



APPLICATION OF EXERCISE GAMES IN DEVELOPING PHYSICAL FITNESS TO THE STUDENTS OF VIETNAM AVIATION ACADEMY

Le Huu Toan¹ⁱ,

Tran Nam Giao²

¹MA, Vietnam Aviation Academy,
Vietnam

²Dr., Vietnam National University
Ho Chi Minh City Center for Sport,
Vietnam

Abstract:

The article aims to identify various exercise games to help students at Vietnam Aviation Academy improve their fitness. The study has identified 11 popular workout games for physical development after gathering and evaluating data from academic materials and interviews with experts and specialists. The results of the experiment involving 80 students over their one-year course reveal that the chosen exercise games have a greater influence on the experimental group than on the control group ($P < 0.05$).

Keywords: exercise games, physical fitness, students, Vietnam Aviation Academy

1. Introduction

Exercise games are human activities that are represented by two main factors: entertainment and mental satisfaction. As a result, physical education in general and exercise games in particular are widely regarded as essential in the development of morality, willingness, courage, and solidarity, all of which play a vital role in the formation and development of important qualities and skills in children. Furthermore, exercise games are one of the most effective ways for the participants to build physical strength and enhance their health, and the practitioner engages in a voluntary, positive, proactive, and engaging manner.

Games in general, and fitness games in particular, are crucially significant in physical education. They are seen as an educational tool that aids pupils in improving their health and fitness. Exercise games or fitness games are usually well-organized, with clear rules, and mostly based on modern or folk games featuring unique names. Students are expected to use all of their motor skills to cope with the challenges during the fitness

ⁱ Correspondence: toanlh@vaa.edu.vn

exercises, as a consequence, their physical health is reinforced. Understandably, game-based learning has gained popularity since it includes not only a clear set of rules, objectives, assessment, and needed actions, but also competitiveness to entice numerous youths to engage.

Based on their real-life experience teaching physical education, The writers are aware that the physical fitness of the students at Vietnam Aviation Academy has not met the standard. Hence, it is vital to figure out the feasible solutions to increase their physical condition as well as improve the fitness training quality in the long term. Knowing the advantages of exercise games, the authors chose to do an extensive study on: “Application of exercise games in developing physical fitness to the students of Vietnam Aviation Academy”

The purpose of this article is to determine some appropriate exercise games and assess their effectiveness in the physical fitness of students at Vietnam Aviation Academy. The findings are hoped to improve the quality of physical education and training for the next generation of athletes.

2. Methodology

For this study, the researchers made use of document references and analysis, questionnaires and interviews, pedagogical test method, pedagogical experimental method, mathematical and statistical method.

The research object was centered on some exercise games to develop physical fitness for students at Vietnam Aviation Academy.

The research subjects were 140 male and 20 female first-year students of Vietnam Aviation Academy, divided into two groups. The control group consisted of 70 female students and 10 male first-year students of Vietnam Aviation Academy practice according to the current school's curriculum. The experimental group consisted of 70 female students and 10 male first-year students of Vietnam Aviation Academy practice according to the experimental program.

The interviewees' team was composed of 4 experts, 3 specialists, and 9 physical education lecturers in Ho Chi Minh City.

3. Results and discussions

3.1. Selection of some suitable exercise games for both schoolboys and schoolgirls of Vietnam Aviation Academy

There are 2 steps involved:

Step 1: Make a collection of exercise games for students from the study works of reliable writers: Ali SKS (2018), Nguyen Hung Dung (2021), Ezendam N.P., Brug J., Oenema A. (2012), Fei Xin et al., (2020), Gordon Slethaug (1995), Nguyen Van Thanh (2017), Tran Dong Lam, Dinh Manh Cuong (2005), Nguyen Thi Nguyet (2009), Le Anh Tho (2010), Dao Ba Tri (1999), University of Sports I (2002), etc. Based on the features of

learners' physical fitness, current facility condition and yards of Vietnam Aviation Academy, 15 exercise games have been chosen for the following step.

Step 2: Implement a survey with experts, specialists, and PE lecturers at Ho Chi Minh City.

