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Research on SPSS T test-based goal orientation teaching method efficiency in badminton teaching

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ABSTRACT

Badminton is a kind of popularized event, is well-received by people, in Chinese universities, they also have badminton public optional courses, due to training time is short, the courses let learners learning efficiency to appear underperforming phenomenon. In order to let badminton public course to get systematization and professionalization, the paper takes one university two classes' badminton optional course learners as research objects, designs oriented goal teaching method and traditional teaching method experiments schemes. And apply SPSS software to make statistical analysis of experiment data, by experiment result, it gets that oriented goal teaching method has larger advantages over traditional teaching method in cultivating students' task oriented level aspect and badminton technical level aspect by comparing, in view of scoring status, experiment class students is obviously superior to control class members.

KEYWORDS

Oriented goal theory; Teaching plan; Badminton; SPSS software; Significant advantages.



INTRODUCTION

Chen Yi-Qin (2012) pointed out that present badminton was developing forwards “fast attack, changeable, comprehensive” orientations, with techniques and tactics levels constant promotion and each team level approximates, competition fighting was quite fierce^[1]. Badminton event functions on one hand, it reflects in arena; on the hand reflect in public fitness field, the paper researched badminton event is mass fitness field teaching methods. In order to let learners to get system learning, let them to reduce sports injury in moving process, promote sports techniques, the paper researches oriented goal teaching method applied efficiency in badminton teaching.

For badminton teaching and learning researches, lots of people have made efforts, just their efforts, let the event to achieve more extensive audiences group, it builds certain base for masses fitness and national fitness development. Among them, Xu Mei-Hua (2012) combined with author years’ badminton teaching actual combat experiences, summarized a set of badminton chopping technique teaching methods, and tried to briefly discuss badminton chopping technique application in competition^[2]. Sun Hua etc.(2012) started from author actual combat experiences, went deeper into analyzing badminton technical and tactics training contents and methods^[3].

The paper on the basis of formers research, for universities badminton optional course teaching methods, it makes research, designs goal orientation teaching method teaching plan, by teaching experiment method, it researches goal orientation teaching methods superiority by comparing to traditional teaching method, in the hope of providing theoretical references for badminton techniques professionalization popularization and teaching.

GOAL ORIENTATION TEACHING METHOD SUMMARY

Goal refers to one specific behavior criterion that a person tries to achieve in one specific time^[4]. In view of history, goal refers to human all behaviors destination, is people established link for more clearly recognizing things movement and development. In one significance, goal is most direct motivation to trigger behaviors, set proper goal will let people to generate honor demands to arrive at the goal, therefore it has fiercely stimulation effects on people.

By far, relative theories in sports field, it mainly has mechanism and cognitive theory two kinds, as following shows:

Locke&Latham (1990) put forward mechanism thought that goal setting influences on sports activities mainly reflect in guidance quality, motivating individual behaviors, propelling to efforts and helping task completion four aspects^[5].

Burton (1992) proposed cognitive theory mainly highlighted goal was related to motivation, self-confidence and anxiety^[5].

Nicholls pointed out that people went in for all kinds of achievement activities purposes was to promote or display individual ability, acquire sense of qualification, every people had different opinions on ability, his judgment and evaluation qualification force criterion would also be different, in achievement situation, there were two kinds of main goal orientations or people subjective determined success main base, one kind was task orientation, the other was self-orientation. Dweck called Nichiolls proposed two kinds of goal orientations was learning goal orientation and performance goal orientation, Ames called the two kinds grasping goal orientation and performance goal orientation^[6].

Elliot and others advocated to classify goal orientations into three items, that was rule of thirds^[7], Elliot and Pintrich on the basis of trichotomy, proposed quartering^[8]. As TABLE 1 show.

