PROCEEDINGS OF INTERNATIONAL CONFERENCE ON EDUCATION
TEACHER TRAINING & EDUCATION FACULTY
UNIVERSITAS SERAMBI MEKKAH
NO. ISSN 2987-4564

DEVELOPING A BASKETBALL LEARNING MODEL FOR CHILDREN WITH AUTISM SPECTRUM DISORDER IN ELEMENTARY SCHOOLS

Habibi Hadi Wijaya[1], Firmansyah Dlis[2], Albert woltertangkudung[3], Widiastuti[4], Sugiharto[5], Dany Aulia[6]
[12345]Physical Education Doctoral Program, Pascasarjana Universitas Negeri Jakarta, Indonesia, Gedung M Program Pascasarjana Jl. Rawamangun Muka, Jakarta Timur 13220
[6]Sport Science Study Program, Faculty of Health Science, Universitas Singaperbangsa Karawang, Indonesia, Jl. HS.Ronggo Waluyo, Puseurjaya, Telukjambe Timur, Karawang, Jawa Barat 41361
*wijayahabibihadi@gmail.com

ABSTRACT

The purpose of this study was to develop a basketball learning model design for children with autism spectrum disorders in elementary schools. The research approach used is research and development with the Borg and Gall models. Research participants were taken from special elementary schools in Subang, Purwakarta and Karawang districts consisting of students (n=122) and sports teachers (n=10). Data collection techniques were carried out in three ways, namely observation, interviews and tests. Data analysis techniques used expert and peer tests through the stages of data reduction, data presentation and conclusion. Meanwhile, to determine the level of effectiveness of the model using the Paired Sample t-test. The results of the model test produce a basketball game learning model for autistic students consisting of movements 1) passing the ball in the shape of the letters A, I, U, E, O, C, 2) dribbling using a distance pattern from 1-2.5 M, 3) short dribble, toss right and left, zig-zag movement, and 4) shoot the ball left, right and forward. While the results of the basketball game tests obtained t-count (to) 4.336 and t-table 2.021 with 40 degrees of freedom and CL = 0.05. Thus 4.336 > = 2.021 or Ho is rejected. Because Ho was rejected, the hypothesis put forward was that there were differences in the results of the final test applying the basketball skills design model to autistic children. The basketball game model is named "ABI". The results of the research have implications for different learning experiences, the model developed also provides responsibility, and social and trains courage for students, so the learning model developed is also effective in increasing affective and social abilities. Students' motivation to take part in learning also increases because this learning model is easy to practice and can involve all students to be active.

Keywords: *Autism, Basketball, Elementary School, Learning*

1. INTRODUCTION

The learning process is a process of communication between educators and students that is carried out interactively, but for children with special needs, this cannot be done interactively. Autistic children experience neurodevelopmental disorders that are determined by verbal and nonverbal and social communication dysfunctions. However, until now the cause of autism has not been found with certainty (Pirzadroozbahani et al., 2018). This condition poses greater challenges to physical education, sports and health teachers in special primary schools, especially for elementary school students. Therefore, physical activity must be adapted to the child's ability to maximize the potential of children with special needs(Asrifah et al., 2020; Hassani et al., 2020; Rafikayati et al., 2018). This also has an impact on the learning outcomes of basketball which are not optimal or by the set learning objectives.

Some of the causes of physical activity problems for autistic students such as running and jumping in basketball games are difficult because they tend to be silent and confused about using basketball. Students tend to run and play randomly. Even though the teacher has communicated verbally, students are still not interactive. Therefore, teachers must be able to build interactive communication during the learning process of basketball skills so that learning objectives can be achieved. Therefore, physical activity must be adjusted to the child's ability to maximize the potential of children with special needs. Thus, learning basketball for special elementary school students must be made specifically according to the level of needs and abilities of autistic children.

Physical activity must be made into a structured program so that it can have an impact on the social interaction and skills of children with autism(Sefen et al., 2020; Zhao & Chen, 2018). Teachers can use a variety of games according to their level of autism so that their movement skills can improve(Roşca et al., 2022). However, other studies have shown that physical activity has no statistically significant effect on the coordination of individuals with ASD (Monteiro et al., 2022) (Monteiro et al., 2022).

From the findings of problems in special elementary schools that have been identified in West Java and previous research consideration the main reasons for conducting research and developing basketball skills. Mini-basketball learning is needed for children with autism to support motor skills, communication skills and be able to move independently. In terms of cognitive problems, children with autism who belong at an early age experience difficulties in receiving learning material due to a lack of understanding of children in receiving learning information. Children with autism have difficulty processing and retaining non-visual information. Basketball activities involve all aspects of communication, gross and fine motor aspects so the need for basic movement can be fulfilled with this activity. So, the purpose of this research is to design a basketball learning model for children with autism spectrum disorder at the elementary school level.

