

Practice of "Mutual Aid" Teaching Mode in College Table Tennis Teaching

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Abstract: Known as the "national ball", table tennis is one of the key projects in my country's competitive sports. It has become one of the main fitness and entertainment items for the public in my country. Therefore, in the public physical education classes of colleges and universities, table tennis teaching always occupies a place. The main purpose of this paper is to analyze and study the application of "mutual aid" teaching mode in college table tennis teaching practice. This paper mainly sets up different group comparison experiments through systematic sampling method. The experimental results show that under the influence of "mutual aid" teaching, more than 60% of the students in the experimental group are willing to play table tennis after one year, while 75% of the students in the control group are willing to play table tennis again. I don't want to play table tennis anymore.

1. Introduction

Table tennis has become a popular college sports elective project because of its quick start, easy access to venues, cheap equipment, low physical requirements, strong interest, and outstanding cultural and idol effects. With the changes in the diversity of college students, the reform of table tennis teaching has also become a field that many physical education teachers are striving to explore and seek new [1-2].

In their research on teaching model methods, Lee et al. argue that our society is inextricably linked to the Internet. Communication education in universities also needs to be linked to online education [3]. Interaction between teachers and learners can also lead to higher educational outcomes when aligned with online systems. Viana aims to discuss continuing education and teaching for teachers facing new technologies. concluded that teaching practices should increase the value of relational and cognitive processes in a school setting that treats teachers and students as subjects of learning [4]. To this end, continuing education must be viewed as a necessity that provides teachers with a greater sense of security against the challenges inherent in this new educational environment.

This paper is mainly based on the application of "mutual aid" teaching in table tennis teaching practice, using systematic sampling, setting up experimental groups and control groups, through

teaching experiments, combined with psychological measurement and questionnaire surveys and other research methods to investigate the "mutual aid" Teaching affects the improvement of students' basic skills, the improvement of learning interest and learning ability, the maintenance of exercise habits, the improvement of interpersonal skills, the improvement of self-efficacy, and the growth of personality and other factors. The conclusion is that: "mutual aid" teaching has a significant effect on improving the academic performance of basic skills, learning enthusiasm and self-learning ability; it has a positive meaning on the development of lifelong sports habits; it has a positive meaning on improving self-efficacy and personality cultivation; positive meaning.

2. Research on The Design of "Mutual Aid" Teaching Mode in College Table Tennis Teaching

2.1 The Concept of "Mutual Aid" Teaching

(1) Interactive view

Among the many concepts of "mutual aid" teaching, the first one is its interactive view. At present, our country's teaching practice is far from the real interactive view that emphasizes the ability of students to take the initiative to absorb knowledge. In such an interaction, it is difficult for students to effectively guide and stimulate their active thinking, and students do not get the respect they deserve, and it is easy to generate negative emotions. The "mutual aid" teaching focuses on the effective development and utilization of the interaction between the whole staff, and regards the interaction between students and students as an equal relationship with the interaction between teachers and students, forming a multilateral interaction [5-6].

(2) Goal view

Mutual-aid teaching is a goal-oriented activity. For this goal-orientation, the first is goal-oriented, and there is more and broader tolerance for ways to achieve goals; the second is the question of what kind of goal-oriented. In the multilateral interaction of "mutual aid" teaching, the communication between students plays a role of supervising and stimulating, and also effectively makes up for the problem that the strength of one teacher is not enough to take care of the thinking of the whole class. "Mutual aid" teaching in various forms of group activities not only develops students' ability of expression and communication, but also shapes harmonious and friendly classmate relationships; it is not only full of competition and challenges, but also cooperates and cooperates; The need to influence others is met by providing help, and the need to belong is met by caring for each other.

