



## Creating a circuit training model to improve the agility of seven-year-olds

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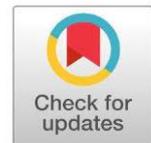
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**Abstract:** The objective of this study is to create an efficient circuit training model for 7-year-old kids. Research and development from Borg and Gall are the research methods used. There are 24 variations as a result of this research and development. Four training posts were developed by researchers, each of which tries to train one or two aspects of physical fitness. Strength, Endurance, Muscular Power, Speed, Flexibility, Agility, Coordination, and Balance are the 10 elements of physical fitness. Following a review of the literature on the characteristics of children aged 7 years, the researchers only created 4 posts, each of which may train one to two physical fitness components. On elementary school pupils in grade 1, this circuit training model's development and research were tested. The test results can be correctly implemented. Following the phases of study and development, it has been determined that this model can be used in schools.

**Keywords:** development; circuit training; agility.

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### INTRODUCTION

Particularly for kids who have specific hobbies or special aptitude in sports, maintaining a good physical state should start early. This is because the body's performance will be significantly impacted by the physical component. The stimulation of learning by physical activity has a positive effect on cognitive function. Physical activity is positively correlated with IQ, verbal, memory, and numeracy skills as well as perceptual ability.

Cardiovascular endurance, muscular endurance, balance, flexibility, speed, stamina, agility, muscle explosiveness, coordination, and accuracy are some of the physical requirements that must be met (Yuliandra et al., 2020). The development of a child's motor skills must begin at a young age, with infants being taught to hold and lift items, raise their arms and legs, and other tasks. When children reach school age, which is between the ages of 6 and 13, their development is most significant and progressive since at that point they start to explore a lot of their play environment and the outside world, including school. Children learn by playing during playgroups and PAUD, as can be shown. When a child is 7 years old, they are growing, learning, and developing. This age is also known as the active era, when kids are actively exploring the environment. Children at this age are curious and actively engage in unfamiliar activities in order to learn through hands-on experience.



Health and exercise Physical education classes are among the most popular courses among students since they take place outdoors of a traditional classroom setting or on a playing field, allowing students to play and exercise while also learning and developing new skills. However, if a teacher does not offer physical education lectures well, what happens is that students become bored, and because of boredom, the material cannot be channelled effectively. Educators who comprehend the evolution of education and the curriculum's materials are said to provide excellent education, according to the adage "Quality education is also produced by quality teachers".

National education aims to develop students' potential to become human beings who believe in and fear God Almighty, have a noble character, are healthy, knowledgeable, capable, creative, be independent, and become a democratic and responsible citizen. National education serves to develop capabilities and shape dignified national behaviour and civilization (article 3 of Law Number 20 of 2003) (Pratiwi & Kristanto, 2015). Physical education is an essential component of education, thus this researcher, who plans to teach in the future, is interested in developing creative teaching or play materials to develop the motor skills of 7-year-old kids that can be used in and outside of the classroom.

Children's first need is to play. Children can be creative and energetic through play, which will help their development progress. All youngsters should enjoy and benefit from their education. Playing games or learning while playing can both include learning. Playing is a learning activity that doesn't require an end goal but is a fulfilling process that can promote kid development success (Baiti, 2020).

One kind of game that can be created to improve kids' motor abilities is a circuit game. The circuit game is made up of a number of activity posts, and each post contains a game that helps develop kids' motor abilities. Each activity or post advances activities that include components of activities that are modified to the degree of development success. Circuit games will accelerate children's motor development because those activities are the focus of each article. Due to the interdependence of each component of development, other aspects are indirectly promoted as well. Additionally, this circuit will encourage the child's mindset to become more patterned and directed. It is best to play this circuit game outside. Children can have their motor skills developed without exerting too much effort through this circuit game (Paramitha & Supiati, 2020).

The ability to shift course while retaining speed and managing the direction and position of one's body is known as agility. Individual or group games can be played using this circuit training methodology that is focused on games (relay at each post). Cooperative learning includes team games, which can enhance a variety of abilities, including motivation to acquire motor skills, learning outcomes, learning attitudes, and critical thinking, social, creative, and problem-solving abilities. In addition, team games allow students to demonstrate their skills to the utmost and put in a lot of effort to win, according to studies, making them a memorable training model. Consequently, the circuit model may be the best way to improve learning results

and student motivation in PJOK disciplines (Luo et al., 2020). From here, the author hopes to modify the game's circuit design into an exercise that will improve the agility of 7-year-old kids.

