Jurnal Pendidikan Anak Usia Dini Undiksha
Volume 12, Nomor 2, Tahun 2024, pp. 320-328
P-ISSN: 2613-9669 E-ISSN: 2613-9650
Open Access: https://doi.org/10.23887/paud.v12i2.76524

Foot Hula Hoop Game: An Innovative Approach to Stimulating Agility in Early Childhood Education

Irana Anwar[1], Pramono[2*], Munaisra Tri Tirtaningsih[3]

[1,2] Pendidikan Guru Pendidikan Anak Usia Dini, Universitas Negeri Malang, Malang, Indonesia

ARTICLE INFO

Article history:
Received March 17, 2024
Accepted July 22, 2024
Available online August 25, 2024

Kata Kunci:
Permainan, Hulahop Kaki, Kelincahan, Anak Usia 5-6 Tahun

Keywords:
Game, Foot Hulahop, Agility, Children Aged 5-6 Years

ABSTRAK

Masalah yang ditemukan dalam penelitian ini adalah rendahnya kelincahan pada anak usia 5-6 tahun, yang mempengaruhi kemampuan motorik mereka. Salah satu cara untuk mengatasi masalah tersebut adalah melalui permainan yang dapat merangsang kelincahan anak. Tujuan penelitian ini adalah untuk menghasilkan produk permainan hulahop kaki yang layak digunakan sebagai stimulasi kelincahan pada anak usia 5-6 tahun. Penelitian ini menggunakan metode Research and Development *(R&D) dengan mengadaptasi model Borg and Gall yang dimodifikasi oleh Sugiyono. Penelitian ini terdiri dari sembilan langkah, yaitu: potensi dan masalah, pengumpulan data, desain produk, validasi desain produk, revisi desain produk, uji coba kelompok kecil, revisi hasil uji coba kelompok kecil, uji coba kelompok besar, dan penyempurnaan produk akhir. Data kuantitatif diperoleh melalui angket validasi dari ahli permainan anak usia dini, ahli materi, dan validasi pengguna (guru) pada saat uji coba kelompok kecil dan kelompok besar. Data kualitatif diperoleh dari saran dan masukan ahli validasi, pengguna (guru), hasil wawancara awal, dan catatan observasi. Subjek penelitian ini adalah anak usia 5-6 tahun, yang terdiri dari 6 anak pada uji coba kelompok kecil dan 41 anak pada uji coba kelompok besar. Simpulan penelitian ini adalah permainan hulahop kaki sangat layak digunakan sebagai stimulasi kelincahan pada anak usia 5-6 tahun.*

ABSTRACT

The issue identified in this study is the low level of agility in children aged 5-6 years, which affects their motor skills. One way to address this issue is through games that can stimulate the agility of children. The aim of this study is to develop a foot hula hoop game that is suitable for stimulating agility in children aged 5-6 years. This research employs the Research and Development (R&D) method, adapted from the Borg and Gall model as modified by Sugiyono. The study follows nine steps: identifying potential and problems, data collection, product design, product design validation, product design revision, small group trial, revision based on small group trial results, large group trial, and final product refinement. Quantitative data were collected through questionnaires validated by early childhood game experts, content experts, and user validation (teachers) during the small and large group trials. Qualitative data were obtained from expert feedback, teacher input, initial interviews, and observational notes. The research subjects were 5-6-year-old children, with 6 children involved in the small group trial and 41 children in the large group trial. The conclusion of this study is that the foot hula hoop game is highly suitable for stimulating agility in children aged 5-6 years.

1. INTRODUCTION

Early childhood is children aged 0-6 years who are involved in exploring various free movement activities with the aim of optimizing aspects of child development (Asmuddin et al., 2022; Rahman & Khadijah, 2023). Early childhood is the initial foundation in the development and growth of children as a physical and mental preparation that is useful for the child's future. Aspects of development in children consist of six aspects, namely aspects of religious and moral values, cognitive, art, social emotional, language and physical motor skills (Arifudin et al., 2020; Zaini & Dewi, 2017). These six aspects need to be stimulated well so that they can grow and develop optimally. The physical motor aspect is one aspect that needs to be

*Corresponding author.
E-mail addresses: pramono.fip@um.ac.id (Pramono)

developed, this aspect is the ability to coordinate the nervous system, muscles, spinal cord and brain in producing a movement (Apriloka, 2020; Robingatin et al., 2022).

