



VALIDITY FOREHAND AND BACKHAND TABLE TENNIS INSTRUMENT FOR EARLY CHILDREN (6-8) YEARS

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Abstract. The research entitled "Table Tennis Game Model for Early Childhood (6-8) Years" aims to produce a table tennis game model and improve table tennis playing skills, especially basic forehand and backhand techniques. The research method used is research & development (R&D). The research and development method is carried out through ten (10) stages, starting from potentials and problems, next data collections, product design and next design validation, after that product design validation is carried out, then design revisions are carried out, product trials, then product revisions and next final products are carried out. the subjects of this research are early childhood aged 6-8 years. This research is compiled based on the Master Design of Research of the State University of Jakarta with the Field of Science, Technology and Sports. Based on the results obtained from this study, forehand and backhand table tennis in early childhood 6-8 years old testing was carried out with 30 samples with an average forehand of 34.5 and an average for backhand of 31.1. Based on reliability testing with Cronbach alpha, a value of $0.188 > 0.7$ was obtained, thus representing that the items were reliable for measuring the sample.

Keywords: Table Tennis, Games, Early Childhood

1. INTRODUCTION

Facing the development of the times, the development of science and the development of current technology, development in the education sector is an important tool to improve the value and quality of human resources. Therefore, the field of education must receive the main priority and handling by the government, education managers and the community. Efforts to improve the quality of education are an integrated part of efforts to improve the quality of human resources, both in terms of ability, personality and responsibility as citizens. This

has created an incentive for the government to always try to improve and perfect the quality of education at every level of education.

Community activities today cannot be separated from sports, both as an arena for achieving achievements and as a need to keep the body healthy. Sports can be a solution for human resources in developing their quality of life, which aims to form values, such as character, personality values, discipline values, sportsmanship values and can improve the achievements of human resources, thus having an impact on increasing the value of nationalism.

Ateng in [1] said that sports come from two syllables, namely olah and raga, which mean cooking or manipulating the body with the aim of making the body mature. Cholik Mutohir in [2] stated that Sport is a systematic process, namely everything that encourages, develops and fosters a person's physical and spiritual potential in the form of games, competitions and intensive physical activities in order to obtain recreation, victory and peak achievement to create a complete Indonesian human being, with quality based on Pancasila.. Another opinion expressed by Kemal and Supandi in [1] is that sport is essentially "a large muscle activity that uses certain energy to improve the quality of life". [3] there are many sports that are popular and can be played by children, teenagers to adults, one of which is table tennis. Table tennis is a sport that is quite popular with all levels of society and can be played by everyone, from children, teenagers to adults. This is in line with what was conveyed by [4], that "table tennis is a sport that knows no age limits, children and adults can play together". "Table tennis is a small ball game played on a table, the ball is hit with a racket called a bat, table tennis is played by two or four people" [5].

Table tennis has many benefits for everyone who plays it. The benefits of playing table tennis are 1) improving body reflexes, 2) preventing dementia, 3) helping to lose weight, 4) increasing bone density, 5) increasing stamina, 6) sharpening brain function, 7) developing mental acuity and 8) a means of socializing. This is what makes table tennis popular with everyone, because the benefits of playing table tennis affect other daily activities. A healthy and fit body condition can stimulate students to be more optimal in carrying out other activities related to movement, increasingly positive brain development, making them more confident and increasing readiness to follow the learning process. As conveyed by Syarifuddin (2016) "a fit body can carry out any activity related to motion by involving the

body's limbs, stimulating it to have good motion, then the development of brain intelligence has a positive impact and students are stimulated to have self-confidence". This means "a fit body can carry out all activities related to motion by involving the body's limbs, stimulating it to have good motion, then the development of brain intelligence has a positive impact and students are stimulated to have self-confidence". In reality, table tennis is still foreign to children and only in certain areas are children actively playing table tennis, this is influenced by technological advances that are increasingly developing and have an impact on changes in people's behavior, namely reduced movement activity. According to [6] The development of information technology in human life has a significant impact on changing values in society. As a result, the entire community can easily access various information, both positive and negative.