### METHOD

The goal of the research was to identify and create a useful circuit model product. The process of creating involves making an effort to extract originality from previously created inventions that have been modified to meet the demands, goals, and tools of a time that is simultaneously testing the veracity of information (Riyanto & Hatmawan, 2020). The researcher decided to apply Borg and Gall's research steps in the development procedure for this study. 20 to 40 kids 7 years old will be used as research participants by the researchers. Researchers employ Borg & Gall's Research and Development stages, which are listed below, to make research simple, systematic, and routinely carried out.

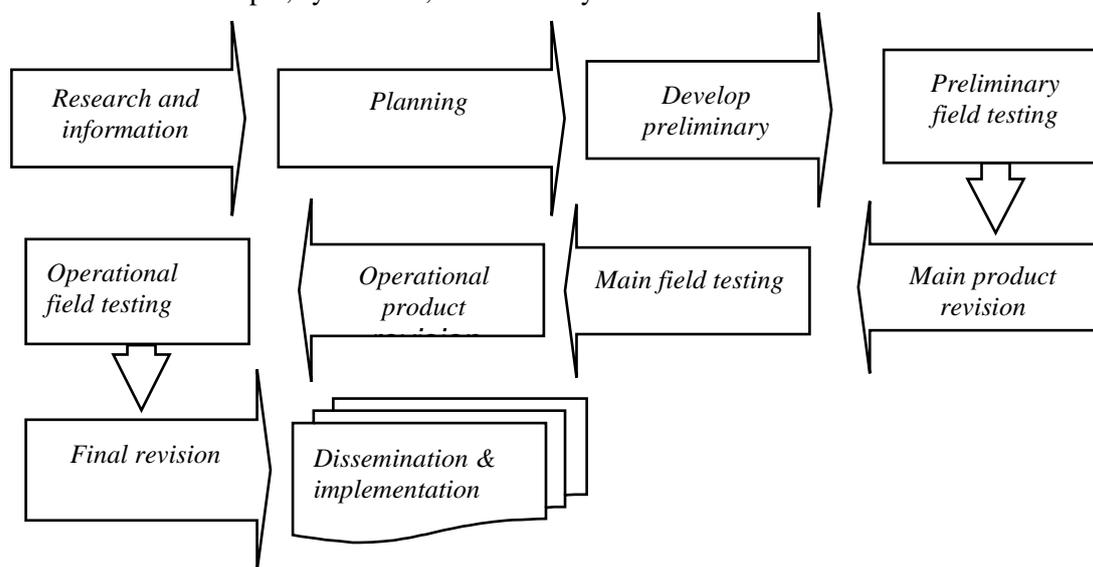


Figure 1. Stages of Research and Development research by Borg & Gall

Research and data collecting are the first steps in the process, which start with an examination of the issues and requirements for training models for 7-year-old children. So that students or youngsters are not bored and joyful while engaging in the learning or practise process, modifications are done to generate fresh varieties of educational materials. Since the sources and training media used have a significant impact on students' development, an analysis of the most frequently used learning resources and training media by elementary school physical education, sports, and health subject teachers for grade 1 elementary school students is also necessary at this stage. The researcher will create product designs that are simple to grasp and adaptable to changing situations and needs if the learning medium is insufficient.

In the second stage, activity concepts were created that were organised in training models or modified training models that were established in response to the needs of children between the ages of 7 and 12. If you employ different versions, you will still attain the same aims and outcomes since modifications are made while still keeping in mind the learning objectives. The researchers developed a circuit training model to train the motor skills of children aged 7 as a means of learning and teaching at school or as a way of playing

children at home after assessing the issues and needs of students. The researchers created a number of game circuits during the planning stage, each with four posts.

The initial product's preparation is the third stage. Currently, the researcher has created a product design that includes information about the product's benefits, functions, and implementation guidelines. The first step in creating an initial product that will be tested in a small field is initial product preparation. Initial product concepts are tested in short field tests on delicate subjects. In a modest field trial, 10 elementary school pupils in the first grade or 7-year-old children will be invited to play and practise their motor skills using this training paradigm. While 30 kids in all participated in the large group trial. These phases are helpful in determining whether the circuit model's configuration can affect the agility of 7-year-old children.