TABLE 1 : Trichotomy and quartering concrete expression table

Method	Classification	Concrete expression
Trichotomy	Grasp goal orientation	In case such goal orientation, individual focuses on grasping tasks, developing ability, acquiring a kind of self-referencing-based feeling of competence.
	Get closer to goal orientation	In performance-approximate to goal, individual focuses on how to get good results, cares about feeling of competence that compares to others and good ability evaluation.
	Avoid goal orientation	In case performance-avoiding goal, individual focuses on how to avoid ability evaluation that is bad for it, avoids failure.
Quartering	Grasping-approximate to goal orientation	Individual focuses on mastering task, learning and understanding, according to self-progress and task understanding depth to evaluate self-performance.
	Performance-approximate to goal orientation	Individual focuses on how to surpass others, show himself to be the cleverest, the best, according to norm standard, he evaluates self-performance, such as examination result is the best in class.
	Grasping-avoiding goal orientation	Individual focuses on how to avoid cases that cannot understand or grasp tasks, judge success criterion is correct fulfilling tasks on the basis of self-comparison.
	Performance-avoiding goal orientation	Individual focuses on how to not himself to be reflected as inferior, stupid than others, evaluates self-performance according to norm standards, such as examinations results is not the worst in class.

Lian Rong and others in senior high school students achievement goal inclination and mental health status relations research, pointed out that purely divided goal orientations into task orientations or self-orientations two independent type was improper, because the two kinds of goal orientations generally their motivations on the same thing had no differences, only

had levels differences^[8], as TABLE 2 showed emotion, cognition and behaviors three aspects discussion two goals motivations effects differences.

TABLE 2 : Two kinds of goal orientations motivations and cognition result table

	Task orientation	Self-orientation
Attributes to winning or losing	Winning or losing attributes to whether making efforts or not, it is thought that result is up to personal efforts conditions	Winning or losing attributes to ability, it is thought that result is up to self-innate ability.
Emotion	Feel satisfied with feeling of achievement after making efforts, feel guilty of not making sufficient efforts, own positive attitudes towards learning;	Care for comparing to others, feel that being stronger than others is success; it is easy to generate anxiety and be afraid of failure.
Cognition	It is thought that there are no differences among people, difference is whether making efforts or not, goal completion is unrelated to others	Regard surpass others as success, even regard others errors as self-success, it is thought that spending more efforts than others means self -ability is low, so is unwilling to make efforts.
Behaviors	No matter what personal ability is, will select more challenging tasks, adventurous, despite of difficulties, and work harder	Select easy tasks, unwilling to risk, or select more difficult tasks, and use it as excuse of failure, effort extent is lower, lack of durability.

RESEARCH OBJECTS AND RESEARCH METHODS

Research objects

The paper random selects two classes from one university grade 2012 badminton public sports classes, from which one class is experimental class, it adopts goal orientation teaching method, the other class is control class, it adopts normal teaching method. Experimental class students are totally 36 people, schoolgirls are nine while schoolboys are 27, control class total amounts and proportions of genders are completely the same as experimental class.

Research methods

Experiment method experiment steps are as following

(1) Preparation link: Firstly carry out task orientations and self-orientations test on two classes research objects, experimental class and control class students are both selecting badminton course in the first term, original level distributions are the same, and arrange a same teacher to teaching two natural classes, two classes teaching contents are the same, but teaching methods are different.

(2) Experiment process: the process divides into students participate in goal selection and make goal commitment, teaching organization methods selection and timely provide feedback information, from which experiment class teaching organization process is as Figure 1 shows.