(3) Views of teachers and students

The essence of "mutual aid" lies in equal interpersonal relationships. Only on the basis of equal interpersonal relationships can we work together and inspire each other. This equality is not only equality between teachers and students, but also equality between students. The concept of equality between teachers and students is the key to the realization of "mutual aid" teaching. Teachers should make students clear the learning goals, the use of knowledge, and the correlation between knowledge points, so as to help students better construct knowledge systems, and students themselves pursue the integrity of the knowledge system to form the motivation for learning. In this kind of interpersonal relationship, teachers and students should be able to empathize well, be able to understand the expectations, wishes, and desires of both parties, and be able to provide mutual support in a timely manner [7-8].

(4) Form view

"Mutual aid" teaching and teaching organization form is an important content of teaching method. The "mutual aid" teaching method pays more attention to the construction of real cooperative situations, and creates an environment that can maximize the benefits for students'

cooperative learning. This environment is based on cooperation, but does not exclude competition and solo work, because effective competition motivates individuals to perform at their best, while solo work when necessary may bring the greatest benefit to the collective. In addition, the "mutual aid" teaching method seeks to select people with different personalities, abilities, and personalities to form a team as much as possible when grouping. These unique members can bring richer information, urge members to learn from each other's strengths, and increase group activities. diversity and inspire more perspectives.

(5) Evaluation view

The evaluation concept of "mutual aid" teaching method is its biggest reform highlight. At present, most teaching evaluation systems in our country are norm-referenced evaluations, with rankings and scores as the only criteria for evaluating individual learning effects, with obvious limitations, no internal incentives, and no sense of self-meaning. On the contrary, the "mutual aid" teaching changes the norm-referenced evaluation into the standard-referenced evaluation, takes the group's overall performance as the basis for recognition, and on the basis of the overall evaluation, measures individual progress and respects the "life-to-life evaluation", which makes the evaluation broader, More respect for the real situation of the individual. The direction of students' efforts is therefore positioned in striving for continuous improvement and improvement. As long as there is progress compared with the past self, even if the goal is achieved, it reflects the fairness and practicality of evaluation [9-10].

2.2 The Problems Faced By the General Table Tennis Course in Colleges at This Stage

(1) The number of class hours for general courses is small. The number of class hours of the general table tennis course of the college has undergone several changes in four stages: from 72 credit hours, 54 credit hours, 36 credit hours in the past, and now 48 credit hours. In the technical teaching of the general table tennis course, teachers should not only let students understand, experience and master a single table tennis technique and its combination within a limited classroom time, but also need to run through the technical principles, competition principles, competition rules and competition rules. On-site referee theory and practical study, the past 72 credit hours were a little nervous, but now the 48 credit hours seem to be difficult.

(2) The number of students in general courses is large. In the limited classroom time, teachers should not only arrange the classroom content according to the physiological activity rules of the preparation part - the basic part - the end part, but also follow the cognitive rules. It is undoubtedly a complex process that is time-consuming and labor-intensive. On the one hand, it is the continuous improvement of teaching objectives and social requirements; From the beginning of learning, it is possible to master the standardized movement method, which requires the study of new teaching methods to deal with the above problems.

(3) The motor skills of modern students are generally worse than those of past students. Due to the examination-oriented education formed around the enrollment rate in our country, the number of primary and secondary school students participating in physical exercise or sports specialty training has dropped significantly compared with the past, and the sports quality and sports skills of students are also significantly worse than those of the past. This brings difficulties to the teaching work of physical education colleges [11-12].

2.3 Algorithm Research

(1) Model training

Different models are trained by minimizing the loss function on the training set. Specifically as shown in formula (1):

$$L(Y, P(Y | X)) = -\frac{1}{N} \sum_{i=0}^{N-1} \sum_{m=0}^{M-1} y_{i,m} \log p_{i,m} \quad (1)$$

In the formula, L represents the loss function, X represents the input variable, and Y represents the output variable.

(2) Evaluation method of classification algorithm

The specific calculation method of precision rate, recall rate and F1 value is as follows:

1) Accuracy rate, the specific calculation is as follows:

$$P = \frac{TP}{TP + FP} \quad (2)$$

TP is the positive class prediction and FP is the negative class prediction.