A questionnaire form was created to collect the opinions of four experts, three specialists, and nine physical education lecturers at Ho Chi Minh City. To simplify the answers, the response form was supposed to be "Agree" and "Disagree". Then, the article would choose the items on which more than 75% of all replies agree. Following the criteria, the article has selected 11 fitness games for physical training of students at Vietnam Aviation Academy, including:

- Fast-paced training games: Cat and mouse, Capture the flag, Relay race.
- Power-up games: Relay frog jump, Call out.
- Games that improve endurance: Dragon snake, Waves clapping
- Games that improve flexibility and ingenuity: Ball throw into the basket, Team up, Drive the ball over the post, Run and pass the ball.

3.2. Evaluation of how effective some exercise games bring to the development of the physical fitness of students at Vietnam Aviation Academy

There were two groups involved in the experiment. The experimental group would practice according to the authors' new curriculum, while the control group would continue to follow the current one. The period was 2019 – 2020; the location was Vietnam Aviation Academy. The evaluation items: physical fitness tests for Vietnamese students based on the Decision 53/2008/BGDDT: 30m sprint (second), long jump (cm), 4x10m shuttle run (second), 5-minute run (m).

First, the experiment was conducted according to the plan. After the experiment, the article proceeded to assess the fitness performance of the research subjects by calculating the average value (\bar{X}), standard deviation (S), and then comparing the mean values of the experimental group and the control one through the T-test of two independent samples. The results were presented in Table 3.1:

Table 3.1: Comparison of the average values of the fitness assessment tests of the experimental group and the control group after the experiment

	Test	\bar{X}_{EG}	S	\bar{X}_{CG}	S	d	t	P
Female	30m sprint (second)	5.67	0.46	6.08	0.57	0.41	4.66	<0.05
	Long jump (cm)	169.93	11.51	163.90	11.33	6.03	3.12	<0.05
	4x10m shuttle run (second)	11.74	0.84	12.32	0.58	0.59	4.81	<0.05
	5-minute run (m)	851.50	85.72	834.93	97.81	16.57	1.07	>0.05
Male	30m sprint (second)	4.78	0.50	5.52	0.39	0.74	3.70	<0.05
	Long jump (cm)	228.0	12.29	213.0	17.51	15.0	2.22	<0.05
	4x10m shuttle run (second)	11.06	0.56	11.97	0.96	0.91	2.59	<0.05
	5-minute run (m)	1004.50	133.72	973.0	152.90	31.50	0.49	>0.05

Note: df = 138, 18 $t_{05} = 1.977, 2.101$

Statistics of Table 3.1 indicate that:

For the female students, it is obvious that the average values of schoolgirls' fitness performance of the experiment group when the exercise games are employed during PE classes is higher than that of the control group in regards to 4x10m shuttle run (second), 30m sprint (second), and long jump (cm) because of $t_{\text{calculated}} > t_{05} = 1.977$, $P < 0.05$. However, the test item of a 5-minute run (m) is very comparable in both groups since $t_{\text{calculated}} = 1.07 < t_{05} = 1.977$, $P > 0.05$.

Figure 3.1 was made to show the comparison of the average values of the fitness assessment tests performed by the female students in the two groups after the experiment.