2. METHODS

This research approach uses a mixed method with research and development methods or known as R & D. This research aims to develop or create new products from existing or nonexistent products that are used for the benefit of education(Creswell &

Creswell, 2018). This research and development use the Borg and Gall model which consists of 10 steps(Gall et al., 2010). The ten steps are divided into two main steps, namely a preliminary study to examine the needs analysis and model design and a model evaluation. The participants involved in this study were elementary school students aged 10-12 years. The research subjects were taken from 1 Special Elementary School in the Subang district, 3 Outer Elementary Schools in the Purwakarta district, and 2 Outer Elementary Schools in the Karawang district with a total of 122 students. In addition, 10 colleagues or sports teachers were also involved as one of the product validators and 3 experts.

Data collection techniques were carried out in three ways, namely observation, interviews and tests. Observations and interviews were conducted with students and sports teachers at the preliminary study stage to collect information on the need for basketball games for autistic students in special elementary schools. Interviews were also conducted with sports teachers and experts who assessed the products. While the test is used during product trials so that the results of the effectiveness and feasibility of the basketball learning model can be known. Data analysis techniques were carried out qualitatively and quantitatively. The process of analyzing qualitative data is presented through the narrative of the data that has been analyzed and the quantitative analysis can be seen in the results of the basketball game tests carried out on product trials that used Paired Sample t-tests. In addition, the assessment of experts and colleagues is also a part of the data analysis procedure.

3. RESULTS & DISCUSSION

From the results of the needs analysis, several conclusions were found, including (1) 100% of autistic children in extraordinary elementary schools learned basketball. (2) 80% stated that autistic children in extraordinary elementary schools had difficulty learning basketball. (3) 90% of Physical Education, Sports and Health teachers need new methods that can help the basketball learning process to be more interesting and easy for children to do. (4) 30% of teachers stated that they had their way of teaching basketball skills. (5) 50% of teachers took advantage of the state of the school environment in teaching basketball lessons. (6) 40% of teachers modify learning tools to facilitate the basketball learning process. (7) 70% of the basketball learning process carried out by the teacher improves the child's motoric aspects. (8) 20% of teachers have used the command method through image media in the basketball learning process. (9) 90% of teachers use the demonstration method in learning basketball skills. (10) 100% of teachers said they needed basketball skills development models to improve children's skills.
The results of the assessment of colleagues, experts and small group trials obtained several inputs as data for improving the "ABI" basketball learning model, namely:

a) Easy and simple commands are given
b) Dribbling the ball takes longer to teach and repeat
c) The model dribbles zig-zag the distance of the cone is widened
d) When shooting, children may directly enter the ball.
e) Do repetitions
f) Provide clear and attractive images.
g) Pay attention to the stages from the simple ones
h) Pay attention to each model that is developed with its level of difficulty. Sort from easy model to difficult model.
i) Also, pay attention to the movement of each model from simple to complex movements.
j) Simple model naming.
k) The method of implementation in each model is made brief and clear so that users can understand it more easily.

Thus, the following is the final model of basketball learning for autistic students.

Table 1. The Variation of the Basketball Learning Model

	Name of Movement in Basketball
1	ABI love ball
2	ABI front outboard ball
3	ABI passes Red
4	ABI passes yellow
5	ABI passes green
6	ABI passes blue
7	ABI passes orange
8	ABI passes brown
9	ABI underfoot ball
10	ABI passes A
11	ABI passes I
12	ABI passes U
13	ABI passes E
14	ABI passes O
15	ABI passes C
16	ABI Herding Tossa
17	ABI Short dribble
18	ABI Shot right
19	ABI Dribbling left toss
20	ABI Herding delight 1
21	ABI Herding delight 1,5
22	ABI Herding delight 2
23	ABI Herding delight 2,5
24	ABI Drags swag to the right 1
25	ABI Drags swag to the right 1,5
26	ABI Herds swag to the left 1
27	ABI Herds swag to the left 1,5
28	ABI Drive zig zags
29	ABI shooting with pandas
30	ABI shot the right fruit 1
31	ABI shot the right fruit 2
32	ABI shoot left fruit 1
33	ABI shoot left fruit 2
34	ABI shot forward
35	ABI shoots tree leaves
36	ABI shoots birds

The results of the model test produce a basketball game learning model for autistic students consisting of movements 1) passing the ball in the shape of the letters A, I, U, E, O, C, 2) dribbling using a distance pattern from 1-2.5 M, 3) short dribble, toss right and left, zig-zag movement, and 4) shoot the ball left, right and forward. The basketball game model is named "ABI".

