

The Development of Integrated Physical Education Teaching to Enhance Physical Fitness of Students in Higher Vocational Colleges Kunming City

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Abstract

The purposes of this research were to develop and compare integrated physical education teaching to enhance physical fitness before and after teaching between the experiment group and control group.

The sample group consisted of grade 1 students in the physical education course of Yunnan vocational college of tourism of the academic year 2023. The researcher randomly selected the sample classrooms using a cluster random sampling method by drawing lots to determine the research sample classrooms. Two classrooms were selected and divided into an experimental group of 50 students and a control group of 50 students. The research was conducted for 1.5 hours per week, totally ten weeks. The tools used in the study were 1) integrated physical education teaching, consisting of 10 lesson plans with an IOC average congruence index of 0.97 and 2) The physical fitness test on BMI, speed, endurance, flexibility and strength measurement form, National students physical health standards test in china with a reliability of 0.92. The data was analyzed using means and standard deviations, and the difference in average score was tested using a t-test.

The research findings were as follows:

1. Development of integrated physical education teaching design, consisting of 10 lesson plans to enhance the physical fitness of students in higher vocational colleges, Kunming city.
2. The average of physical fitness students in the experimental group in speed, endurance, flexibility and strength, who received integrated physical education teaching significantly increased at the .05 level. However, the students in the control group, who received conventional normal physical education teaching, not significantly at the .05 level
3. After the experiment, the average of physical fitness students in speed, endurance, and strength of the experimental group was significantly higher than that of students in the control group at the .05 level. However, the students BMI and flexibility, not significantly at the .05 level

Keywords: Integrated Physical Education Teaching; Physical Fitness; Students Higher Vocational Colleges

Introduction

In recent years, China's demand and requirements for career are constantly rising, so that the professional quality of the educated is higher requirements. The reason why education is so valued by people is that it plays an important role in improving the comprehensive quality of the people and promoting the all-round development of the people. Colleges and universities are an important place for students to carry out comprehensive physical exercise, and for students to leave school and face the society. Higher vocational education is developed into three levels of modern vocational education: junior college level vocational education, undergraduate level vocational education and graduate level vocational education. China higher vocational education has formed a relatively complete system covering the four levels of junior college, undergraduate degree, master's degree and doctor's degree. (Wang, 2014)

The innovation of physical education teaching integrated in higher vocational colleges should have innovative physical education professional teachers. Teachers creative thinking and creative education and teaching work have a profound and lasting impact on students. The development of modern education requires that teachers should be innovative education talents with extensive basic knowledge, profound professional knowledge, who can track and grasp the advance of subject development and have strong general ability and outstanding specialized ability. The innovation of teaching content and the flexibility of teaching integrated methods are an important symbol of physical education innovation teaching, but it is also the most difficult problem to balance. How to realize the new and live at the same time and not dispel the enthusiasm of students in the learning process is a problem that cannot be ignored. There is a lack of rationality in the selection of teaching content. Many schools pay too much attention to the cultivation of students' physical education skills in the process of physical education, the teaching only serves the realization of the three-dimensional goal of teaching. The innovation physical education course teaching integrated system that meets the characteristics of students future major is of practical significance. To improve the physical education teaching system, attach importance to strengthening the training of college students' physical quality and ability in all aspects, increase students' professional physical quality and psychological quality, and promote the improvement of students' overall level. To make higher vocational students after graduation quickly adapt to the post requirements, then it should be on the sports course optimization innovation teaching integrated for higher vocational college students professional demand of physical education teaching system, in order to improve college students' physical quality ability as one of the goals, meet the demand of higher vocational colleges students career and more in line with the social demand for talent. (Zeng, 2021; Zhao, 2021)