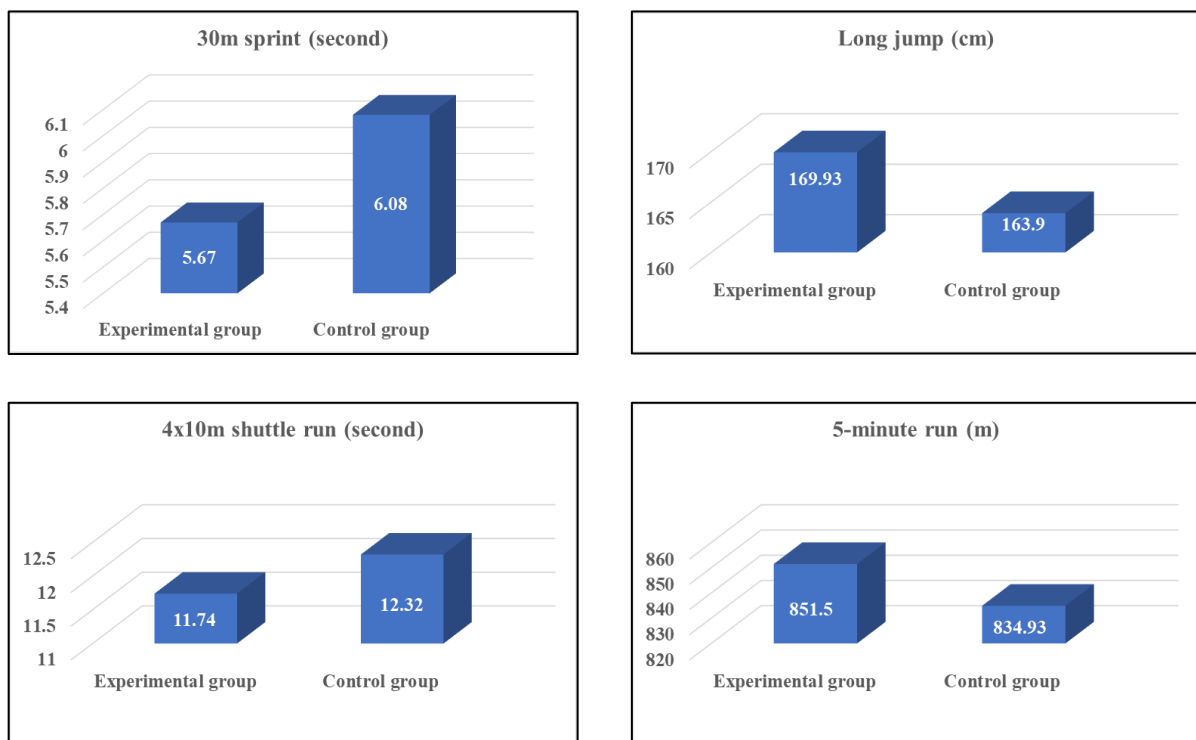


Figure 3.1: Comparison of the average values of the fitness assessment tests performed by the female students from the experimental and control groups after the experiment

For the male students, similarly, when exercise games are used during PE lessons, the average values of schoolboys' fitness performance are greater in the experimental group than in the control group. in regards of 4x10m shuttle run (second), 30m sprint (second), and long jump (cm) because $t_{\text{calculated}} > t_{05} = 2.101$, $P < 0.05$. Nevertheless, the two groups' performances on the 5-minute run (m) are not significantly different since $t_{\text{calculated}} = 0.49 < t_{05} = 2.101$, $P > 0.05$.

Figure 3.2 was made to represent the comparison of the average values of the fitness assessment tests performed by the male students of the two groups after the experiment.