The results of the basketball game tests obtained t-count (to) 4.336 and t-table 2.021 with 40 degrees of freedom and CL = 0.05. Thus 4.336 > = 2.021 or Ho is rejected. Because Ho was rejected, the hypothesis put forward was that there were differences in the results of the final test applying the basketball skills design model to autistic children.

The advantages of the product are;

- Learning from stages that are easily mastered by autistic children.
- Learning adapted to the characteristics of autistic children
- Children look happy in doing learning
- Children do learning from simple movements to complex movements.

While the disadvantages of products are;

- This research has not been widely implemented
- Small field testing, large field testing and effectiveness testing were carried out in special elementary schools located in Karawang Regency, Subang Regency, and Purwakarta Regency.
- The differences in the characteristics of autistic children in each region influence the results of this development research.

Based on the findings of this study that during trials, the developed model can be applied to autistic children with disabilities who have one of several disability designations (eg, autism spectrum disorder, traumatic brain injury). The researcher emphasizes to future teachers that to gain a better understanding of the complexities of teaching, greater attention needs to be paid to students' and teachers' perceptions of the challenges and barriers to teaching children with autism. The research findings reveal that teachers cannot provide material on their own to autistic children and need a companion teacher in conveying the basketball learning model. This is due to the diversity of students with autism who have different behaviour in each student.

Furthermore, these findings show that physical exercise with a ball can change the behavioural stereotypes of children with autism spectrum disorders. (Arslan et al., 2022; Nazemzadegan et al., 2016; Rafiei Milajerdi et al., 2021). Wang et al. have also demonstrated the effectiveness of a 12-week mini-basketball training program through regular physical exercise in improving treatment outcomes in preschoolers with an autism spectrum disorder. Wang et al. have also demonstrated the effectiveness of a 12-week mini-basketball training program through regular physical exercise in improving treatment outcomes in preschoolers with autism spectrum disorder (K. Cai et al., 2020; W. Cai & Baek, 2022; Wang et al., 2020; Yang et al., 2021). Other studies have shown that sports influence prosocial behaviour in children and adolescents with special needs, so they are recommended (Li & Shao, 2022).

4. CONCLUSION

The results of the study concluded that the basketball skill learning model for autistic students at the elementary school level is called "ABI". Data analysis shows that the basketball learning model for special elementary school students has been systematically arranged according to the level of ability, the characteristics of the child, and the condition of sports and healthy physical education infrastructure facilities in elementary schools. There are 36 movements in a basketball skill game that autistic students can do. The results of the model test produce a basketball game learning model for autistic students consisting of movements 1) passing the ball in the shape of the letters A, I, U, E, O, C, 2) dribbling using a distance pattern from 1-2.5 M, 3) short dribble, toss right and left, zig-zag movement, and 4) shoot the ball left, right and forward. The basketball skills learning model for Autism Spectrum Disorder (ASD) is stated to be very feasible to apply in sports and health physical education learning in special elementary schools.

The results of the research have implications for different learning experiences, the model developed also provides responsibility, and social and trains courage for students so that the learning model developed is effective in increasing affective and social abilities. In addition, students' motivation to take part in learning also increases because this learning model is easy to practice and can involve all students to be active. The results of this study provide recommendations for sports teachers in special elementary schools regarding creativity and innovation that must be carried out in sports learning because physical activity for autistic students has different challenges than normal students.

5. ACKNOWLEDGMENTS

Thank you to all students, teachers and colleagues who have been directly involved in the process of research and development of this basketball learning model, especially the special elementary schools in 1 Special Elementary School in the Subang district, 3 Outer Elementary Schools in the Purwakarta district, and 2 Outer Elementary Schools in Karawang district.

6. REFERENCES

Arslan, E., Ince, G., & Akyüz, M. (2022). Effects of a 12-week structured circuit exercise program on physical fitness levels of children with autism spectrum condition and typically developing children. *International Journal of Developmental Disabilities*, *68*(4), 500–510. https://doi.org/10.1080/20473869.2020.1819943

Asrifah, S., Solihatin, E., Arif, A., Rusmono, & Iasha, V. (2020). Pengaruh Model Pembelajaran Problem Based Learning Terhadap Hasil Belajar Pendidikan Pancasila Dan Kewarganegaraan Siswa Kelas V SDN Pondok Pinang 05. *Buana Pendidikan: Jurnal Fakultas Keguruan Dan Ilmu Pendidikan Unipa Surabaya*, *16*(30), 183–193. https://doi.org/10.36456/bp.vol16.no30.a2719

Cai, K., Yu, Q., Herold, F., Liu, Z., Wang, J., Zhu, L., Xiong, X., Chen, A., Müller, P., Kramer, A. F., Müller, N. G., & Zou, L. (2020). Mini-basketball training program improves social communication and white matter integrity in children with autism. *Brain Sciences*, *10*(11), 1–14. https://doi.org/10.3390/brainsci10110803

Cai, W., & Baek, S. S. (2022). Effects of 24-week basketball programme on body composition and functional fitness on adults with Down syndrome. *Journal of Intellectual Disability Research*, *66*(12), 939–951. https://doi.org/10.1111/jir.12951

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches the fifth edition*. SAGE Publications Inc.