Motor skills are divided into two, namely fine motor skills and gross motor skills. Gross motor skills are body movement skills through large muscle movements, either partially or completely, that are needed to perform movements such as running, standing, sitting, going up and down stairs, kicking, etc. Basic movements are divided into three abilities, namely locomotor, non-locomotor and manipulative movements. Locomotor movements are movements to move the body from one place to another, for example when walking, running, sliding, jumping and hopping (Merdekawati et al., 2019; Rusmiyadi et al., 2021). Non-locomotor movements are movements that are done without moving from one place to another, such as bending, circling, turning, stooping, stretching, shaking the head and swinging (Rahmatia et al., 2021; Sartika et al., nd) . Meanwhile, manipulative movements are movements that involve playing with certain objects or tools, such as balls, with variations of movements such as kicking, catching, bouncing or throwing (Borba et al., 2017; Gallahue et al., 2011). Having good gross motor skills can provide benefits, namely training children's large muscles and obtaining mature and healthy physical abilities in the future (Rahmayuni & Hazizah, 2020; Yudaparmita & Adnyana, 2021). Good gross motor activities can improve children's motor skills. If a child is unable to perform physical movements well, it can cause a lack of confidence in the child's abilities.

According to the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 137 of 2014 concerning national standards for early childhood education regarding the level of gross motor achievement of children aged 5-6 years including: a) performing coordinated body movements to train flexibility, balance, and agility; b) coordinating eye, foot, hand, head movements in imitating dance or gymnastics; c) playing physical games with rules; d) being skilled in using the right and left hands; e) carrying out personal hygiene activities. Physical motor development is interrelated with elements of physical fitness. One element of physical fitness is agility. Agility is not an element that stands alone but a combination of components such as strength, coordination, flexibility and reaction time (Komaini, 2019; Mahmud, 2019). Agility can also be interpreted as the skill to change body movements quickly without falling. Agility ability is one aspect of gross motor skills for 5-6 year olds that needs to be developed, while other elements include coordination, balance, strength and flexibility (Magfiroh et al., 2020; Sulistyo et al., 2021)**.** Having good agility skills has benefits for the body, such as being able to perform various movements easily without losing balance and also without experiencing injury (Pranata & Sarwita, 2019; Taufiqurrahman et al., 2024). Not only that, agility can make it easier for children to solve problems related to sports abilities by having good motor skills (Rizki & Aguss, 2020; A. Yulianti, 2020). Good agility makes it easy for the body to move quickly and precisely without feeling any difficulty. So, the ability of agility is very important for children to have because it has important benefits for the child's body.

Games are one way to stimulate agility in children. Games are activities that are carried out and controlled by agreed rules that aim to support the growth and development of players and gain learning experiences (Nurhayati & Zarkasih Putro, 2021; Wijayanti, 2018). As a miniature of life, the game shows various attitudes of children in socializing, both directly and through barriers (Bakhtiar, 2018; Lacksana, 2017). When children play games, it is not only a fun activity but children can grow and learn through the development of ideas related to the world of children (Doron, 2017; Pramono, Nurhasanb, et al., 2019). Games can involve children's physical and mental, by playing games children can move actively so that they can release tension in the body and neutralize negative emotions in the body because they can create feelings of pleasure. A game played by children should pay attention to criteria such as a) easy to use by children, b) in accordance with the characteristics of the child's development and growth, c) has utility value, d) creates children's interest in playing it, e) easy and cheap in creating games (Agustia, 2023; Laili et al., 2017).

One type of game that can be played by children is the hula hoop game. Hula hoop is an object made of plastic or rattan in the shape of a circle that is used to do various body movements (Azizah & Dheasari, 2023; Novitasari et al., 2019). This game is included in the type of traditional games that can be used by children of early age and adults. In general, the hula hoop game is played by spinning it on the waist area, but it can be modified how to play it such as jumping or throwing it can be played individually or in groups with friends. One of these fun games has benefits because the movements made can stimulate the body's muscles so that they produce muscle contractions in body movements. Then it has an effect on the child's body motor skills which include speed, agility, strength, endurance and flexibility (Nenggar et al., 2024; Ujang, 2019).