2) The recall rate is calculated as follows:

$$R = \frac{TP}{TP + FN} \quad (3)$$

TP is the positive class predicted by the positive class, and the other is the negative class predicted by the FN positive class.

3) The F1 value represents the model harmonic average, and the specific calculation is as follows:

$$F_1 = \frac{2PR}{P + R} \quad (4)$$

P is the precision rate, R is the recall rate, the minimum is 0, and the maximum is 1.

3. Practical Research on "Mutual Aid" Teaching Mode in College Table Tennis Teaching

3.1 "Mutual aid" Teaching Experiment

Table 1. Comparison of forehand and backhand hits between the two groups before the experiment (N=64)

	group	n	male	Female	Age ($\bar{X} \pm S$)	Grades ($\bar{X} \pm S$)	T value	P
backhand push	test group	32	16	16	20.5±1.5	5±0.78	0.68	<0.5
	control group	32	17	15	20.4±1.6	5±0.76		
forehand	test group	32	16	16	20.5±1.5	18±0.56	0.76	<0.5
	control group	32	17	15	20.4±1.6	18±0.59		

This paper mainly takes the effect of "mutual aid" teaching in the teaching of table tennis elective courses in colleges and universities as the research object, and explores the effect of different teaching methods on students' skill learning and fitness habits. A total of 64 students who took table tennis as an elective were selected as the experimental subjects, and the samples were sampled in layers. Based on the results of the forehand attack test and the backhand push test, the specific data are as follows Table 1:

After a semester of 32 hours of teaching, the comparison of forehand and backhand performance between the experimental group and the control group is as follows Table 2:

Table 2. Comparison of forehand and backhand hits between the two groups after the experiment (N=64)

	group	n	male	Female	Age ($\bar{X} \pm S$)	Grades ($\bar{X} \pm S$)	T value	P
backhand push	test group	32	16	16	20.5±1.5	50±2.6	2.75	<0.01
	control group	32	17	15	20.4±1.6	41±5.1		
forehand	test group	32	16	16	20.5±1.5	55±1.9	1.87	<0.1
	control group	32	17	15	20.4±1.6	48±3.8		

It can be found that the two groups have made great progress in the two basic techniques of forehand attack and backhand block, and the average value of the two groups is similar, especially in the forehand attack technique. This is in line with the basic teaching rules. But the difference between the two is shown in: whether it is a forehand attack or a backhand push, the standard deviation of the experimental group is significantly smaller than that of the control group. In the experimental group, the grades of the students were more similar, the difference within the group was smaller, and the progress made was comparable, and most of the students made great progress. In the control group, the difference within the grade is relatively large, which means that the progress made by the students is very different. Some students have better grades, and some students are obviously lagging behind. This is also the diversity of students in teaching. The inevitable result of not being effectively controlled.

After hypothesis testing, in the forehand attack technique, the T value was 1.87, $P < 0.1$, and the difference was significant; in the backhand push technique, the T value was 2.75, $P < 0.01$, and the difference was very significant.

3.2 Comparison of Differences in Sports Situational Interest

Physical education class is a specific situation, and situational interest plays an important role in stimulating students' motivation to study physical education. Based on this, the "Sports Situational Interest Scale" was developed using the contextual interest test theory of contrasting environments and the 7-factor structure. details as follows Table 3:

Table 3. Comparison of differences in sports situational interest between the experimental group and the control group (N=64)

dimension	test group($\bar{X} \pm S$)	control group($\bar{X} \pm S$)	T value	P
Novelty (N)	17±1.65	15±3.42	1.97	<0.1
Challenging (C)	13±2.1	14±2.9	-1.35	—
Attention (AD)	17±1.95	18±1.86	-1.09	—
Exploratory (EI)	16±1.86	10±6.45	2.17	<0.01
Pleasure (IE)	18±1.74	11±7.3	2.09	<0.01
Overall Interest (TI)	17±1.63	12±7.21	3.01	<0.01