Gall, M. D., Gall, J. P., & Borg, W. R. (2010). *Educational Research an Introduction Seventh Edition*. WIley.

Hassani, F., Shahrbanian, S., Shahidi, S. H., & Sheikh, M. (2020). Playing games can improve physical performance in children with autism. *International Journal of Developmental Disabilities*, *68*(2), 219–226. https://doi.org/10.1080/20473869.2020.1752995

Li, J., & Shao, W. (2022). Influence of Sports Activities on Prosocial Behavior of Children and Adolescents: A Systematic Literature Review. *International Journal of Environmental Research and Public Health*, *19*(11). https://doi.org/10.3390/ijerph19116484

Monteiro, C. E., Da Silva, E., Sodré, R., Costa, F., Trindade, A. S., Bunn, P., Costa e Silva, G., Di Masi, F., & Dantas, E. (2022). The Effect of Physical Activity on Motor Skills of Children with Autism Spectrum Disorder: A Meta-Analysis. *International Journal of Environmental Research and Public Health*, *19*(21). https://doi.org/10.3390/ijerph192114081

Nazemzadegan, G., Babadi, A., Zeinali, Z., & Kakavandi, K. (2016). Effectiveness of Ball Exercises on Reduction of Stereotypic Behavior of Children With Autism Spectrum Disorder With High Performance. *Iranian Rehabilitation Journal*, *14*(2), 121–126. https://doi.org/10.18869/NRIP.IRJ.14.2.121

Pirzadroozbahani, N., Ahmadi, S. A. Y., Hekmat, H., Roozbahani, G. A., & Shahsavar, F. (2018). Autism and KIR genes of the human genome: A brief meta-analysis. *Egyptian Journal of Medical Human Genetics*, *19*(3), 159–164. https://doi.org/10.1016/J.EJMHG.2017.10.005

Rafiei Milajerdi, H., Sheikh, M., Najafabadi, M. G., Saghaei, B., Naghdi, N., & Dewey, D. (2021). The Effects of Physical Activity and Exergaming on Motor Skills and Executive Functions in Children with Autism Spectrum Disorder. *Games for Health Journal*, *10*(1), 33–42. https://doi.org/10.1089/g4h.2019.0180

Rafikayati, A., Badiah, L. I., & Soedarmadji, D. B. (2018). Pengaruh implementasi layanan bimbingan pribadi sosial terhadap penyesuaian diri anak berkebutuhan khusus (ABK) di sekolah inklusif sman 10 Surabaya. *Buana Pendidikan: Jurnal Fakultas Keguruan Dan Ilmu Pendidikan Unipa Surabaya*, *14*(26), 151–157. https://doi.org/10.36456/bp.vol14.no26.a1680

Roşca, A. M., Rusu, L., Marin, M. I., Ene Voiculescu, V., & Ene Voiculescu, C. (2022). Physical Activity Design for Balance Rehabilitation in Children with Autism Spectrum Disorder. *Children (Basel, Switzerland)*, *9*(8). https://doi.org/10.3390/children9081152

Sefen, J. A. N., Al-Salmi, S., Shaikh, Z., AlMulhem, J. T., Rajab, E., & Fredericks, S. (2020). Beneficial Use and Potential Effectiveness of Physical Activity in Managing Autism Spectrum Disorder. *Frontiers in Behavioral Neuroscience*, *14*. https://doi.org/10.3389/FNBEH.2020.587560

Wang, J. G., Cai, K. L., Liu, Z. M., Herold, F., Zou, L., Zhu, L. N., Xiong, X., & Chen, A. G. (2020). Effects of Mini-Basketball Training Program on Executive Functions and Core Symptoms among Preschool Children with Autism Spectrum Disorders. *Brain Sciences*, *10*(5). https://doi.org/10.3390/BRAINSCI10050263

Yang, S., Liu, Z., Xiong, X., Cai, K., Zhu, L., Dong, X., Wang, J., Zhu, H., Shi, Y., & Chen, A. (2021). Effects of mini-basketball training program on social communication impairment and executive control network in preschool children with autism spectrum disorder. *International Journal of Environmental Research and Public Health*, *18*(10). https://doi.org/10.3390/ijerph18105132

Zhao, M., & Chen, S. (2018). The Effects of Structured Physical Activity Program on Social Interaction and Communication for Children with Autism. *BioMed Research International*, *2018*. https://doi.org/10.1155/2018/1825046