In fact, early childhood children do a lot of active moving activities, but currently the frequency of active moving game activities tends to decrease because children feel more comfortable staying still while using gadgets to play games or watch videos. According to the Central Statistics Agency report in 2023, the use of gadgets in the 5-6 year old age range in 2022 reached 52.76%. Based on data from the Indonesian Child Protection Commission in 2023, it stated that the average time children use gadgets is 6 hours 45

minutes for watching videos, using social media and playing games. According to other data, 34.8% use gadgets for 2-5 hours and 25.4% use more than 5 hours (Estiningtiyas et al., 2024; Kalsum & Purwanto, 2023). In fact, the limit for gadget use for children aged 3-5 years is 1 hour per day, while for children aged 6-8 years it is 2 hours per day (Firmawati et al., 2023; Purwanti et al., 2023)**.** When compared to previous data, the average frequency of gadget use for children is too high. High gadget use will affect the growth and development process of children. Lack of physical activity reduces children's agility (Herdayanti & Watini, 2021; Pranata & Sarwita, 2019).

Based on the results of observations and initial interviews conducted with group B teachers regarding the stimulation of agility abilities of children aged 5-6 years in three institutions, namely Maulayya Islamic Kindergarten, Kemala Bhayangkari 11 Kindergarten, and PGRI 3 Tumpang Kindergarten, the agility stimulation activities carried out were dancing, gymnastics, flag relay or playing activities using a bridge board, carpet puzzles, or small chairs. These activities have been carried out often so that children are lazy and less interested in participating in activities. Physical games that are often played are free play in the school area such as using swings, spinning balls, compound stairs, seesaws and slides. Children feel less interested in moving actively, for example during morning exercise children do activities weakly, some are even busy talking to friends, playing alone and some do not move. Often children feel bored with activities so that new activity innovations need to be carried out. During observations at Maulayya Islamic Kindergarten during the zigzag jump activity, 9 out of 15 children went outside the specified line. When changing the direction of body movement, children still find it difficult. In TK PGRI 3 Tumpang, 4 out of 9 children were found to be weak in their movements during hopscotch activities. In addition, 5 out of 9 children stepped on the boundary line provided. Then in TK Kemala Bhayangkari 11, 16 out of 23 children were found to have difficulty moving quickly during jumping and running activities, and they hit blocks that they should have jumped over. From these problems, researchers were encouraged to stimulate the agility element in children. Stimulating game activities with agility aspects helps children to move actively and in a controlled manner (Rahmadini et al., 2022; A. Yulianti, 2020). Children become enthusiastic and do not experience difficulties when changing movements quickly and by providing agility stimulation, children's motor skills will be trained. To overcome the problems that occur, researchers are interested in developing a hula hoop leg game.

The study entitled "Improving Children's Gross Motor Skills Through Playing with Hulahoop Media in Group B Children at Pagar Merbau Kindergarten in the 2021-2022 Academic Year" shows that the hula hoop game can increase children's active movement and motivate children to participate in the game in a fun way. In cycle I, the percentage was 67.75%, then there was an increase in cycle II, getting a percentage of 88.33%. Similar research was also conducted regarding the hula hoop game which obtained the results that the hula hoop game can stimulate aspects of agility and balance in group B children. Cycle I obtained a percentage of 72% which fell into the incomplete criteria, then in cycle II, it obtained a percentage of 86% which fell into the complete category. So that the hula hoop game can be used as one of the games to be an alternative learning, one of which is related to agility (Novitasari et al., 2019; Yuliani et al., 2021). So that the development of hula hoop games can be used to stimulate agility.

Hulahop kaki is a game using a circular hula hoop made of rattan accompanied by a ball connected by a rope played by jumping and hopping. Hulahop kaki is different from hula hoops in general which are only circular with plastic or rattan material but hula hoop kaki besides having a circle is equipped with a rubber ball connected by a rope. In addition, there is also a difference in how to play it, the hula hoop kaki game is played by jumping and hopping and can be used individually or in pairs. The development of the hula hoop kaki game is adjusted to the characteristics of the child so that this game can be used as an innovation to stimulate agility in children aged 5-6 years. Therefore, researchers are interested in taking the research title "Development of the Hulahop Kaki Game as a Stimulation of Agility in Children Aged 5-6 Years". The development of the hula hoop kaki game aims to produce a hula hoop kaki game product that is suitable for use as a stimulation of agility in children aged 5-6 years.

