the essential competencies to be achieved; 9) the fun of games for children; 10) the game is safe for children to play; 11) the game includes basic motion skills and early literacy skills.

Table 3. Results of data analysis of the validity of the Smart Kiddo Games by Game Experts

Item	V (Aiken Analysis)	Description
Item 1	0,75	Valid
Item 2	0,63	Valid
Item 3	0,50	Valid
Item 4	0,63	Valid
Item 5	0,63	Valid
Item 6	0,63	Valid
Item 7	0,50	Valid
Item 8	0,50	Valid
Item 9	0,75	Valid
Item 10	0,75	Valid
Item 11	0,75	Valid

Based on the analysis of Aikens calculation data, the validity values in table 3 for each indicator ≥ 0.05 shows that the validity values of each aspect are valid. Thus, it can be said that based on the assessment of game experts, the material in Smart Kiddo Games is

appropriate and worthy of being used as a learning strategy to improve early childhood abilities, especially motor and physical language abilities.

Discussion

This development research is only carried out until the product validation stage. Several stages have been carried out 1) conducting field surveys to several kindergarten institutions to obtain information related to situations and conditions as well as problems with children's motor and language physical abilities; 2) planning begins with the design of the design and concept of the games listed in the game draft, then presented in an FGD (focus group discussion) with several experts in the field of early childhood education; Then proceed to carry out the development of the draft design into a complete game model. Several experts then validate the finished games. Smart Kiddo Games' motor physical skills include: 1) flexing the body; 2) maintaining balance; 3) speed/agility; 4) leg strength. And on language skills children are trained to 1) listen; 2) search for letters; 3) arrange letters into a word; 4) read/spell words.

This Smart Kiddo Games circuit game model development product went through several processes until it became the final product, and went through several revisions for improvement. The world of children is actively moving and playing, a world that cannot be separated from physical activity by play (Hasanah, 2016; Rozana, 2019). In addition to the motor physique, there is one aspect that is no less important, namely the aspect of language skills. A language is an essential tool in the life of each individual. Because language skills are a means by which humans express their feelings, thoughts, ideas, and aspirations (Obiweluzo & Melefa, 2014). Language skills in early childhood begin with early recognition of literacy. So that learning activities are considered important to provide a direct and fun learning experience for children. Play activities for denim-age children can be packaged in a circuit game model. This is in line with the opinion (Savira et al., 2022), which states that circuit games can be a fun learning alternative and motivate and stimulate all children's abilities. Added by (Pramono & Aisyah, 2018); (Vina & Sufiati, 2020) states that pleasant learning situations help educators instill values in the formation of all children's potential, especially in motor and physical language abilities.

Given the results of the validation/proof of eligibility of the Smart Kiddo Games game model, it is possible to use it in children's learning activities because, through play, the child can train the muscles of the body, stimulate the child's senses, investigate and explore the situation of the environment around the child, in addition, children can receive different rewards for the improvement of motor skills, language abilities, intelligence as well as social-emotional abilities. Psychologists also state that the early years of life are the most critical period among other stages of development. The child is believed to have experienced significant experiences in this period (Savira et al., 2022).

D. Conclusion

The conclusion is based on the results of the analysis that the material in Smart Kiddo Games is feasible and suitable for developing early childhood abilities, especially in terms of physical motor and language abilities, obtained based on the results of expert validity tests. 1) The assessment of material eligibility in the Smart Kiddo Games was carried out by two material experts, namely one lecturer at the Department of Early Childhood Education and one Kindergarten teacher, especially on physical motor and language abilities, all of whom received valid results, namely each indicator ≥ 0.05 . Thus, it can be said that Smart Kiddo Games is appropriate and feasible to be used to develop early childhood abilities, especially physical motor and language abilities; likewise 2) based on the assessment of game experts conducted by two game experts consisting of one lecturer at the Department of Early Childhood Education and one Kindergarten teacher, the game model in Smart Kiddo Games is appropriate and feasible based on the assessment results of each indicator ≥ 0.05 (valid). So that games can be used as a learning strategy as an effort to improve early childhood skills, especially in physical motor and language abilities.

As for suggestions in implementing further research, researchers can innovate by developing other games that can develop more than one area of early childhood development, that is, by the stages of development.

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