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Assessing the Impact of Vovinam Martial Arts in Physical Education on the Technical and Mental Development of Students at the University of Danang

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Abstract
The study conducted at the University of Danang thoroughly evaluated the impact of the improved physical education program integrating Vovinam martial arts — which included 11 core training groups such as stance techniques, punching, kicking, blocking, counterattack, and sparring — compared to the previous program, with the aim of analyzing differences in students' technical proficiency and mental state after the experimental period. The results showed that the experimental group not only achieved significantly superior technical improvements, as reflected in higher average scores and better performance stability in specialized tests ($p < 0.001$), but also demonstrated notable enhancements in mental aspects, including overall health, confidence, enthusiasm, and a positive attitude toward the subject. These findings confirm the comprehensive effectiveness of the improved Vovinam program, highlighting its essential role in enhancing the quality of physical education, fostering character development and determination among students, as well as contributing to the preservation and promotion of Vietnam's cultural heritage; the study recommends continuing to widely apply this program at other universities and expanding long-term research to assess its deeper impacts.

Keywords: Impact of Vovinam martial arts, Vovinam in the physical education curriculum, Technical proficiency and mental state, Students at the University of Danang, University of Danang

1. Introduction

Physical education at universities plays a crucial role not only in developing students' physical fitness but also in enhancing their life skills, mental resilience, and personal qualities. In the context of many countries focusing on integrating traditional martial arts into educational programs to improve both technical abilities and mental strength, Vovinam — a symbol of Vietnamese cultural heritage — stands out with its blend of technique and fighting spirit, having spread widely both domestically and internationally but still underutilized in Vietnam's university physical education programs. Addressing this gap, the present study focuses on evaluating the impact of the improved Vovinam program at the University of Danang on students' technical proficiency and mental state by applying 11 training groups including stance techniques, punching, kicking, blocking, counterattacks, and sparring, comparing the effectiveness between the new and old programs. Additionally, the study proposes solutions to enhance teaching quality, aiming to establish a solid foundation for students' comprehensive development, while providing scientific evidence to support the broader application of the Vovinam program across o universities nationwide.

The study addresses two key questions:

- What is the impact of Vovinam martial arts on the technical proficiency of students at the University of Danang?
- What is the impact of Vovinam martial arts on the mental state of students at the University of Danang?

2. Methods

2.1. Research Design

This study employed a mixed-methods approach, combining both qualitative and quantitative analyses. The methods included:

- **Document analysis**: Reviewing regulations, reports, and related studies on Physical Education and Vovinam martial arts.
- **Sociological survey**: Collecting opinions from students and staff through questionnaires.
- **In-depth interviews**: Conducting discussions with 15 lecturers and 10 administrators to understand challenges.
- **Observation**: Assessing the training quality and development of the control and experimental groups.
- **Mathematical statistics**: Analyzing data using SPSS software, ensuring reliability with Cronbach's Alpha = 0.82.

2.2. Research Sample

The sample consisted of 197 students (selected through stratified random sampling) and 25 administrators and lecturers at the University of Danang.

2.3. Data Analysis

Data were coded using a 3-point Likert scale (1: Poor, 3: Good). Mean scores and percentages were used to assess the feasibility of the exercises and the questionnaires.

3. Results

3.1. The Impact Effectiveness of Vovinam Martial Arts on the Technical Performance of Students at the University of Danang

3.1.1. Selection of Technical Evaluation Tests for Experimental Subjects

Based on references and the synthesis of previous studies, a total of 9 technical evaluation tests were selected are listed in Table 3.1. To ensure that the selected tests were aligned with the official Vovinam curriculum, the study conducted interviews with 25 experts, including researchers, lecturers, coaches, and referees in the field of Vovinam.

Table 3.1: Selection of Technical Evaluation Tests for Experimental Subjects (n = 25)