Analysis of Table 3 shows that there are significant differences between the two groups in the dimension of novelty; the differences in exploration, pleasure, and overall interest are very obvious; there is little difference in challenge and attention. It shows that on the cognitive level, both groups can recognize the positive effect of table tennis practice on the cultivation of individual attention, which is helpful for individuals to obtain good cognitive ability, and they do not feel that table tennis practice is particularly challenging and difficult to cope with. However, due to the difference in cooperation and emotional investment among students in actual teaching, they experience different degrees of pleasure, so they show very significant differences; and because of the process of sharing and seeking knowledge among students, so that the two groups of students feel different exploratory, there are very significant differences; and in the overall interest, there are also obvious

differences.

Judging from the measurement results of the Sports Situation Interest Scale, the students in the experimental group were more actively involved in the learning of table tennis skills and enjoyed it. This kind of positivity, on the one hand, is reflected in the observation of teachers in the classroom, the number of students in the classroom mixed with standing classes has decreased significantly. On the other hand, in "mutual aid" teaching, students are led by questions to explore answers independently through communication, watching videos and other means, and the process of solving problems also effectively enhances students' ability to learn independently. The reason is that the use of cooperative teaching method in table tennis class satisfies young students' strong curiosity to explore the unknown and their desire to improve themselves. People are always in pursuit of making up for the vacancy of knowledge, constantly improving themselves, and constantly sublimating from a sense of uncertainty to a sense of certainty. Therefore, an activity that allows participants to feel that they are constantly changing in it can motivate participants to continue to make efforts to stick to it.

4. Practical Analysis of "Mutual Aid" Teaching Mode in College Table Tennis Teaching

4.1 Analysis of University Table Tennis Learning

The following table is the statistics of the number of people who have taken physical education courses in a certain institution in recent years Table 4:

Table 4. Statistics of the number of elective PE courses in a certain institution in recent years (N=3717)

Project school year	Pingpong	Basketball	Aerobics	Volleyball	Martial arts	Badminton	Football
1	411	307	241	/	37	41	163
2	389	203	169	37	81	112	124
3	425	267	198	/	76	309	127
Total	1225	777	608	37	194	462	414

As can be seen from Figure 1, table tennis has always been very popular, and the number of elective table tennis students in this college has always been the largest. Among the total number of 3717, the number of electives in table tennis accounted for 1225, which is exactly one-third of the total number.

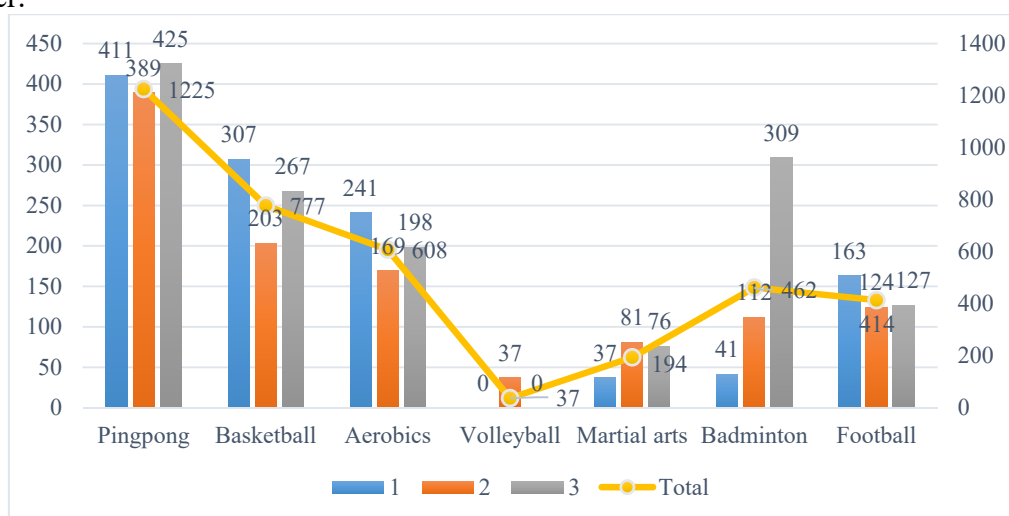


Figure 1. Analysis of the elective situation of special physical education courses