2. METHOD

The method used in this research is Research and Development (RnD). Research and development are steps in developing a new product or improving an existing product and can be accounted for (Supratiknya, 2015) (Helwig et al., 2018). This study used the Borg & Gall model modified by Sugiyono which consists of 10 steps. The stages carried out are: 1) potential and problems; (2) data collection; (3) product design; (4) product design validation; (5) product design revision; (6) small group trials; (7) revision of small group trial results; (8) large group trials; (9) final product refinement. The 10th stage is mass production; this stage was not carried out because the product developed only produced a prototype of a hula hoop game used in small and large group trials and time and cost limitations. The research and development procedures carried out are not standard, according to Ardhana each researcher can choose

and determine which steps are most appropriate to be carried out in their research based on considerations of the conditions in the development process (Achsan & Inten, 2024). The study was conducted in three kindergarten institutions, namely Maulayya Islamic Kindergarten, Kemala Bhayangkari 11 Kindergarten, and PGRI 3 Tumpang Kindergarten. The types of data obtained were quantitative and qualitative data. Quantitative data came from calculating the total score of the questionnaire sheet using a Likert scale with a scale of 1-5 filled in by validation experts and users (teachers) during small and large group trials. While qualitative data came from suggestions and input from validation experts, results of initial interviews with teachers and notes on observation results.

Then the percentage results obtained are grouped according to the table criteria in Table 1 (Akbar, 2013). The hula hoop leg game is declared feasible if it reaches a minimum percentage value of 61.00%.

Table 1. The Eligibility Criteria

Percentage	Qualification	Information
81.00% - 100.00%	Very Worth It	Very good to use without revision
61.00% - 80.00%	Worthy	Can be used with minor revisions
41.00% - 60.00%	Quite Decent	It is recommended not to use due to major revisions.
21.00% - 40.00%	Not feasible	Not to be used
00.00% - 20.00%	Totally Unworthy	Absolutely not allowed to use

The product validity test was conducted by early childhood game experts conducted by 1 lecturer of PGPAUD State University of Malang and also 1 teacher of RA Perwanida 3 and material experts conducted by 1 lecturer of the Faculty of Sports Science, State University of Malang and 1 teacher of RA Insan Kamil. The small group trial was conducted by 6 children from Kemala Bhayangkari 11 Kindergarten. Meanwhile, the large group trial was attended by 15 children at Maulayya Islamic Kindergarten, 9 children at PGRI 3 Tumpang Kindergarten, and 17 children at Kemala Bhayangkari 11 Kindergarten which was attended by children aged 5-6 years, namely group B.

3. RESULT AND DISCUSSION

Result

The hula hoop leg game product is designed to adapt to the problems that occur and to achieve the goals that have been made. The hula hoop leg is made of rattan with a diameter of 15 cm, a bell rubber ball with a diameter of 6 cm and a weight of 55 grams in various colors and a blue plastic rope. As a protector, the hula hoop leg is covered with light blue foam to provide comfort for children. Figure 1 is a picture of the initial design of the hula hoop leg.

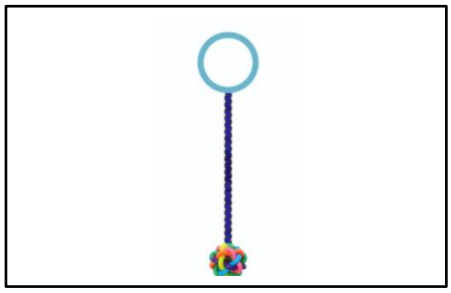

Figure 1. The Initial Design of the Foot Hula Hoop

The game is played in 4 stages, namely stage one is done individually, the hula hoop is inserted into one foot then the ball is thrown to the side. The other foot is tasked with avoiding the moving ball by jumping. Stage two is done in pairs, child 1 is tasked with jumping while child 2 is tasked with moving the hula hoop to the left and right or vice versa. Child 1 jumps at one point, when the ball starts to approach the foot then jumps to avoid the ball. Stage three is done in pairs but the difference is that the children jump to the left and right alternately. Stage four is also done in pairs by jumping at one point but the ball is moved in a circular manner. When the game is played in pairs, children can switch positions when the time provided has run out.

The next stage is validation of the product design carried out by experts before the trial stage. Validation experts in this study consisted of early childhood game experts and material experts. In the validation expert assessment using a questionnaire using a Likert scale of 1-5. Based on the results of the

validation of early childhood game experts conducted by 1 lecturer of PGPAUD, State University of Malang and 1 teacher of RA Perwanida 3, a score of 101 was achieved from a total maximum score of 110. If calculated as a percentage, the results of the early childhood game validation expert, namely 91.81%, are included in the very feasible category but there are minor revisions. Early childhood game experts also provided comments and suggestions, namely: 1) The games developed are interesting and can stimulate agility, balance and focus; 2) require repeated practice so that the child's foot and eye coordination skills are good; 3) the research conducted is good, namely regarding the agility of children aged 5-6 years; 4) the rope part is replaced with a more flexible material.