Thus, this gradually begins to change the way of thinking and lifestyle of society, both consciously and unconsciously. The development of games also greatly influences children and what is currently popular with children is online games. In addition to online games, children are also more interested in technology than physical activities. This is also due to the lack of promotion of physical activities such as sports to the world of technology. "Technology considered being a big part of people's daily lives; it is important and vital that children learn how to use it at an early age" [7], which means that technology is considered part of everyday life and requires children to learn to use technology from an early age. Based on this fact, the researcher will create a table tennis game model for early childhood aged 6-8 years. The table tennis game model will be adjusted to the character and needs of early childhood, so that children will be motivated and interested in playing table tennis. Therefore, the researcher will conduct a study entitled "Table Tennis Game Model for Early Childhood Aged 6-8 Years.

The research to be conducted is entitled "Table Tennis Game Model for Early Childhood 6-8 Years. This research certainly has some novelties, to obtain these novelties, it is necessary to conduct a study through the state of the art, the aim is to reveal and find previous research as a basis for conducting subsequent research. The state of the art in this study is as follows:

Table 1. State of the Art

No	Journal	Researcher	Conclusion
1	[8]	Procedia-Social and Behavioral Sciences.	The purpose of the research that has been conducted is to determine the effect of film-based learning on learning table tennis playing techniques.
2	[9]	The Swedish Journal of Scientific Research.	The aim of this research is: <ol style="list-style-type: none"> 1. Analyze the influence of images in the form of animation, using rhythmic music or not using music rhythm, between pre and post-test on learning table tennis forehand and backhand techniques in table tennis games. 2. Identifying the differences between the study groups after the measurement, which aims to determine whether the educational method is the best in learning the skills of table tennis forehand and backhand stroke techniques.
3	[10]	Physical Education, Health and Recreation.	The theories that support SAVI learning are Accelerated Learning, right/left brain theory; triune brain theory; modality choices (visual, auditory and kinesthetic); multiple intelligence theory; comprehensive (holistic) education; experiential learning and symbol-based learning.
4	[11]	Prosiding: SCITEPRESS-Science and Technology Publication, Lda. All rights reserved	This study aims to apply a cooperative learning model based on audio visual media in improving the forehand and backhand drive skills of table tennis games of fifth grade students at Cinunuk 02 Elementary School, Bandung.
5	[12]	Jurnal Bola (Bersama Olahraga Laju Asia) Research and Learning Physical Education.	The purpose of this research is to find out how the learning outcomes of table tennis forehand techniques are improved by applying audio-visual media to class X students of SMK Negeri 1 Kuok.
6	[13]	Jurnal Pendidikan dan Pembelajaran Khatulistiwa.	This research aims to determine the influence of Audio and Visual-based Learning Media on Table Tennis Forehand Drive technique skills in Physical Education, Faculty of Teacher Training and Education, Tanjungpura University in 2016.
7	[14]	Multimedia Tools	The research that has been conducted is

		and Application.	research that utilizes advances in internet technology in learning table tennis movement skills.
8	[15]	Journal of Physical and Outdoor Education.	Title: Development of Audio Visual Media Based on Youtube Videos for Table Tennis Learning Materials. The purpose of this research is to: 1) produce a product in the form of audio visual media based on youtube videos for table tennis learning materials, 2) test the effectiveness of the product in increasing student interest in physical education learning table tennis material.
9	[16]	Jurnal Altius: Jurnal Ilmu Olahraga dan Kesehatan	This study aims to develop variations in learning on the ejection machine table tennis material in a table tennis book to support lectures for students in the table tennis course in the Physical Education, Health and Recreation study program.
10	[17]	Halaman Olahraga Nusantara (Jurnal Ilmu Keolahragaan)	The purpose of this research is to develop media for table tennis learning based on Android applications and the product feasibility has been tested and can be used in online lectures or can also be used as a guideline for offline lectures.
11	[18]	Kinestetik: Jurnal Ilmiah Pendidikan Jasmani	The research conducted aims to develop learning resources and media for students and the wider community in particular in the form of interactive multimedia-based table tennis game teaching materials.