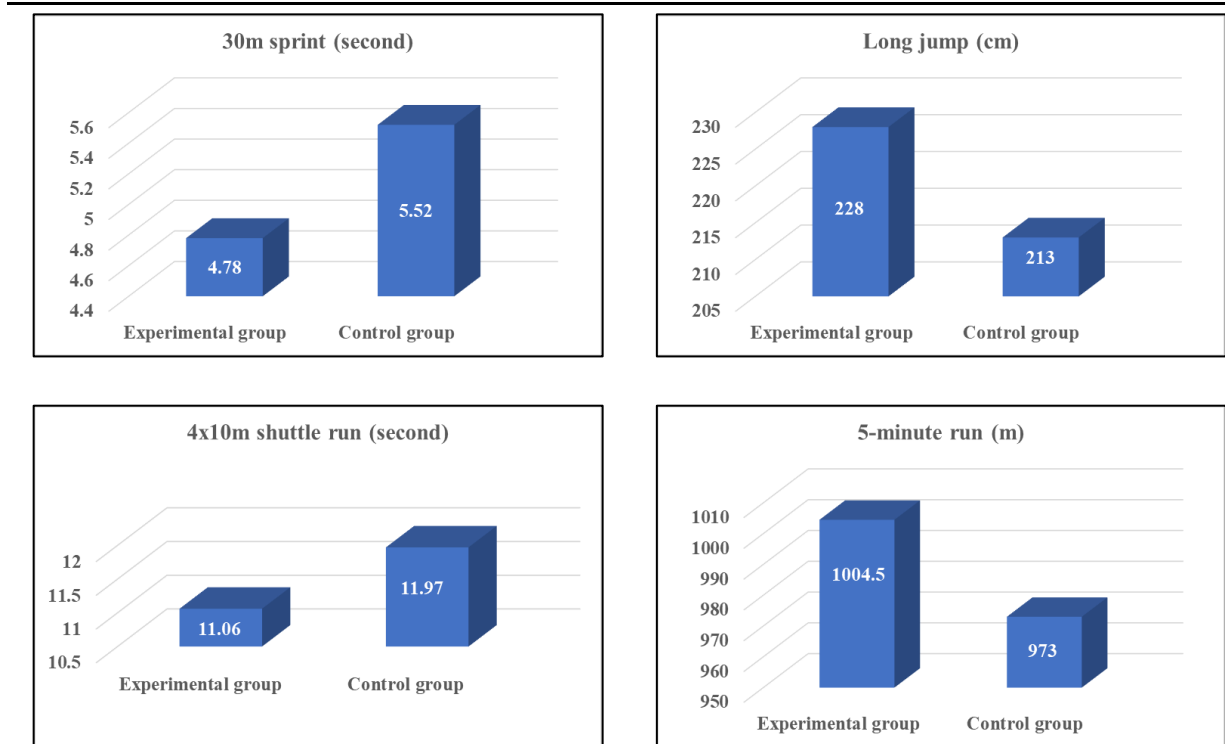


Figure 3.2: Comparison of the average values of the fitness assessment tests performed by the male students from the experimental and control groups after the experiment

The above analysis results have revealed that the experimental group's average post-experiment values for most fitness tests are greater than the control group's. Thus, it is proven that the application of 11 selected exercise games has a positive impact on the fitness development of Vietnam Aviation Academy students.

To corroborate the effectiveness of the above fitness games, the author calculated the growth rate (w), looked at the average value of two samples, and obtained the results that were presented in Table 3.2.

Table 3.2: The growth rate of general fitness tests of the female students in the experimental and control groups before and after the experiment

	Test	Before the experiment		After the experiment				
		\bar{X}_{EG}	S	\bar{X}_{CG}	S	\bar{W}	T	P
The experimental group (n = 70)	30m sprint (second)	6.65	0.54	5.67	0.46	15.88	17.26	<0.05
	Long jump (cm)	153.86	12.54	169.93	11.51	10.03	16.87	<0.05
	4x10m shuttle run (second)	12.73	0.67	11.74	0.84	8.25	11.61	<0.05
	5-minute run (m)	770.79	91.15	851.50	85.72	10.11	12.06	<0.05
						13.50		
The control group (n = 70)	30m sprint (second)	6.74	0.52	6.08	0.57	10.45	11.55	<0.05
	Long jump (cm)	153.40	12.69	163.90	11.33	6.71	9.86	<0.05
	4x10m shuttle run (second)	12.81	0.69	12.32	0.58	3.86	11.06	<0.05
	5-minute run (m)	771.59	90.86	834.93	97.81	7.86	6.79	<0.05
						7.96		

Note: $df = n - 1 = 69$, $t_{05} = 1.995$

Statistics of Table 3.2 indicates that:

For the experimental group, the general fitness performance of the schoolgirls had a significant growth at the probability threshold $P < 0.05$, since $t_{\text{calculated}} > t_{\text{table}} = 1.995$ and $P < 0.05$. Average growth rate $\bar{W} = 13.50\%$; the test item of 4x10m shuttle run (second) has the lowest growth rate $\bar{W} (= 8.25\%)$. The fitness growth rate of the female pupils in the experimental group after the experiment was shown in Figure 3.3.

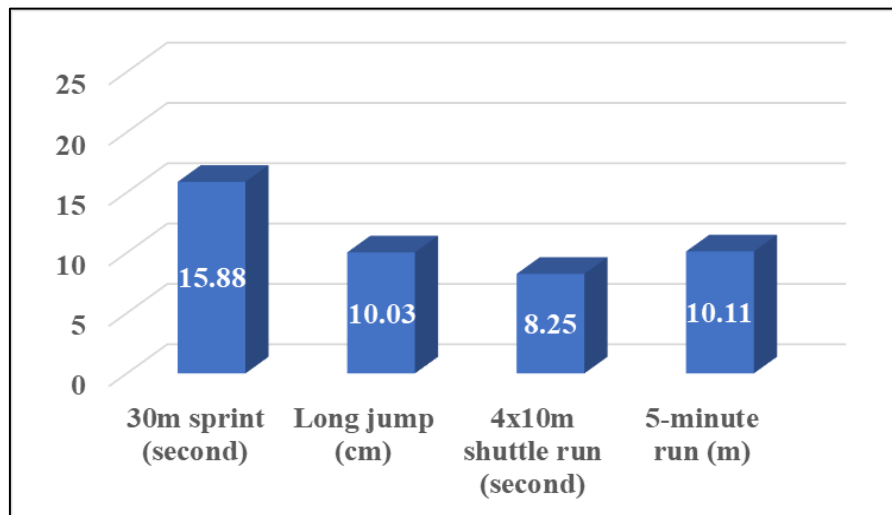


Figure 3.3: The fitness growth rate of the female pupils in the experimental group after the experiment