4.2 Survey on Willingness to Stick to Table Tennis

The following table shows the results of the survey on the willingness of the students in the experimental group and the control group to stick to table tennis Table 5:

Table 5. The survey results of the willingness to stick to table tennis between the two groups (N=64)

Are you willing to keep this exercise habit?	test group(n=32)		control group(n=32)	
	half a year(f)	one year(f)	half a year(f)	one year(f)
willing	22	20	13	8
uncertain	8	10	10	7
unwilling	2	7	9	17

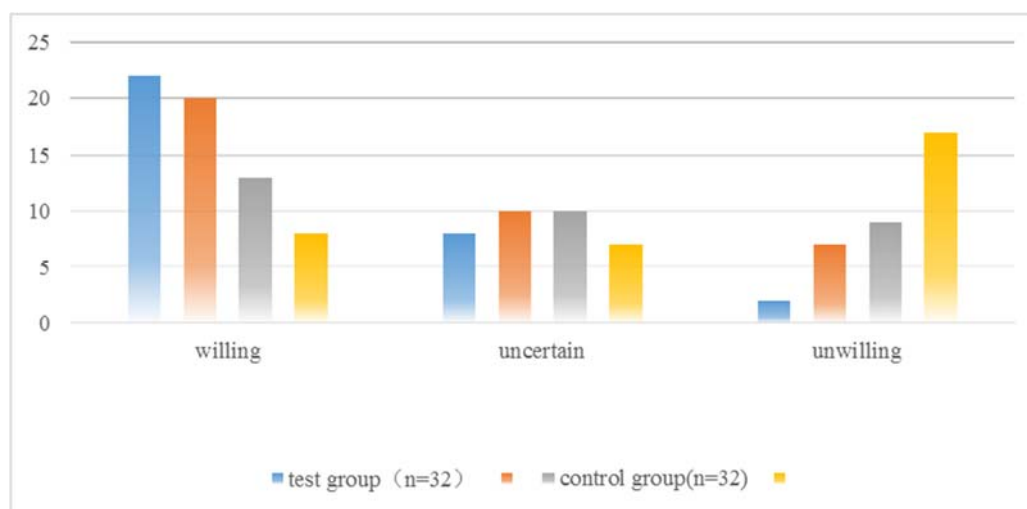


Figure 2. Analysis of students' willingness to stick to table tennis

As can be seen from Figure 2, Through a survey on the willingness of two groups of students to stick to table tennis, it was found that most of the students in the experimental group were willing to stick to the sport, and their interest gradually declined; while in the control group, one year after the end of the course, more than half of the students did not I would like to play table tennis again. Interviews were conducted with the students who chose the column of "uncertain", and combined with the data of each subject, it was concluded that in the experimental group, the students were subjectively willing to go, but they were restrained by other things and did not insist on going; The control group is often unwilling to go subjectively, but sometimes out of love, they also go with friends. This also fully demonstrates the advantages of "mutual aid" teaching.

5. Conclusions

The traditional teaching model pays little attention to the students' spirit of self-exploration, and teachers are generally not enough to analyze the individual differences of students. Today, in addition to sports skills, physical education in colleges and universities should cultivate students' interpersonal skills, cooperative awareness, and sound personality, so as to truly exert the "educational" value of sports. "Mutual aid" teaching is an inevitable product of the development of the world's intellectual history, and it ultimately embodies the humanistic thought that integrates educating and imparting knowledge. This paper uses a combination of teaching experiments and questionnaires to demonstrate that "mutual aid" teaching can effectively improve students' skill learning effect, learning interest, and learning ability. The relationship between the improvement of

self-efficacy and the cultivation of personality is expounded, and strives to make the teaching fit the educating nature of sports and show the charm of sports.

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