No.	Item	Good (3)	Fair (2)	Poor (1)	Total Score	Mean
1	Hook punch to target in 10 seconds	24 (96.0%)	1 (4.0%)	0 (0.0%)	74	2.96
2	Side kick (horizontal thrust) to target in 10 seconds	23 (92.0%)	2 (8.0%)	0 (0.0%)	73	2.92
3	Roundhouse kick to two opposing targets at 2.5 meters distance in 20 seconds	13 (52.0%)	4 (16.0%)	8 (32.0%)	55	2.2
4	Circular kick + chopping kick to target in 10 seconds	0 (0.0%)	7 (28.0%)	18 (72.0%)	32	1.28
5	V-step foot switching combined with straight punches to target in place in 20 seconds	22 (88.0%)	2 (8.0%)	1 (4.0%)	71	2.84
6	Front thrust kick to target in 15 seconds	24 (96.0%)	1 (4.0%)	0 (0.0%)	74	2.96
7	Back thrust kick to target in 10 seconds	0 (0.0%)	0 (0.0%)	25 (100.0%)	25	1
8	Continuous double-leg circular kicks to target in 30 seconds	15 (60.0%)	5 (20.0%)	5 (20.0%)	65	2.6
9	Roundhouse kick to target in 10 seconds	20 (80.0%)	4 (16.0%)	1 (4.0%)	69	2.76

Based on the analysis of average scores, priority selection rates, and expert consensus, the study selected the five most prominent tests, including:Hook punch to target in 10 seconds, Side kick (cross kick) to target in 10 seconds, V-step foot switching combined with straight punches to target in place in 20 seconds, Front thrust kick to target in 15 seconds, Roundhouse kick to target in 10 seconds.

3.1.2. The Impact of Vovinam on Students' Reaction Speed (Concentration Ability, Recognition, and Quick Response) After the Experimental Period

To evaluate the impact of Vovinam training on students' reaction speed (including concentration ability, recognition, and quick response) after the experimental period, the study assessed male and female students from both the experimental and control groups after one year of training. The results are presented in Tables 3.2 and 3.3.

Table 3.2: Comparison Results of Reaction Speed (Concentration, Recognition, and Quick Response Ability) Between the Male Experimental Group and the Male Control Group After the Experimental Period

No.	Test Items for Reaction Speed Assessment	Experimental Male Group(n=48)				Control Male Group (n=49)				t	p
		$\bar{x} \pm \delta$	$\bar{x}$	σ	Cv	$\bar{x} \pm \delta$	$\bar{x}$	σ	Cv		
1	Hook punch to target in 10 seconds	18.32 ± 1.58	18.32	1.58	8.19	15.19 ± 1.43	15.19	1.43	9.41	8.24	<0.001
2	Side kick (cross kick) to target in 10 seconds	16.45 ± 1.32	16.45	1.32	7.62	12.18 ± 1.21	12.18	1.21	9.93	14.75	<0.001
3	V-step foot switching combined with straight punches to target in place in 20 seconds	37.82 ± 2.13	37.82	2.13	5.35	30.47 ± 1.98	30.47	1.98	6.50	15.37	<0.001
4	Front thrust kick to target in 15 seconds	22.11 ± 1.76	22.11	1.76	7.56	18.29 ± 1.67	18.29	1.67	9.13	10.29	<0.001

5	Roundhouse kick to target in 10 seconds	18.22 ± 1.45	18.22	1.45	7.56	14.36 ± 1.28	14.36	1.28	8.91	14.15	<0.001

Table 3.3. Comparison Results of Reaction Speed (Concentration, Recognition, and Quick Response Ability) Between the Experimental Female Group and the Control Female Group After the Experimental Period.

No.	Test Items for Reaction Speed Assessment	Experimental Female Group (n=49)				Control Female Group(n=51)				t	p
		$\bar{x} \pm \delta$	$\bar{x}$	σ	Cv	$\bar{x} \pm \delta$	$\bar{x}$	σ	Cv		
1	Hook punch to target in 10 seconds	10 ± 1.20	10	1.2	12.0	8 ± 1.35	8	1.35	16.88	7.79	<0.001
2	Side kick (cross kick) to target in 10 seconds	9 ± 1.10	9	1.1	12.22	7 ± 1.20	7	1.2	17.14	7.75	<0.001
3	V-step foot switching combined with straight punches to target in place in 20 seconds	23 ± 1.80	23	1.8	7.83	20 ± 2.10	20	2.1	10.5	7.35	<0.001
4	Front thrust kick to target in 15 seconds	15 ± 1.50	15	1.5	10.0	10 ± 1.80	10	1.8	18.0	14.79	<0.001
5	Roundhouse kick to target in 10 seconds	12 ± 1.30	12	1.3	10.83	8 ± 1.50	8	1.5	18.75	15.16	<0.001

Following the intervention period, the comparative results between the experimental and control groups (Tables 3.2 and 3.3) demonstrated statistically significant improvements in reaction speed, concentration, and situational awareness. In male students, the experimental group consistently outperformed the control group across all quick motor skill tests (hook punch, side kick, V-step with straight punch, front thrust kick, and roundhouse kick), with lower or comparable standard deviations. The corresponding t-values ranged from 8.24 to 15.37 ($p < 0.001$), indicating both improved performance and higher consistency.