Modern physical education teachers in higher vocational colleges should have the consciousness and ability of innovation. The direct requirement of knowledge for education is to constantly reform and innovate, to cultivate innovative talents to meet the needs of knowledge economy. As a physical education teacher, we should dare to face the challenge of knowledge economy, design, reform and innovate teaching methods with innovative thinking, attitude and scientific spirit. In the face of school physical education, we must fully implement the guiding ideology of "health first", we must be familiar with the knowledge of physical education and health education, improve the ability of health education and teaching management as soon as possible, and effectively use modern education technology to improve efficiency and quality. (Zhang, 2017) The application of innovative teaching methods in the current physical education teaching in higher vocational schools is scientific, which can not

only stimulate the enthusiasm of students to participate in sports, but also build a good relationship between teachers and students. Therefore, in the teaching process, teachers need to fully understand the current physical education teaching integrated requirements in higher vocational colleges, and flexibly use the innovative education mode, to effectively improve the teaching quality. States that over the years, most of the teaching content of physical education in colleges and universities in China is based on practical skills and sports, fixing the teaching content, emphasizing the unity of teaching, and students participate in physical education learning in a passive learning way. The enthusiasm is suppressed and restricted the development of physical education teaching. (Li & Dong, 2018; Yao & Cao, 2019)

With the advent of modern information technology and knowledge economy era, the reform and innovation of public physical education teaching in ordinary colleges and universities are imperative. (Yao, 2021) Physical education course is a course to develop students' physical and mental health, enhance physical fitness and master physical education knowledge and skills. The reform of public physical education teaching in ordinary universities is to promote the better development of physical education, better adapt to modern quality education and the development of higher education; and better adapt to the needs of The Times. It is beneficial to cultivate college students correct awareness of physical education, to enhance students' physical quality and social adaptability, and to cultivate high-quality talents in socialist modernization construction. The necessary conditions for physical education teachers include lofty ideology and moral character, necessary knowledge and skills, complete professional work ability, healthy body. These four conditions can be established under any historical conditions after liberation, but they do not fully reflect the intelligent spatial structure of teachers, and they do not analyze the process of how to achieve such a structure. (Zhang, 2020)

Cultivating innovative talents is the basic goal of talent training in colleges and universities, and it is also to adapt to the social requirements of talent quality under the condition of market economy. According to the needs of the market, the development trend of the society and the sustainable development of individual students, the overall goal of the teaching system reform is established, and the theoretical basis for the orientation and application of professional courses is put forward. To establish a new teaching oriented by social needs, supported by subject system and aimed at the purpose of student development, and build a diversified teaching model. Adjust and reform the teaching system, teaching structure and teaching content, establish a new curriculum system of basic education, and try out the combination of national teaching, local teaching and school teaching integrated. (Yan, 2019)

The lack of innovative of integration physical education teaching in Yunnan vocational colleges, both as a learning resource and in reaching students, has seriously hindered the physical development of vocational college students.

This paper aims to explore how innovative physical education can provide a solid foundation for enhancing the physical fitness of students in higher vocational colleges in Yunnan province.

Research Objective

Through integrated physical education teaching, the study is expected to achieve the following study objectives:

1. Develop integrated physical education teaching to enhance physical fitness of students in higher vocational colleges, Kunming City
2. Compare integrated physical education teaching to enhance physical fitness before and after teaching between the experiment group and control group
3. Compare integrated physical education teaching to enhance physical fitness after the experiment between experimental group and control group

Literature Review

- 1 Physical education teaching structure
2. Integrated innovation teaching in physical education
3. The importance of integrated innovation teaching
4. The quality and ability of physical education teacher
5. Physical fitness for students in higher vocational colleges

Research Methodology

The research of quasi-experimental research with a pre and post-test design in 2 experimental groups methods.

1. Population and Sample

The sample group consisted of grade 1 students in the physical education course of Yunnan vocational college of tourism of the academic year 2023. The researcher randomly selected the sample classrooms using a cluster random sampling method by drawing lots to determine the research sample classrooms. Two classrooms were selected and divided into an experimental group of 50 students and a control group of 50 students. The design of this study is group pretest and post-test design.