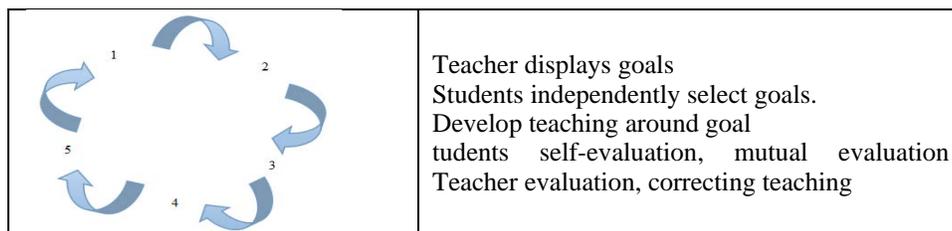


Figure 1 : Experiment class teaching organization process

Locke and others thought that timely feedback information and reward could provide relative self-efficacy information for individuals, and then encouraged individuals to work harder, so guided students to arrive at task-oriented goal, but to avoid damaging students' learning internal motivations, when providing feedback and reward, it should highlight feedback information functions, highlight the purposes of providing feedback is to let individuals to understand their achieved performances and learning schedules status to provide a reference for next step activities contents and orientations, when students appeared inadaptation in goal learning, provided information feedback on students adjusting self-learning strategies, by these feedbacks, students could better carry on independent learning and then better complete teaching goal^[10].

The paper takes experiment method as subject, applies SPSS to make mathematical statistics analysis of experiment data, in preparation link's task orientations and self-orientations levels research, adopts questionnaire survey, totally releases 72 pieces in experimental class and control class two classes, from which 36pieces are for experimental class, and 36 pieces for control class, return rate is 100%, by consulting two classes scores average value, standard deviation, t test value and significance probability, it reflects two groups of members levels.

In teaching effects evaluation process, required evaluation contents are as TABLE 3 shows.

TABLE 3 : Teaching efficiency evaluation table

Evaluation item	Evaluation content	Score criterion
Learning attitude	Attendance status	Totally ten points, deduct two points when absent per one time, the ones that absent 5 times and above will be cancelled rights of examination.
	Class performance	Totally ten points, whether learning attitudes are positive and serious or not, whether striving to train or not, they are evaluated by students' self-evaluation, group mutual evaluation and learning notes
	After-class exercises	After-class training cards record conditions, totally 10 times and 20 points, deduct 2 points when lacking per time. Qualified requirement: Two person plays every one rally will get 1 point, 10 points are full score.
Technical measurement	Forehand clear	Stroking techniques evaluation:10points-technical motions are smooth, normative, grasp singles competition rules, in competitions, used technical motions are reasonable, tactics are properly applied, progress range is large ;8~9points-technical motions are smooth, correct, basically grasp singles competition rules, techniques and tactics are well applied, progress is relative remarkable;6~7points - technical motions are correct, have certain knowledge about singles competition rules, can apply some techniques and tactics, have certain progresses ;4~5points – technical motions are basically correct, techniques and tactics awareness is stronger, progress range is not remarkable ;2~3points- technical motions are normal, don't know apply techniques and tactics, have no progress. Qualification requirement:Require ball landing point to be between front service line and net, one ball obtains two points.
	Forehand drop	Stroking techniques evaluation:10points- technical motions are smooth, normative, grasp singles competition rules, in competitions, used technical motions are reasonable, tactics are properly applied, progress range is large ;8~9points-technical motions are smooth, correct, basically grasp singles competition rules, techniques and tactics are well applied, progress is relative remarkable;6~7points - technical motions are correct, have certain knowledge about singles competition rules, can apply some techniques and tactics, have certain progresses ;4~5points – technical motions are basically correct, techniques and tactics awareness is stronger, progress range is not remarkable ;2~3points- technical motions are normal, don't know apply techniques and tactics, have no progress.
Physical quality	Men1000meters, women800meters Standing long jump	Score according to "Chinese students' physical health scoring table" regulations

Independent sample T test principle and steps are as following:

T test is used for measurements statistics on two different overall average values, with an aim to judge tested whether two independent samples derive from same average value entirety or not, if it tests on two groups of samples statistics, it should meet following three requests:

- (1) Tested two groups of samples are mutual independent from each other, no matching relationships;
- (2)Two groups of samples all derive from normal entirety;
- (3)Average value is significant descriptive statistics on testing.