## RESULTS AND DISCUSSION

A 7-year-old child is the topic of this study and development, which includes multiple gaming posts. Students are required to finish the prepared activities in each post. Additionally, there are numerous types of circuits in this circuit training system so that every student or youngster can face unique difficulties while working toward the same objective. Four training stations will be developed by researchers, each of which will train one or more aspects of physical fitness. There are 10 components of physical fitness, namely Strength, Endurance, Muscular Power, Speed, Flexibility, Agility, Coordination, and Balance.

4 posts for making circuit models, 1 post can be used to train some of these components of physical fitness. Like the example below:

1. Circuit 1 has several posts including:
  - a) Balance training: walking on a 10-meter block,
  - b) Explosive power and ankle strength training: playing the traditional game of airplane crank,
  - c) Accuracy training: throwing the ball into the basket with a distance of 4 meters for 30 seconds,
  - d) Muscle endurance training: creeping 8-meter winding track,
  - e) Flexibility exercise: walking backward over the bar at the subject's average chest level,
  - f) Speed, agility and cardiovascular training: shuttle run moving the hoop in the mat and returning it to all forms.
2. Circuit 2 has several posts including:
  - a) Balance exercises: standing by lifting one leg for 10 seconds,
  - b) Explosive power and ankle strength exercises: going up and down stairs two feet for 30 seconds,
  - c) Accuracy exercises: reaction to touching an object 5 times,
  - d) Muscle endurance exercises: lunge position during 10 seconds,
  - e) Flexibility exercises: sitting in an upright body position, legs straight ahead and hands trying to touch the feet for a count of 2 x 8,
  - f) Speed, agility and cardiovascular exercises: zig-zag running 5 Kun then back
3. Circuit 3 has several posts including:
  - a) Balance training: airplane attitude for 10 seconds,
  - b) Explosive power and ankle strength training: jump right-left with a distance of 20-30 cm for 30 seconds,
  - c) Accuracy training: kick the ball into the goal 5 times,
  - d) Muscle endurance training: playing depending on "monkey bar for kids",
  - e) Flexibility

exercises: kiss the knees while sitting with a count of 2x8, f) Speed, agility and cardiovascular exercises: run to form the number 8 3 times.

a) Circuit 4 has several posts including:

a) Balance training: playing the trampoline for 30 seconds, b) Explosive power and ankle strength training: plyometric left foot 5 times and right foot 5 times, c) Accuracy training: throwing arrows at the target 5 times, d) Muscle endurance training: playing climbing spider webs up and down, e) Flexibility exercises: kiss the knees for 10 seconds while standing, f) Speed, agility and cardiovascular exercises: use shadow badminton with a running axis in the middle and utilize 3 shuttlecocks to be moved to the right, left and back then put it back to the front.

Small and large group trials which aim to determine the feasibility of the product and find out the advantages and disadvantages that need to be improved. Researchers have high hopes for this training method so that it can have a visible impact on the motor development of children aged 7 years. Therefore choosing 10 components of physical fitness as a measure of the value of motor training. The results of the small test and large test can be described in table 1 below:

Table 1. Description of The Results of Small Group Trials and Large Group Trials

No	Model	Small & Large Test	No	Model	Small & Large Test
1	SG 1 Variation 1	Worthy	13	SG 3 Variation 1	Worthy
2	SG 1 Variation 2	Worthy	14	SG 3 Variation 2	Worthy
3	SG 1 Variation 3	Worthy	15	SG 3 Variation 3	Worthy
4	SG 1 Variation 4	Worthy	16	SG 3 Variation 4	Worthy
5	SG 1 Variation 5	Worthy	17	SG 3 Variation 5	Worthy
6	SG 1 Variation 6	Worthy	18	SG 3 Variation 6	Worthy
7	SG 2 Variation 1	Worthy	19	SG 4 Variation 1	Worthy
8	SG 2 Variation 2	Worthy	20	SG 4 Variation 2	Worthy
9	SG 2 Variation 3	Worthy	21	SG 4 Variation 3	Worthy
10	SG 2 Variation 4	Worthy	22	SG 4 Variation 4	Worthy
11	SG 2 Variation 5	Worthy	23	SG 4 Variation 5	Worthy
12	SG 2 Variation 6	Worthy	24	SG 4 Variation 6	Worthy

The results above show that the small test and large tests can be carried out properly so that the product can be said to be feasible. After carrying out the large test the researcher carried out the 8th step, namely the effectiveness test. This test uses The One-Shot case Study, which means that there is only one group that is given treatment and then given a post-test. Design of the study this use the One-Shot case Study. As the design could see on a table under this:

Table 2. Design Study

Subject	Treatment	Test
1 Group	X	Q

Information:

X : Treatment

Q : Tests after given (Treatments)

The motor ability test is only taken for balance. The test norms took from Arnheim and Sinclair. The steps are as follows: Kun is placed 1.5 meters by forming a straight line. On the "yes" signal, the children must run as fast as they can in a zig-zag pattern around the cone that the child has passed for 20 seconds. For running over a cone-shaped obstacle course and back again, the child receives 8 points.