2. Research instruments

Table 1 integrated physical education teaching innovation of 10 lesson plans

Lesson Plan	Topic	Time (hour)
1	Integrated physical education teaching innovation of physical fitness strength training	1.5
2	Integrated physical education teaching innovation of physical fitness endurance training	1.5
3	Integrated physical education teaching innovation of physical fitness speed training	1.5
4	Integrated physical education teaching innovation of physical fitness flexibility training	1.5
5	Integrated physical education teaching innovation of physical fitness strengthening training	1.5

6	Integrated physical education teaching innovation of physical fitness endurance training	1.5
7	Integrated physical education teaching innovation of physical fitness speed strengthening training	1.5
8	Integrated physical education teaching innovation of physical fitness flexibility strengthening training	1.5
9	Physical fitness of strength endurance comprehensive training	1.5
10	Physical fitness of speed flexibility comprehensive training	1.5

1) The research instruments design integrated physical education teaching innovation consisting of 10 lesson plans by the experts of physical education department of Yunnan Vocational College of Tourism was IOC average congruence index of 0.97. 2) The physical fitness test are BMI, speed, endurance, flexibility and strength measurement form National students physical health standards test in China with a reliability of 0.92

3. Data collection

After all the research instruments were developed and approved, the researchers conducted the study to develop the teaching. The process is explained as follows: The research was conducted for 1.5 hours per week total 10 weeks. Physical fitness students test and data collection were conducted before and after the physical education teaching integrated experiment and control group.

4. Data analysis

The data collected from all developed research instruments were analyzed as follows: The researchers analyzed the data using means, percentage, and standard deviation. The investigators analyzed the data to compare differences in students physical fitness using the t-test samples.

Table 2 Results of the t-test analysis pre-test of independent samples from the experimental and control groups

Pre-test Boy N = 50	Control		Experimental		t	p
	Mean	SD	Mean	SD		
1. BMI	19.96	3.82	19.79	5.04	0.13	0.89
2. 50 meters	7.79	0.37	7.56	0.48	1.833	0.07
3. Standing long jump	219.48	24.97	226.88	19.60	-1.16	0.25
4. Sit forward	9.57	6.27	11.15	7.54	-0.81	0.43
5. 12 Minutes running	2001.4	291.76	1968	206.12	0.47	0.64

Pre-test Girl N = 50	Control		Experimental		t	p
	Mean	SD	Mean	SD		
1. BMI	20.05	3.31	20.15	3.30	-0.09	0.92
2. 50 meters	10.15	0.75	9.95	0.56	1.07	0.29
3. Standing long jump	153.92	12.53	153.88	9.40	0.01	0.99
4. Sit forward	14.48	5.19	15.61	5.30	-0.76	0.45
5. 12 Minutes running	1697.2	91.54	1695.2	110.99	0.07	0.95

* $p < .05$

As shown in table 2 before the start of the experiment, first with initial testing of the physical fitness of the experimental group and control boys and girls. The test results show, physical fitness of the 5 items $p < .05$. Explained that there was no significant difference in the physical fitness of boys and girls in the initial experimental and control groups, all the students were on the same exercise level line.

Research Conceptual Framework

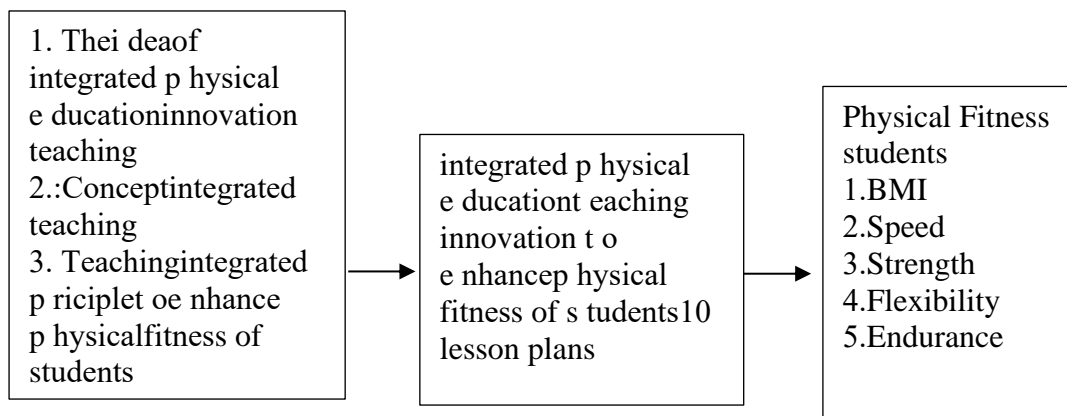


Figure 1 Research Conceptual Framework

Research Results

This study presents the results of the data analysis of this study as follows:

- 1) Compare integrated physical education teaching to enhance physical fitness before and after teaching between the experiment group and control group.
- 2) Compare integrated physical education teaching innovation to enhance physical fitness after the experiment between experimental group and control group.