When two groups of independent samples meet above three demands, next step should enter into T test actual operation steps, T test operation steps are as following show

STEP1. Establish original hypothesis and alternative hypothesis

Two independent samples T test original hypothesis H_0 represents two entireties average values have no significant differences, mathematical expressions are as formula (1) show

$$H_0: \mu_1 - \mu_2 = 0; H_1: \mu_1 - \mu_2 \neq 0 \tag{1}$$

In formula (1), μ_1 and μ_2 respectively represents the first entirety average value and the second entirety average value.

STEP2. Select test statistics

For two entirety average value difference deduction basis is two entirety samples average value difference, which adopts two groups of samples average value differences estimated entirety average value difference, at this time it should focus on two samples' average value sampling distribution, if two entireties distribution are respectively $N(\mu_1, \sigma_1^2)$ and $N(\mu_2, \sigma_2^2)$, then two samples average value differences sampling distribution is also normal distribution, its average value is $\mu_1 - \mu_2$, variance is σ_{12}^2 , but in different conditions, σ_{12}^2 has different calculation ways, when the two conditions are respectively $\sigma_1 = \sigma_2$ and $\sigma_1 \neq \sigma_2$, the former represents two entireties variance are unknown and equal, the latter represents two entireties' variance are unknown and not equal, therefore the former can adopt combined variance as two entireties variance estimation, their mathematical definitions are as formula (2) show

$$Sp^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \quad (2)$$

In formula (2), S_1^2 and S_2^2 are respectively the first group of samples variance and the second group of samples variance, n_1 and n_2 respectively represents the number of first group of samples and the number of second group of samples, then at this time two samples average value difference sampling distribution variance σ_{12}^2 is as formula (3) show:

$$\sigma_{12}^2 = \frac{Sp^2}{n_1} + \frac{Sp^2}{n_2} \quad (3)$$

The latter case, it needs to respectively adopt their own variance, at this time two samples average value difference sampling distribution variance σ_{12}^2 can be calculated by formula (4)

$$\sigma_{12}^2 = \frac{S_1^2}{n_1} + \frac{S_2^2}{n_2} \quad (4)$$

Therefore two entireties average value differences test statistics mathematical definition is as formula (5) show

$$T = \frac{\bar{X}_1 - \bar{X}_2 - (\mu_1 - \mu_2)}{\sqrt{\sigma_{12}^2}} \quad (5)$$

In case $\sigma_1 = \sigma_2$, T statistics conforms to $(n_1 + n_2 - 2)$ pieces of freedom degrees t distribution, in case $\sigma_1 \neq \sigma_2$, it conforms to revised freedom degree t distribution, revised freedom degree mathematical definition is as formula (6) show

$$f = \frac{n_1 n_2 (n_2 S_1^2 + n_1 S_2^2)^2}{n_2^3 S_1^2 + n_1^3 S_2^2} \quad (6)$$

STEP3. Calculate testing statistics observation value and probability P value

The purpose of the step is calculating F statistics and T statistics observation value and their corresponding probability P value, applies SPSS software, it can automatically get F statistics and probability P value according to single factor variance analysis, and can automatically input two groups of samples average value, numbers of samples and sampling distribution variance into formula (5), it gets T statistics observation value and corresponding probability P value.

STEP4. Given significance level α , and makes decision

At first, make use of F test to judge two entireties variance is equal or not, and according to two variances numerical relationships, it decides sampling distribution variance and freedom degree calculation method and result, if F testing statistics probability P is less than significance level α , then it should refuse original hypothesis, it gets the conclusions that two entireties variance have significant differences, on the contrary, it is thought that two entireties variances have no significant differences.

Then, it applies T test to judge whether two entireties average value exists significant differences or not, if T test statistics probability P value is less than significance level α , then it should refuse original hypothesis, it gets two entireties average value has significant difference, on the contrary, it is thought that two entireties have no significant differences.

At last, according to statistical objects differences, it gets corresponding conclusions.

TEACHING GOAL ESTABLISHMENT

As TABLE 4, it shows the experimental class badminton public physical education course first term teaching schedule goal.