The next validation expert was carried out by a material expert who was 1 lecturer from the Faculty of Sports Science, State University of Malang and 1 teacher from RA Insan Kamil. The results obtained were a score of 56 out of a maximum total score of 60. If calculated as a percentage, the results of the validation expert reached 93.33%, including the very feasible category so that it is very good to use without revision. The material validation expert only provided suggestions and comments in the form of it being feasible to continue the trial stage without revising the product. So, based on the results of the validation of early childhood game experts and material experts, the results were very feasible so that it could be continued to the next process, namely small group trials.

Before conducting the small group trial stage, the researcher first revised the hula hoop leg game product based on the suggestions and comments of early childhood game experts. Initially, the rope section used plastic rope replaced with a more flexible material, namely using synthetic rubber rope. After completing the revision of the rope section, it can be continued to the next stage, namely the small group trial. Table 2 is a picture of the revised rope section.

Table 2. The Product Revisions Based on Expert Input

Before Revision	After Revision
	

The small group trial was conducted by 6 children at Kemala Bhayangkari Kindergarten 11 Tumpang aged 5-6 years, namely group B. At this stage, observations were made and questionnaires were filled out by the user (teacher). There are 5 indicators on the observation sheet. Table 3 are the results of observations in the small group trial.

Table 3. The Results of Small Group Trial Observations

Indicator	Number of Subjects Achieving Indicators	Total Number of Subjects
The child is able to jump without being hit by the ball.	6	6
The child is able to jump without being hit by the ball	5	6
Children are able to move from place to place without falling.	6	6
Children are able to change direction quickly and accurately	6	6
Children are able to coordinate body movements to stabilize the movement of the ball.	5	6

The implementation of the small group trial, the researcher observed the activities as an observer and helped children who had difficulties. In general, children felt interested and enthusiastic when playing the foot hula hoop game and children were found fighting when using the foot hula hoop. One child was found who needed direction when jumping the ball, the child jumped too slowly so that it was difficult to stabilize the movement of the ball. In stage 2, namely the jumping movement at one point, there was one child whose foot was hit by the ball. After finishing the foot hula hoop game, the teacher filled out the questionnaire that had been given. Based on the results of the questionnaire answers, a score of 71 was achieved from a total maximum score of 75. Then it was calculated into a percentage form reaching 94.66%, which is included in the very feasible category. However, at this stage there was a small revision made,

namely regarding the length of the rope. Initially, the length of the rope used was 30 cm, then changed to 40 cm. After revising the rope section, it was continued with the large group test stage. Table 4 is a comparison of the rope before and after the revision.

Table 4. The Product Revisions After Small Group Trials

Picture	Information
	Comparison of rope length before and after revision. The left side of the rope is 40 cm long (after revision) while the right side of the rope is 30 cm long (before revision).

Large group trials were conducted at 3 kindergarten institutions, namely Maulayya Islamic Kindergarten with 15 children, PGRI 3 Tumpang Kindergarten with 9 children and Kemala Bhayangkari 11 Kindergarten with 17 children aged 5-6 years group B. At this stage, observations and questionnaires were also carried out. Table 5 are the results of observations in the large group trial.

Table 5. The Results of Large Group Trial Observations

Indicator	Number of Subjects Achieving Indicators	Total Number of Subjects
The child is able to jump without being hit by the ball.	32	41
The child is able to jump without being hit by the ball	35	41
Children are able to move from place to place without falling.	40	41
Children are able to change direction quickly and accurately	37	41
Children are able to coordinate body movements to stabilize the movement of the ball.	34	41

When the large group trial, in general the children were able to follow the foot hula hoop game well and enthusiastically. However, it was found that children had already made jumping movements but the ball was still far from moving towards their feet, then the researcher gave an example to the children how to jump according to the movement of the ball, namely when the ball started to approach the feet. In stage 2 there were three children who jumped and were hit by the ball, in stage 3 there were four children who jumped and were hit by the ball and there was one child who fell because when landing his feet were too bent in stage 3. Furthermore, filling out the questionnaire sheet carried out by the user (teacher) obtained a score of 214 from a total maximum score of 225, then calculated into a percentage form reaching 95.11% included in the very feasible category so that the foot hula hoop game is feasible to be used as agility stimulation for children aged 5-6 years. No revisions were made to the large group trial. After going through a series of stages of making game products that have been validated by experts and also carried out small group and large group trial stages, the final result of the hula hoop leg game product is a hula hoop leg made of rattan with a diameter of 15 cm and coated with light blue foam, the rope part is made of colorful synthetic rubber with a length of 40 cm with a rope diameter of 6 mm and the ball part is made of colorful bell rubber weighing 55 grams and a ball diameter of 6 cm.