Table 3 Compare the experimental groups pre and post-test results for physical fitness.

Experimental Boy N = 25	Pre-test		Post-test		t	p
	Mean	SD	Mean	SD		
1. BMI	19.79	5.04	19.81	4.82	-0.19	0.96
2. 50 meters	7.56	0.49	7.51	0.44	3.16	0.01*
3. Standing long jump	226.88	19.60	236.32	19.71	-18.99	0.00*
4. Sit forward	11.15	7.54	12.78	7.28	-15.93	0.00*
5. 12 Minutes running	1968	206.12	2058.8	206.24	-17.70	0.00*

Experimental Girl N = 25	Pre-test		Post-test		t	p
	Mean	SD	Mean	SD		
1. BMI	20.15	3.31	20.18	3.29	-1.09	0.22
2. 50 meters	9.95	0.56	9.78	0.59	7.62	0.02*
3. Standing long jump	153.88	9.41	162.84	9.26	-34.29	0.00*
4. Sit forward	15.61	5.30	16.76	5.28	-25.03	0.04*
5. 12 Minutes running	1695.2	110.99	1780.4	100.10	-21.06	0.07

* $p < .05$

As shown in table 3, after experiment 10 weeks the boys and girls in the experimental group during the physical fitness test, physical fitness of the 50 meters, standing long jump, sit forward and 12 Minutes running significantly increased at the .05 level but BMI of boys and girls and 12 Minutes running in girls did not significantly change at the .05 level.

Table 4 Compare the control group pre and post-test results for physical fitness.

Control Boy N = 25	Pre-test		Post-test		t	p
	Mean	SD	Mean	SD		
1. BMI	19.96	3.82	20.04	3.60	-1.25	0.22
2. 50 meters	7.79	0.37	7.77	0.35	0.75	0.46
3. Standing long jump	219.48	24.97	219.64	24.49	-0.39	0.70
4. Sit forward	9.57	6.27	10.07	5.71	-2.02	0.06
5. 12 Minutes running	2086.4	291.76	2089.6	298.21	-0.79	0.44

Control Girl N = 25	Pre-test		Post-test		t	p
	Mean	SD	Mean	SD		
1. BMI	20.05	3.31	20.08	3.34	-0.55	0.59
2. 50 meters	10.15	0.75	10.22	0.66	-1.67	0.12
3. Standing long jump	153.92	12.53	154.92	11.79	-2.58	0.02*

4. Sit forward	14.48	5.19	14.54	5.33	-0.87	0.39
5. 12 Minutes running	1697.2	91.54	1698.4	85.77	-0.31	0.76

* $p < .05$

As shown in table 4, after experiment 10 weeks the boys and girls in the control group during the physical fitness test, did not significantly change at the .05 level but standing long jump in the girls significantly increased at the .05 level.

Table 5 Compare the experimental and control groups post-test results for physical fitness.

Post-test Boy N = 50	Control		Experimental		t	p
	Mean	SD	Mean	SD		
1. BMI	20.04	3.60	19.81	4.82	0.19	0.85
2. 50 meters	7.77	0.35	7.51	0.44	2.34	0.02*
3. Standing long jump	219.64	24.49	236.32	19.71	-2.65	0.01*
4. Sit forward	10.07	5.71	12.78	7.28	-1.46	0.15
5. 12 Minutes running	2004.6	298.21	2060.8	204.27	0.78	0.44
Post-test Girl N = 50	Control		Experimental		t	p
	Mean	SD	Mean	SD		
1. BMI	20.08	3.34	20.18	3.29	-0.11	0.91
2. 50 meters	10.22	0.66	9.78	0.59	2.49	0.02*
3. Standing long jump	154.92	11.79	162.84	9.26	-2.64	0.01*
4. Sit forward	14.54	5.33	16.76	5.28	-1.48	0.11
5. 12 Minutes running	1698.4	85.77	1780.4	100.10	-3.11	0.01*

* $p < .05$

As shown in table 5, after the experiment, the average of physical fitness students in speed, endurance, and strength the experimental group was significantly higher than that of students in the control group at the .05 level. However, the average of physical fitness students in BMI and flexibility, did not significantly change at the .05 level.