Table 3. Agility Test Values

Name	Agility Run	Name	Agility Run
1	21	13	27
2	22	14	28
3	22	15	28
4	19	16	28
5	32	17	30
6	32	18	33
7	28	19	32
8	28	20	32
9	29	Amount	559
10	30	Average	28
11	28	Max Value	32
12	30	Min Value	19

The results of the agility test can be seen in table 3 above. There are 20 children involved. The maximum value is 32. The minimum value is 19 and the average is 28. The data in figure 3 of the *agility run graph* can be seen below (Figure 2).

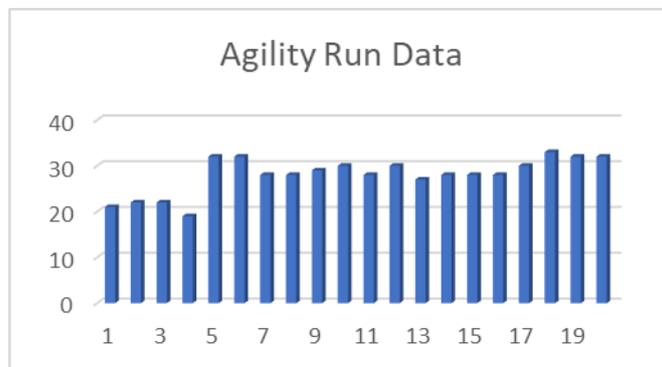


Figure 2. Agility Run Graph

The final test data acquisition can be seen in detail once the test has been run using SPSS. The significance level (p) 0.05 is shown by the data sign (2-tailed) value of 0.00. The results after applying a circuit training model demonstrate a good level of relevance, it may be said. Table 4 displays the outcomes of the calculations made using the full version of SPSS.

Table 5. One-Sample Statistics

	N	Means	Std. Deviation	std. Error Means
Agility Run	20	27.9500	4.00625	.89582

Table 6. One Sample Test Result

Test Value = 20						
	t	df	Sig. (2-tailed)	Mean Differences	95% Confidence Interval of the Difference	
					Lower	Upper
Agility Run	8,875	19	.000	7.95000	6.0750	9.8250

Based on the table above, detailed data can be seen. Obtained final test data, then the data using SPSS is shown in the table. This shows that the significance level is  $(p) < 0.05$ . So, it can be concluded that the results after being given a circuit training model show a significant increase.

After getting the results of the next research to the discussion stage. The results of this study indicate that the significance level is  $(p) < 0.05$ . So, the results of the study showed a significant increase. This is in line with the results of research from [Sonchans et al. \(2017\)](#) that circuit training programs increase muscle strength, agility, and cardiovascular endurance ([Sonchan et al., 2017](#)). So that the study of the research can be used as a guide to improve physical fitness.

Meanwhile, the results of research from Malar & Maniazhagu showed that agility performance increased significantly during six weeks of training. period for circuit training combined with agility speed training and circuit training combined with jumping rope training ([Malar & Maniazhagu, 2022](#)). The results of the study from Raj & Maniazhagu showed that upper body muscle endurance performance increased significantly during the six-week training period for circuit training combined with speed agility quickens and circuit training combined with jump rope exercises ([Raj & Maniazhagu, 2022](#)). The two selected exercise interventions, namely circuit training combined with speed agility quickens exercises and circuit training combined with jump rope exercises, produced the same effect on muscle endurance in the upper body run ([Jadhav, 2020](#); [Mitra et al., 2016](#)).

## CONCLUSION

On elementary school pupils in grade 1, this circuit training model's development and research were tested. The test results can be used effectively. Significant findings from the efficacy test indicate that this strategy can be used in classrooms. Researchers have suggested that a control group is required for evaluating effectiveness in order to see how the outcomes differ.

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