For the control group, the general fitness performance of the schoolboys had an important growth at the probability threshold $P < 0.05$, because of $t_{\text{calculated}} > t_{\text{table}} = 1.995$ and $P < 0.05$. Average growth rate $\bar{W} = 7.96\%$; the test item of 4x10m shuttle run (second) has the lowest growth rate $\bar{W} = 3.86\%$. The fitness growth rate of the male pupils in the experimental group after the experiment was shown in Figure 3.4.

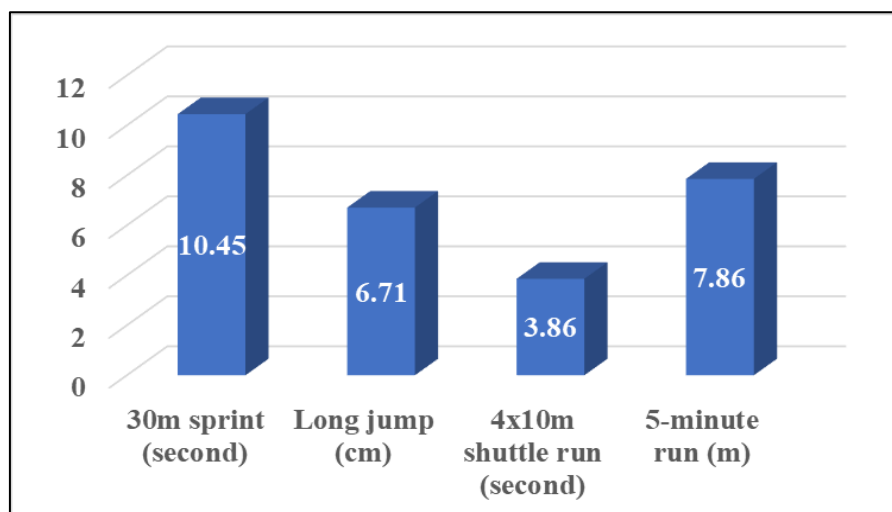


Figure 3.4: The fitness growth rate of the male pupils in the experimental group after the experiment

The study team opted to compare the two groups' growth rates by measuring the mean value of two independent samples to evaluate the effectiveness of the selected exercise games. Table 3.3 summarizes the data.

Table 3.3: Comparison of the average fitness growth rate of the experimental and control group after the experiment

	Test	\overline{W}_{EG}	S	\overline{W}_{CG}	S	d	t	P
Female	30m sprint (second)	15.88	7.59	10.45	7.97	5.43	4.13	<0.05
	Long jump (cm)	10.03	5.14	6.71	5.75	3.32	3.61	<0.05
	4x10m shuttle run (second)	8.25	5.97	3.86	2.90	4.38	5.53	<0.05
	5-minute run (m)	10.11	7.30	7.86	10.60	2.25	1.47	>0.05
Male	30m sprint (second)	17.61	12.22	4.05	6.15	13.56	8.29	<0.05
	Long jump (cm)	9.50	3.46	2.86	0.98	6.64	5.84	<0.05
	4x10m shuttle run (second)	9.98	5.88	1.87	1.75	8.11	3.15	<0.05
	5-minute run (m)	10.66	10.58	7.10	6.49	3.57	0.91	>0.05

Note: $df = n_{TN} + n_{BC} - 2 = 70 + 70 - 2 = 138$, $t_{05} = 1.977, 2.101$

Table 3.3 reveals that:

For the female students, the experimental group performs considerably better than the control group in terms of average fitness growth rate applied to 30m sprint (second), long jump (cm), and 4x10m shuttle run (second), because of $t_{calculated} > t_{table} = 1.977$ and $P < 0.05$. The test of the 5-minute run has a comparable average growth rate between the two groups when $t_{calculated} < t_{05} = 1.977$, $P > 0.05$.