TABLE 4 : Experimental class teaching schedule goal design table

Class-time	Teaching content	Basic goal	Enhanced goal
	Badminton development general situation		
1	Badminton basic technical rules and referees law racket holding and preparation posture	Learn badminton movement rules Students can master correct racket gripping method and preparation postures	Master competition rules Students can flexible apply racket gripping method and preparation posture
2	Learn forehand clear	1. Forearm fast swinging, wrist waves, control landing point;2. fast swinging racket, whipping, arc being high;3. Reasonable apply paces	1. Service arc being high, landing point being deep; 2.Can try to stroke clear as much as possible in exercising moving
3	Learn forehand clear paces and rhythm Revise forehand service, clear Learn backhand clear	1. Control service landing point in back court, arc being high;2.Can stroke forehand, backhand clear in continuous moving	1.Landing point in the area of backwards 1/4 ; 2. Combine straight line and oblique Motion is normative, application is reasonable;
4	Learn forehand flat clear Learn forehand net front small service	Movement is correct, stroke is fast Learn rules and limit technical motions	Ball drop point gets close to front service line
5	Revise forehand service Learn backhand service	1. Could serve all kinds of forehand service that conforms to rules;2.Could backhand serve clear, flat clear, net small ball	1. Ball speed is fast, application is reasonable 2. Motion is fast, has confusion
6	Revise backhand service Learn forehand drop	Motions are fast, reasonable, normative; 2. Racket swinging is slow, racket leans forward, cut ball base, ball flies to net	1. Consciously control drop point; 2. Motion is smooth, drop point gets close to net
7	Revise forehand drop Learn backhand, head drop	Motion is smooth, drop point lies between net and front serve line; 2.Racket swinging is slower, stroking strength is small, cut base	1.Drop combines with clear 2.Control drop point, flight arc
8	Revise drop Learn lift, chop	1.Drop point lies between net and front service line, oblique reduces;2.Table tennis back court, chop gets closer to net	1.Forehand combines with backhand 2.Lift, drop and chop integrate
9	Revise lift, drop, chop Learn net playing	1.Control strength, control drop point;2.Racket surface turn onwards, hold base, strength is light, land by surpassing net	Lift, drop, chop and net integrate, try to take more rallies
10	Teaching competition (Singles) Revise all kinds of techniques	Flexible, reasonable apply all kinds of techniques	Attack combines with defense, it can strive to initiative for oneself, have tactics awareness
11	Teaching competitions (doubles)	Techniques application is reasonable, has collaboration, and tactics awareness	Have work division, good teamwork, tactics awareness is strong
12	Tactics awareness cultivation teaching competition (free) Revise referees knowledge	Be able to hold the post of referee, linesman, can correct make word of commands and gestures	Require referees and linesman word of commands, gestures to be clearly, correct and timely
13	Middle and long distance running, men1000meters, 800meters Standing long jump	Scoring references: “Chinese students physical health scoring table”	
14	Forehand clear Forehand drop	Two person distance is no less than 10metersstroke clear, 10 rallies full score, technical evaluation full score is 10 points One person serves through medium court, examiner stroking drop point lies between net and front service line, score is five balls to be full score, and technical evaluation full score is 10 points.	

Experimental class technological level enhanced scale table is as Figure 2 shows.

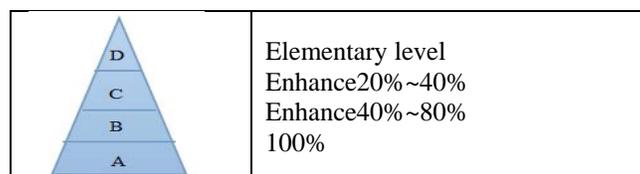


Figure 2 : Technological level enhancing scale table

Traditional teaching model that is intuitional teaching method, control class teaching organization process is as Figure 3 shows.