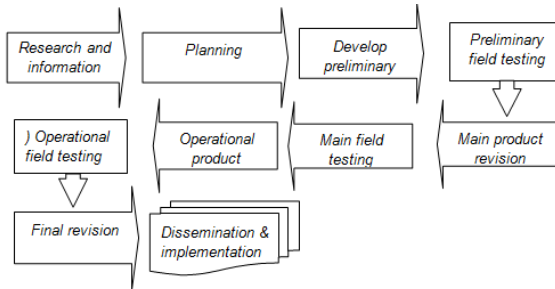
Source: Authors, Research Data

The novelty of the study entitled "Table Tennis Game Model for Early Childhood 6-8 years old)" is as follows: 1. The model developed in this study is a table tennis game model designed according to the needs of early childhood 6-8 years old. 2. The model developed is adjusted to the characteristics of early childhood 6-8 years old, namely using the concept of play. 3. The game media used is adjusted to the level of needs of early childhood 6-8 years old.

2. METHOD

This research uses research and development (R & D). The R & D method is used because this research is intended to produce a product. Borg and Gall in [19], states that R & D is a process used to develop and validate educational products. Borg and Gall in [19], states that R & D includes the following steps: (The first is to conduct a preliminary study, the second is to plan, the third is to develop the product/model,

the fourth is to review the initial model/product, the fifth is to revise the initial product/model, the sixth is to conduct a small trial, the seventh is to revise the product/model, the eighth is to conduct a large trial, the ninth is to finalize the product/model, and the last, namely the tenth, is to disseminate and implement the product/model. The steps of this research can be described as follows:



Picture 2.1 Borg and Gall Development Steps

Source: (Borg & Gall, 2005)

The population of this study were children at Cibubuan 1 Elementary School, Conggeang District, Sumedang Regency. The research subjects for the small trial with 12 students and the large trial with 30 students, implemented the product in the form of a table tennis game model for early childhood aged 6-8 years. The test instrument used was the forehand & backhand table tennis skill test instrument. The effectiveness test used 30 samples from children at Cibubuan 1 Elementary School, Conggeang District, Sumedang Regency.

Data analysis in the study of table tennis game models for early childhood aged 6-8 years aims to analyze the needs of table tennis games to be implemented. The analysis uses a test instrument for forehand and backhand table tennis skills. The instruments are as follows:

The table tennis skill test is a test that aims to measure table tennis playing skills, test subjects with a moderate level of skill. In the implementation of this study, the table tennis skill test instrument used was using a back board.

a. Tools and equipment:

- 1) A stop watch.
- 2) Table tennis balls.
- 3) Five bats.
- 4) A folded table tennis table.

- 5) A ball basket containing ping pong balls.
 - 6) A wall or pole for the support of the tennis table section that is set perpendicular to the horizontal part of the table.
 - 7) A 2 cm wide paper tape that is glued to the perpendicular part of the table, parallel to the horizontal part of the table and 15 cm from the table surface.
 - 8) Writing tools to record test results.
- b. Officers:
- 1) A time taker whose job is to give the commands "yes" and "stop".
 - 2) A person who counts the number of valid bounces for 30 seconds and simultaneously records the results.
 - 3) At least one assistant is tasked with picking up balls that cannot be controlled.
- c. Implementation:
- 1) The testee stands behind or on the continuation of the horizontal part of the table, with a bat and ball in hand.
 - 2) At the command "yes" the testee drops the ball on the table and then hits the ball on the horizontal part of the table.
 - 3) After the ball touches the flat table the testee tries to bounce the ball to the center board on the tape as many times as possible within 30 seconds.
 - 4) If the testee cannot control the ball, he can take the ball available in the box and like the initial procedure, he drops the ball on the table and tries to hit the ball as many times as possible within the time available.
 - 5) An assistant takes the ball that the testee does not control and puts it back in the box.
- d. A bounce is considered invalid if:
- 1) The ball is volleyed.
 - 2) The testee's bat is hit with the free hand when hitting the ball.
 - 3) The ball hits the upright part of the table, below the line.
 - 4) The testee serves at the start of the test.
 - 5) The testee hits the ball after the ball bounces more than once on a flat table.
 - 6) The testee hits the ball more than once with his feet resting on the side of the table.
 - 7) The tester stands near the table and counts the number of valid strokes for 30 seconds and records it. The testee is given the

opportunity to do the test three times with a 10-second break after each test.