A similar pattern was observed among female students, with the experimental group achieving superior results in all reaction speed tests ($t = 7.35–15.16$, $p < 0.001$). The coefficient of variation (CV) in both male and female experimental groups was also lower or on par with the control group, suggesting more stable performance across individuals.

These findings further highlight the program's psychological benefits. The selected tests required simultaneous activation of motor speed and cognitive alertness, pointing to improvements in mental focus, situational decision-making, and neural coordination. Movements such as punching and kicking under time constraints demanded not only muscular speed but also rapid information processing and response execution.

In conclusion, the results presented in Tables 3.2 and 3.3 confirm that the intervention program effectively enhanced students' technical skills, focus, and reactivity. Additionally, it contributed to better emotional regulation, competitive readiness, and cognitive-motor integration—factors essential for comprehensive development in contemporary physical education.

3.2. Psychological Impact of Vovinam Martial Arts on Students at the University of Danang (Perception, Motivation, and Attitude)

To evaluate the psychological impact of Vovinam training on students at the University of Danang—particularly in terms of perception, motivation, and attitude—a structured questionnaire was developed. This tool was designed through consultations with 25 experts, including educational psychologists, academic researchers, and university lecturers. The finalized instrument was then administered to student participants to assess the effectiveness of the program.

3.2.1. Selection of the Evaluation Tool for Assessing the Psychological Effects of Vovinam

Table 3.4: Selection of Technical Evaluation Tests for Experimental Subjects (n = 25)

No.	Item	Good (3)	Fair (2)	Poor (1)	Total Score	Mean
1	Improved sleep and a refreshed feeling	24	1	0	74	2.96
2	Better health and enhanced quality of life	25	0	0	75	3
3	Participation in training and performances receives praise	0	0	25	25	1
4	Reduction in bad habits and social vices	23	2	0	73	2.92
5	Loss of energy and negative impact on academic performance (reverse-coded)	24	1	0	74	2.96
6	Demonstration of passion, interest, athletic talent, and determination	22	3	0	72	2.88
7	Participation in training due to peer influence	0	2	23	27	1.08
8	Strengthened relationships, communication, life skills, bravery, and self-confidence	21	4	0	71	2.84
9	Inspiration, optimism, joyful spirit, and love of life	25	0	0	75	3
10	Development of virtues and improvement of personality traits	24	1	0	74	2.96
11	Desire to continue practicing	25	0	0	75	3
12	Lack of desire to continue due to difficulty in performing complex movements (reverse-coded)	0	4	21	29	1.16
13	Improved appearance and increased self-awareness	19	5	1	68	2.72

Based on the analysis presented in Table 3.4, ten reliable items were selected to construct the questionnaire used in the survey. These items reflected key indicators of the program's psychological impact, including: Improved sleep quality and a refreshed feelin, Enhanced health and overall quality of life, Reduction in harmful habits and social vices, Decreased energy or negative effects on academic performance (reverse-coded), Expression of enthusiasm, interest, athletic ability, and determination, Strengthened interpersonal relationships, communication, life skills, bravery, and self-confidence, Inspiration, optimism, joyful spirit, and zest for life, Development of virtues and improvement of personality

traits, Desire to continue practicing, Improved physical appearance and greater attention to personal grooming.

3.2.2. The Impact of Vovinam on University of Danang Students in Terms of Perception, Enthusiasm, and Attitude

Since the program was applied equally to both male and female students, the goal of the study was to assess the overall impact, and the experimental content would not change based on gender. Therefore, the study focused on measuring the overall results for both male and female students and improving the content to be suitable for all students. The results are presented in Table 3.5.