Discussion

Based on the data obtained from the hula hoop leg gamefalls into the very feasible category so that it can be used as agility stimulation for children aged 5-6 years. Games are fun activities that provide meaningful experiences for children as a supporter of their development process. Activities carried out in games provide benefits to the body such as increasing physical abilities, strengthening muscles, helping affective and cognitive development and increasing self-confidence in children (Pramono, Sutama, et al., 2019)**.** The game development that is developed must at least have criteria such as attractiveness, security and ease of use (Achsan & Inten, 2024). The attraction comes from the many colors found on the foot hula hoop, namely the ball and rope parts, when the ball moves it can produce sound because there is a bell in it and the variety of ways to play is that it can be used individually or in pairs. The safety aspect is by coating the part of the hula hoop made of rattan with blue foam which aims to prevent pain when friction occurs

between the hula hoop and the feet, then the ball used is a hollow ball so it doesn't hurt if it hits the feet rather than using a solid ball. How to play the foot hula hoop is easy to do, namely the child jumps and jumps to avoid the movement of the ball.

The foot hula hoop game also went through a revision stage based on suggestions and comments from experts and users (teachers). The revision stage was carried out by replacing the rope material used, initially the rope used was a plastic rope then replaced using a synthetic rubber rope. During the trial, the game was carried out in 4 stages, namely stage one was carried out individually, the hula hoop was inserted into one foot then the ball was thrown to the side. The other foot was tasked with avoiding the moving ball by jumping. Stage two was carried out in pairs, child 1 was tasked with jumping while child 2 was tasked with moving the foot hula hoop to the left and right or vice versa. Child 1 jumped at one point, when the ball started to approach the foot then jumped to avoid the ball. Stage three was carried out in pairs but the difference was that the children jumped to the left and right alternately. Stage four was also carried out in pairs by jumping at one point but the ball was moved in a circular manner. When the game was played in pairs, children could exchange positions when the time provided had run out.

The hula hoop leg game stimulates children to move quickly by jumping and hopping so as not to be hit by the ball. Jumping and hopping activities in a game can improve children's agility (EN Yulianti & Fithroni, 2019). When jumping activities require good coordination by adjusting body movements when jumping so that the movement of the ball can occur stably. Coordination between the eyes and feet is also needed so as not to be hit by the ball when jumping. Likewise, when the game is played in pairs, children need to jump quickly so they can avoid the movement of the ball. Balance skills are also needed so that children do not fall when playing. In stage three, children jump to the left and right alternately, when doing this activity includes moving activities by changing the direction of the body to the left and right as one of the activities in stimulating agility. The ability to change the body when moving places which is done quickly and accurately is a form of agility (Gallahue et al., 2011).

In the small group and large group trial stages, children were interested in joining the foot hula hoop game because they felt like they were new to playing this game. Children were so enthusiastic when they saw the foot hula hoop when the researcher started introducing the product. There were even children who fought over it because they couldn't wait to play it. The foot hula hoop game is an innovation in children's play activities, especially in stimulating children's agility. This innovation comes from the modification of the shape of the hula hoop tool which is different from the hula hoop in general that is often encountered by children. Based on the results of the questionnaire sheets that have been filled out by experts, namely early childhood game experts and material experts and users (teachers) who were filled in during the small and large group trial periods, the results of the development of the foot hula hoop game are very suitable for use as agility stimulation for children aged 5-6 years.

4. CONCLUSION

The foot hula hoop game in this study has been tested by early childhood game experts and material experts with the acquisition of a very feasible category. In the small and large group trials also obtained a very feasible category so that the foot hula hoop game can be used as agility stimulation in children aged 5-6 years. Based on this, it can be concluded that the foot hula hoop game is very feasible to be used as agility stimulation in children aged 5-6 years.

5. ACKNOWLEDGE

The researcher would like to thank Kemala Bhayangkari 11 Kindergarten, Maulayya Islamic Kindergarten and PGRI 3 Tumpang Kindergarten who have helped in the data collection process in this study. Thank you to the first and second supervisors who have guided during the work who have been willing to take the time and both parents and friends who gave support, motivation and also prayers to the researcher so that this research can be completed.

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