- e. Scoring method: The score of each trial is the number of valid bounces during 30 seconds. The score of the test result is the number of hits from the three trials.
- f. Note: When the “stop” command is given but the ball has been hit and bounced legally, then the hit is counted.

Table 2. Table Tennis Skills Test Norms

SKORE	CATEGORY
0-53	Very Good
44-52	Good
26-43	Average
17-25	Poor
0-16	Very Poor

Source: (Asri, 2020)

After obtaining data from the tests that have been carried out, the next step is to carry out an analysis by comparing the pretest and posttest values and seeing whether there was a significant difference in the values. For this reason, statistical calculations were carried out using the t-test formula, namely:

$$t = \frac{\bar{x} - \mu_0}{S / \sqrt{n}}$$

Picture 3.3 t-Test Formula

Source: (Djaali and Muljono 2019)

Keterangan:

- t = T value
- \bar{x} = Sample mean
- μ_0 = Parameter value
- S = Standard deviation
- n = Number of samples

Next, the researcher developed the success criteria into interval scale data, namely as follows:

Table 3. Success Criteria

Skore	Category
4,55-5,00	Very Good
4,00-4,54	Good

2,55-3,99	Enough
1,00-2,54	Poor
0,00-0,99	Very Poor

Source: Modification (Djaali and Muljono 2019)

3. RESULTS AND DISCUSSION

3.1 Result

The results obtained from this study used observation sheets and skill test instrument sheets with a sample of 30 children aged 6-8 years at Cibubuan 1 Elementary School, Conggeang District, Sumedang Regency. This study aims to determine the validity and reliability of the forehand and backhand technique skill test instruments for table tennis.

Based on the results obtained from this study, forehand and backhand table tennis in early childhood aged 6-8 years were tested with 30 samples with an average forehand of 34.5 and an average for backhand of 31.1. The results of the assessment were tested for validity and reliability using Pearson correlation, the results are as follows:

Table 4. Validity

		Correlations	
		FOREHAND	BACKHAND
FOREHAND	Pearson Correlation	1	.104
	Sig. (2-tailed)		.748
	N	12	12
BACKHAND	Pearson Correlation	.104	1
	Sig. (2-tailed)	.748	
	N	12	12

Source: Author, Research Data

3.2 Discussion

Results or output obtained from this research, forehand and backhand table tennis in early childhood aged 6-8 years were tested with 30 samples with an average forehand of 34.5 and an average for backhand of 31.1. The assessment results were measured for validity and reliability using Pearson correlation, the results obtained were Pearson Correlation forehand 1, backhand 104 and N values forehand 12 and backhand 12. After conducting a reliability test with Cronbach's alpha, a value of $0.188 > 0.7$ was obtained, which means that the item is reliable for measuring the sample.

4. CONCLUSION

After seeing the results obtained from the data analysis, then the results of the validation by the expert team and seeing the results of the data analysis and conducting product trials on students of SDN Cibubuan 1, it was concluded; the research product entitled table tennis

game model for early childhood (6-8) years, can be used for the implementation of learning forehand stroke techniques and backhand stroke techniques in table tennis games in elementary schools.