Table 3.5: Impact of Vovinam on University of Danang Students in the Experimental and Control Groups After the Experiment in Terms of Mental Aspects (Perception, Interest, Attitude)

No.	Question Item	Student Choices – Experimental Group (n=97)			Student Choices – Control Group (n=100)			Comparison	
		Yes (%)	No (%)	Not Specific (%)	Yes %	No %	Not Specific (%)		P
1	Good sleep, refreshed feeling	83 (85.57%)	4 (4.12%)	10 (10.31%)	73 (73.0%)	16 (16.0%)	17 (17.0%)	9.28	<0.01
2	Improved health, enhanced quality of life	88 (90.72%)	2 (2.06%)	6 (6.19%)	72 (72.0%)	11 (11.0%)	17 (17.0%)	13.02	<0.01
3	Reduction of bad habits and social vices	55 (56.7%)	6 (6.19%)	32 (32.99%)	50 (50.0%)	20 (20.0%)	30 (30.0%)	7.60	<0.05
4	Loss of energy, negative impact on academic performance	87 (89.69%)	3 (3.09%)	6 (6.19%)	72 (72.0%)	10 (10.0%)	12 (12.0%)	7.16	<0.05
5	Demonstration of passion, interest, athletic talents, and will to succeed	18 (18.56%)	63 (64.95%)	16 (16.49%)	17 (17.0%)	61 (61.0%)	17 (17.0%)	0.07	>0.05
6	Strengthening relationships, communication, life skills, bravery, and self-confidence	86 (88.66%)	0 (0.0%)	11 (11.34%)	73 (73.0%)	10 (10.0%)	11 (11.0%)	11.02	<0.01
7	Inspiration, optimism, joyful spirit, love of life	93 (95.88%)	2 (2.06%)	2 (2.06%)	84 (84.0%)	7 (7.0%)	9 (9.0%)	7.65	<0.05
8	Development of virtues, personality improvement	80 (82.47%)	2 (2.06%)	15 (15.46%)	71 (71.0%)	8 (8.0%)	21 (21.0%)	5.09	>0.05
9	Desire to continue training	83 (85.57%)	10 (10.31%)	14 (14.43%)	70 (70.0%)	7 (7.0%)	23 (23.0%)	10.25	<0.01
10	Improved appearance, personal attention	89 (91.75%)	0 (0.0%)	8 (8.25%)	88 (88.0%)	8 (8.0%)	20 (20.0%)	11.55	<0.01

Based on the findings presented in Table 3.5, the formal Vovinam training program had a significantly positive psychological impact on students in the experimental group compared to those in the control group. The proportion of students selecting "Yes" was markedly higher across most indicators. For instance, 90.72% of the experimental group reported improved health and quality of life versus 72% in the control group ($p < 0.01$). Likewise, 88.66% expressed enhanced passion, interest, athletic motivation, and determination, compared to 73% in the control group ($p < 0.01$).

The program also fostered personal development and life skills. A notable 95.88% of experimental group students acknowledged progress in interpersonal communication, confidence, and life skills, surpassing the 84% in the control group ($p < 0.05$). Additionally, 85.57% reported improved personality and virtue development, compared to 70% in the control group ($p < 0.01$).

While 82.47% of the experimental group felt greater inspiration and optimism, the difference with the control group (71%) was not statistically significant ($p > 0.05$), suggesting variation in individual emotional perception. Regarding academic impact, 64.95% of the experimental group and 61% of the control group rejected the notion that training led to exhaustion or hindered study performance, with no significant difference ($p = 0.07$).

In conclusion, the Vovinam training program demonstrated clear psychological benefits, particularly in enhancing well-being, motivation, personal growth, and essential life skills among university students.

5. Conclusion

The findings confirm that the enhanced Vovinam program exerts a significantly positive effect on students' mental well-being at the University of Danang. Students in the experimental group reported markedly higher levels of perceived health (90.72% vs. 72%, $p < 0.01$), optimism and resilience (88.66% vs. 73%, $p < 0.01$), and life skills and self-confidence (95.88% vs. 84%, $p < 0.05$) compared to the control group.

Moreover, 85.57% of the experimental group acknowledged improvements in moral character and personal integrity, a statistically significant increase over the 70% observed in the control group ($p < 0.01$). Although the enhancement in optimism and enjoyment of life (82.47% vs. 71%) did not reach statistical significance ($p > 0.05$), the results suggest a favorable psychological trend.

In terms of cognitive-motor performance, the experimental group demonstrated superior reaction speed, focus, and situational awareness ($p < 0.001$), indicating enhanced neural adaptability applicable to both academic and everyday contexts.

In conclusion, the Vovinam training program not only improves physical and motor abilities but also promotes mental health, personal development, and a strong internal drive for progress. These findings support broader adoption of the program and advocate for continued research to further evaluate its long-term contributions to holistic student

development and the promotion of national cultural identity.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

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