Discussion

Through the research and comparison of the pre and post-test scores of the experimental group and the control group, the integrated physical education teaching innovation enhances physical fitness students be summarized as follows:

1. BMI: The study conducted by (John et al., 2007) investigated the impact of additional physical education (PE) time on various health metrics, including body mass index (BMI) and physical activity levels among students. Their findings suggest that while additional PE time increases the frequency with which students engage in vigorous or strength-building activities, it does not significantly affect BMI or the likelihood of students being overweight.

Specifically, the comparison of BMI between experimental and control groups showed no significant differences in pre-test and post-test measurements. The authors note that significant changes in height and weight indicators within a 10-week period of physical fitness practice are unrealistic and unscientific.

2. 50meters: There are researchers investigated the impact of an innovative teaching-learning method on students' physical fitness, specifically focusing on speed as measured by the 50-meter sprint test. Their results indicate significant improvements in speed for both boys and girls in the experimental group, as evidenced by pre-test and post-test comparisons ($p < .05$). (Ernazarov & Mavlonova, 2022) Additionally, when comparing the experimental group to the control group, significant differences were observed in the post-test scores ($p < .05$). These findings suggest that the innovative teaching-learning method effectively enhanced students' speed.

3. Standing long jump: Evaluated the impact of an innovative teaching method on strength performance using the standing long jump test. Their study found that the strength performance of students improved significantly compared to traditional physical education methods. (Porter et al., 2010). Specifically, the experimental group showed significant improvements in standing long jump performance from pre-test to post-test for both boys and girls ($p < .05$). Additionally, significant differences were observed between the experimental and control groups in the post-test scores ($p < .05$). These results highlight the effectiveness of the innovative teaching method in enhancing students' strength, making the jump test a valuable tool for strength and physical training professionals.

4. Sit forward: There are researchers investigated the impact of a 1-minute stretching program on school children's flexibility, measured by the sit-forward test. Their results indicate that while the stretching program significantly improved flexibility in both boys and girls from pre-test to post-test ($p < .05$), the improvements were not sustained after a detraining period, with scores reverting to initial levels. (Merino et al., 2015) When comparing the experimental group to the control group, there were no significant differences in post-test scores. Although the mean values for flexibility performance improved slightly, the changes were minimal. The study suggests that the duration and frequency of exercise play a crucial role in achieving lasting flexibility gains.

5. 12 minutes running: They explored the impact of endurance teaching practices on students' running performance using a 12-minute running test. (Severin et al., 2021) The study found that, compared to the control group, the experimental group showed significant improvements in endurance for both boys and girls ($p < .05$) from pre-test to post-test. However, when comparing the experimental group to the control group, boys showed no significant difference in their scores, while girls demonstrated significant enhancement ($p < .05$). This indicates that girls in the experimental group benefited more from the endurance teaching methods than boys. The study observed that both control and experimental groups saw improvements in physical fitness over ten weeks, but the experimental group showed more substantial gains in speed, endurance, and strength.

6. Experimental and control groups: There are researchers investigated the impact of high-level physical education programs on students' physical fitness compared to their peers with standard physical education. Their study found that students who participated in high-level physical education programs demonstrated greater physical fitness than those who did not have this experience. The research highlighted the significant contribution of teaching dimensions to enhancing students' physical fitness. (Chen et al., 2016) Before the experiment

began, a pre-test of physical fitness was conducted for both the experimental and control groups. The results showed no significant differences in physical fitness across five test items, indicating that both groups had similar fitness levels at the outset. This lack of initial difference supports the reliability of the subsequent experimental results.