The results suggest that the recommended fitness games have benefited the experimental group's overall physical development.

Figure 3.5 shows the comparison of the average fitness growth rate of the female students in both the control and experimental groups after the experiment.

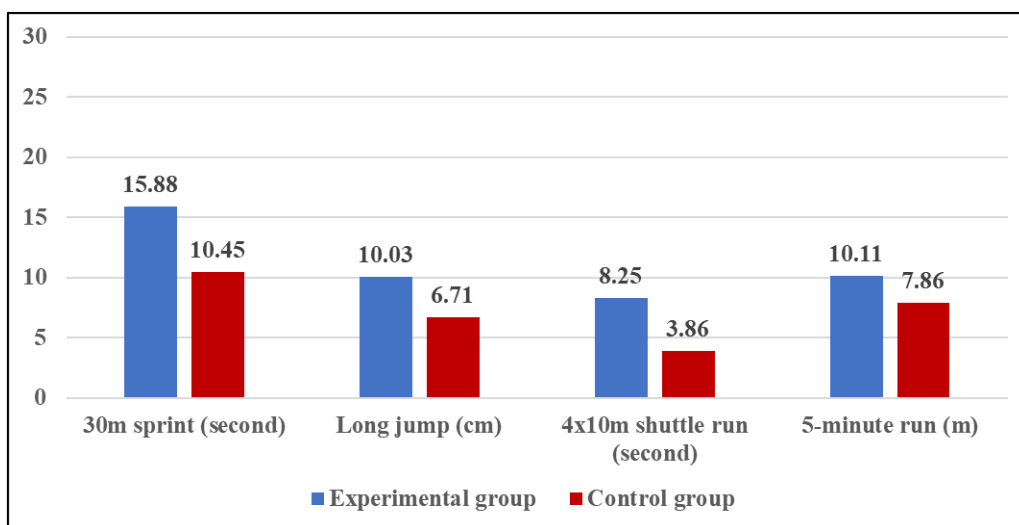


Figure 3.5: Comparison of the fitness growth rate of the female students in the control and experimental groups after the experiment

For the male students, the average fitness growth rate applied to 30m sprint (second), long jump (cm), and 4x10m shuttle run (second) of the experimental group performs significantly better than the control group, because of $t_{\text{calculated}} > t_{\text{table}} = 2.101$ and $P < 0.05$. The test of 5-minute run has a similar average growth rate between the two groups when $t_{\text{calculated}} < t_{05} = 2.101$, $P > 0.05$.

The results indicate that the chosen fitness games have shown benefits to the overall physical development of the experimental group.

The comparison of the average fitness growth rate of the male students in both the control and experimental groups after the experiment is shown in Figure 3.6.

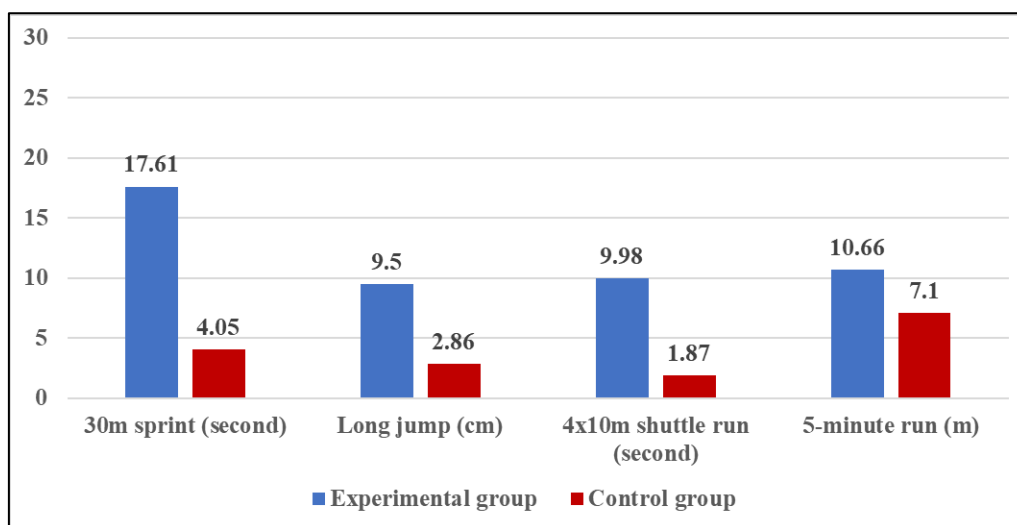


Figure 3.6: Comparison of the fitness growth rate of the male students in the control and experimental groups after the experiment