REFERENCES

- [1] Husdarta, *Manajemen Pendidikan Jasmani*. Bandung: Alfabeta, 2018.
- [2] E. T. Rahayu, *Strategi Pembelajaran Pendidikan Jasmani Implementasi pada Pembelajaran Pendidikan Jasmani, Olahraga dan Kesehatan*. Bandung: Alfabeta, 2019.
- [3] A. Salim, *Buku Pintar Tenis Meja*. Bandung: Nuansa, 2018.
- [4] P. Simpson, *Teknik Bermain Pingpong*. Bandung: Pioner Jaya., 2018.
- [5] A. Nelistya, *Menjadi Juara Tenis Meja*. Bogor: Be Champion, 2017.
- [6] E. R. Fauziah, "PENGARUH GAME ONLINE TERHADAP PERUBAHAN PERILAKU ANAK SMP NEGERI 1 SAMBOJA," *eJournal Ilmu Komunikasi*, vol. 1, no. 3, pp. 1–16, 2023.
- [7] L. , R. D. , & S. K. W. Nawzad, "The Effectiveness of Technology for Improving the Teaching of Natural Science Subjects," *Indonesian Journal of Curriculum and Educational Technology Studies*, vol. 6, no. 1, pp. 15–21, 2018.
- [8] A. G. Dehkordi, "The Effect of Instructional-Aid Films on Learning of Table Tennis Techniques," in *Procedia - Social and Behavioral Sciences*, Elsevier, ltd, 2011, pp. 1656–1660. doi: 10.1016/j.sbspro.2011.03.348.
- [9] T. W. Ghafoor, "The Effect of Animated Images With and Without Musical Rhythms on Learning Forehand and Backhand Shots in Table-Tennis," *The Swedish Journal of Scientific Research*, vol. 2, no. 8, pp. 2001–9211, Aug. 2015, [Online]. Available: www.sjsr.se
- [10] Z. Ilham, "Penerapan Model Pembelajaran Savi Untuk Meningkatkan Hasil Belajar Forehand Drive Permainan Tenis Meja Mahasiswa Prodi PJKR Semester Ganjil FIK-Unimed," *Physical Education, Health and Recreation*, vol. 2, no. 1, 2017, [Online]. Available: <http://jurnal.unimed.ac.id/2012/index.php/jpehr/index>
- [11] F. Faisal, D. Budiana, and E. Hermanu, "Implementation of Cooperative Learning by Using Audio-Visual Media in Table Tennis Game Learning," in *Implementation of Cooperative Learning by Using Audio-Visual Media in Table Tennis Game Learning*, SCITEPRESS-Science and Technology Publications, Lda. All rights reserved, 2017, pp. 362–365.

- [12] D. Ahmadi, "Peningkatan Hasil Belajar Forehand dalam Permainan Tenis Meja dalam Penerapan Media Audio Visual pada Siswa SMKN 1 Bangkinang Kota," *Jurnal Bola (Bersama Olahraga Laju Asia) Research and Learning Physical Education*, vol. 1, no. 2, pp. 98–108, 2018.
- [13] A. Anggraini, A. Triansyah, and F. P. Hidasari, "Pengaruh Media Pembelajaran Audio Visual Keterampilan Forehand Drive Tenis Meja Penjas FKIP UNTAN 2016," *Jurnal Pendidikan dan Pembelajaran khatulistiwa*, no. 7, 2018.
- [14] L. Han, "Application Research of Internet Multimedia Technology in the Teaching of Table Tennis Difficult Movement Skills," *Multimed Tools Appl*, 2019, doi: 10.1007/s11042-019-7481-z.
- [15] A. O. Solihin, "Pengembangan Media Audio Visual Berbasis Video Youtube untuk Materi Pembelajaran Tenis Meja," *Journal of Physical and Outdoor Education*, vol. 2, no. 2, pp. 247–259, Oct. 2020.
- [16] A. Junaidi and H. Mustofa, "Pengembangan Variasi Pembelajaran Tenis Meja Menggunakan Ejection Machine," *Jurnal Altius: Jurnal Ilmu Olahraga dan Kesehatan*, vol. 9, no. 2, pp. 52–60, 2020, [Online]. Available: <https://ejournal.unsri.ac.id/index.php/altius/index>
- [17] M. N. Herliana, H. Millah, and S. Purnama, "Development of Table Tennis Learning Media Based on Android Applications," *Halaman Olahraga Nusantara (Jurnal Ilmu Keolahragaan)*, vol. 5, no. 1, p. 189, Jan. 2022, doi: 10.31851/hon.v5i1.6782.
- [18] A. Prabowo, S. Raibowo, and M. F. Rahmi, "Development of Basic Teaching Materials for Table Tennis in the Form of Interactive Multimedia for Education Students Sport Development Faculty of Sport Science Padang State University," *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, vol. 6, no. 2, pp. 402–410, Jun. 2022, doi: 10.33369/jk.v6i2.21278.
- [19] M. Waruru, "Metode Penelitian dan Pengembangan (R&D): Konsep, Jenis, Tahapan," *Jurnal Ilmiah Profesi Pendidikan*, vol. 9, no. 2, May 2024.

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