7. Experimental group: Other researchers found that physical fitness can be significantly improved through physical education and sports, particularly in the areas of speed and strength. (Talaghir et al., 2018) After ten weeks of physical education, students' overall physical fitness showed notable enhancement. Comparisons between the experimental group and the control group revealed that the experimental group, which utilized an innovative integrated teaching method, demonstrated significant improvements in physical fitness. The study supports the effectiveness of this innovative teaching method in enhancing students' physical fitness, indicating that such methods are practical and beneficial for implementation in physical education programs.

8. Control group: The impact of teacher communication on students incremental ability beliefs, intrinsic motivation, and performance in physical education. Their results indicated that in the control group, there was only a slight improvement in physical fitness, suggesting no significant difference. This minimal improvement was attributed to the monotonous and singular nature of the control group teaching approach, which led to lower student enthusiasm and weaker motivation for physical education. The study underscores the importance of engaging and varied teaching methods to enhance students' motivation and performance in physical education. (Moreno et al., 2010)

In compare the experimental group and the control group, the study found that the experimental group adopted integrated physical education teaching innovations methods, which had more obvious enhance in speed, endurance and strength. This enhance is particularly notable. The implement of this integrated physical education teaching innovations approach to significant improve in physical fitness students. The findings suggest that in this school setting, the integrated physical education teaching innovations technique is a viable and successful means of enhancing physical fitness.

Conclusion

An analysis and comparison of students pre and post-test results on physical fitness can be summed up as follows:

1. A teaching-integrated plan was created to improve students' physical fitness in higher vocational colleges in Kunming, City after pertinent materials were reviewed and existing literature was summarized. Physical fitness students significantly improved after this integrated physical education teaching innovations approach was implemented, indicating that the integrated teaching method is practical and effective for enhancing physical fitness in this educational setting.

2. The data analysis results show that after ten weeks of using integrated physical education teaching methods, students in the experimental group showed significant improvement in physical fitness. Specifically, the experimental group showed improved performance in several fitness tests: 50-meter sprint, standing long jump, sit-and-reach, and a 12-minute run, with post-test scores significantly better than pre-test scores ($p < .05$). Improvements were found in speed, strength, flexibility, and endurance. The Body Mass Index

(BMI) showed minimal change, which was expected given the relatively short ten-week experiment's duration. It may not have taken this long to observe meaningful variations in BMI.

3. In compare the experimental and control groups, the study found that the experimental group, which integrated physical education teaching innovation methods, showed more pronounced gains in speed, endurance, and strength. This improve is particularly noteworthy given that the experimental group focused on physical fitness aspects relevant to their major and future careers. The enhanced physical fitness in the experimental group aligns well with their professional needs, suggesting that the integrated teaching methods not only improved general fitness but also addressed specific career-related physical demands effectively.

Suggestion

The suggestions from the study are as follows:

1. Suggestions for this research

Students in the experimental group saw a considerable improvement in their physical fitness after ten weeks of using integrated physical education teaching innovation approaches. This implies that implementing integrated physical education teaching innovation approaches in physical education courses can be advantageous for higher vocational colleges. These methods can support the achievement of learning objectives and provide a more stimulating and joyful learning environment for students.

2. Suggestions for further studies

1) Extend the Experiment Duration: The implementation of integrated physical education teaching innovation methods should continue beyond the current ten-week period. Lengthening the experiment cycle will allow for a more comprehensive assessment of its long-term effects on physical fitness students.

2) Extend the Study's Scope: Future investigations should extend the study's reach by implementing innovative integrated physical education teaching strategies in a greater number of higher vocational colleges.

Limitation

1. During the testing process, it cannot be guaranteed that all students fully cooperated with the teaching and physical fitness assessments. This inconsistency in participation may reflect a shortfall in comprehensive research.

2. The study conducted at Yunnan Vocational College of Tourism presents certain regional limitations. Specifically, the findings may not be generalizable to higher vocational colleges in other regions due to the unique characteristics and context of this institution.

3. The limitations inherent in individual research and varying cognitive levels among participants may also influence the outcomes of this study.

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