The experimental group with the use of fitness games has a higher average fitness growth rate than the control group, as evidenced by the two charts 3.5 and 3.6. As a result, it can be stated that 11 selected exercise games used in physical education classes at the Vietnam Aviation Academy have a positive impact on the students' overall physical development.

5. Conclusion

The article has selected 11 exercise games to develop the physical fitness of Vietnam Aviation Academy students. Based on a range of analyses and comparisons, it is thought that the fitness games have a positive impact on the development of the students' general fitness, as indicated by the result that the experimental group's physical performance outgrew the control groups.

Conflict of Interest Statement

The authors declare no conflicts of interest.

About the Authors

Le Huu Toan has been a physical education teacher at Vietnam Aviation Academy, Vietnam.

Tran Nam Giao has been a physical education teacher at Vietnam National University Ho Chi Minh City Center for Sport, Vietnam.

References

- Ali S. K. S. (2018). *The importance of physical activities in our life*. Int Phys Med Rehab J. 2018;3(4):308-310. DOI: 10.15406/ipmrj.2018.03.00121.
- Nguyen Hung Dung, Nguyen Toan Nang, Nguyen Quang Vinh (2021). An investigation of exercise games on the physical development of male 5 – 6-year-old students at preschools in Dong Thap, Viet Nam. *European Journal of Physical Education and Sport Science*, Volume 7, issue 3.
- Ezendam N. P., Brug J., Oenema A. (2012). *Evaluation of the Web-based computer-tailored FATaintPHAT intervention to promote energy balance among adolescents: results from a school cluster randomized trial*. Arch Pediatr Adolesc Med; 166(3): 248-55.
- Fei Xin et al. (2020). *Relationship between Fundamental Movement Skills and Physical Activity in Preschool-aged Children: A Systematic Review*, International Journal of Environmental Research and Public Health, 17, 3566.
- Gordon Slethaug (1995). *Game Theory” and “Play/Free Play theories*. Encyclopedia of contemporary literary theory. University of Toronto Press.
- Nguyen Van Thanh (2017). *Application of game-based approach in teaching physical education to primary school students in Vinh City, Nghe An province*. Dissertation in Education, Ho Chi Minh University of sports.
- Tran Dong Lam, Dinh Manh Cuong (2005). *Exercise games*, Pedagogical University Publishing House.
- Nguyen Thi Nguyet (2009). *Application of a number of games to develop general physical fitness for high school students in the Central Highlands, Duc Trong district, Lam Dong province*, Master's thesis in education, University of Sports Ho Chi Minh City.
- Le Anh Tho (2010). *Folk games and national sports of Vietnam*, Hanoi Sports Publishing House.
- Dao Ba Tri (1999). *Textbook of movement games*, (Book for students of the University of Sports and Physical Education), Hanoi Sports Publishing House.
- The University of Physical Education and Sports I (2002). *Textbook of movement games*, Hanoi Sports Publishing House.

Creative Commons licensing terms

Authors will retain the copyright of their published articles agreeing that a Creative Commons Attribution 4.0 International License (CC BY 4.0) terms will be applied to their work. Under the terms of this license, no permission is required from the author(s) or publisher for members of the community to copy, distribute, transmit or adapt the article content, providing a proper, prominent and unambiguous attribution to the authors in a manner that makes clear that the materials are being reused under permission of a Creative Commons License. Views, opinions and conclusions expressed in this research article are views, opinions and conclusions of the author(s). Open Access Publishing Group and European Journal of Physical Education and Sport Science shall not be responsible or answerable for any loss, damage or liability caused in relation to/arising out of conflict of interests, copyright violations and inappropriate or inaccurate use of any kind content related or integrated on the research work. All the published works are meeting the Open Access Publishing requirements and can be freely accessed, shared, modified, distributed and used in educational, commercial and non-commercial purposes under a [Creative Commons attribution 4.0 International License \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/).