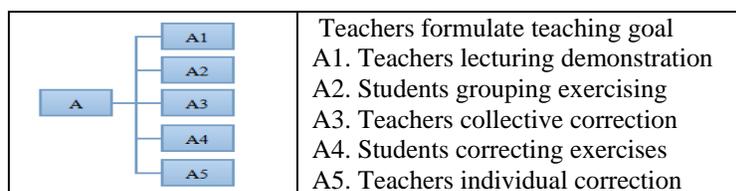


Figure 3 : Control class teaching organization process

RESULT ANALYSIS

Before experiment, experimental group and control group task orientation and self-orientation level T test result is as TABLE 5 shows.

TABLE 5 : Before experiment two groups of students orientation level T test result table

Orientation indicator	Class classification	Sample quantity	Score status	T test value	Significance probability
Task orientation	Experimental class	36	18.47 ± 4.13	0.28	0.67
	Control class	36	18.12 ± 3.23		
Self-orientation	Experimental class	36	15.25 ± 3.34	-1.23	0.24
	Control class	36	16.74 ± 3.64		

By TABLE 5 indicated data result, it can get following showed conclusion:

Before experiment experimental class task orientation average score is 18.47, and control class is 18.12, score difference is 0.35 points, by two classes T test result, it is clear before experiment, two classes of learners task orientation score differences have insignificant significances.

Before experiment experimental class self-orientation average score is 15.25, and control class is 16.74, score difference is 0.51 points, by two classes T test result, it is clear before experiment, two classes of learners self-orientation score differences have insignificant significances.

After experiment, two classes learners task orientation level T test result is as TABLE 6 shows.

TABLE 6 : After experiment two groups of students orientation level T test result table

Class classification	Sample quantity	Score status	T test value	Significance probability
Experimental class	36	20.52 ± 4.41	2.312	0.032
Control class	36	16.88 ± 4.15		

By TABLE 6 data result, it is clear, two groups of students task orientations levels after experiment average score difference is 3.64 points, significance probability 0.032<0.05, it is thought that two group of students have significant differences, in view of scores, experimental class is significant higher than control class task orientation level.

Experimental group students and control group students before and after experiment task orientation levels T test result is as TABLE 7 shows.

TABLE 7 : Two groups learners before and after experiment task orientation level T test result table

Class classification	Before and after experiment	Sample quantity	Score status	T test value	Significance probability
Experimental class	Before experiment	36	18.47 ± 4.13	1.24	0.047
	After experiment	36	20.52 ± 4.41		
Control class	Before experiment	36	18.12 ± 3.23	1.88	0.87
	After experiment	36	16.88 ± 4.15		

By TABLE 7 data result, it can get following showed conclusion:

Experimental class before and after experiment task orientation level average score difference is 2.05points, T test value is 1.24, significant probability is 0.047, the probability value is less than 0.05, evaluation in scores, after experiment experimental class learners task orientation level is obviously superior to before experiment experimental group learners.

Control class before and after experiment task orientation level difference is 1.24points, T test value is 1.88, significant probability is 0.87, the probability value is larger than 0.05, evaluation in scores, after experiment control class

learners task orientation level is lower than before experiment control class learners, due to probability value is larger than 0.05, such difference is thought to be of insignificant significances.

After experiment two groups learners physical quality and technical measurement result T test result is as TABLE 8 shows.

TABLE 8 : After experiment two groups' learners' physical quality and technical test result T test result table

	Item	Class classification	Sample quantity	Score status	T test value	Significance probability
Physical quality	Medium and long distance running	Experimental class	36	1.78 ± 0.865	-1.00	0.163
		Control class	36	1.85 ± 0.745		
	Standing long jump	Experimental group	36	2.20 ± 0.616	-0.49	0.629
		Control class	36	2.30 ± 0.657		
Technical test	Forehand clear	Experimental group	36	2.55 ± 0.605	-2.259	0.036
		Control class	36	1.95 ± 0.759		
	Forehand drop	Experimental group	36	2.80 ± 0.768	-2.698	0.014
		Control class	36	2.20 ± 0.768		

By TABLE 8 data result, it can get following showed conclusion:

From T test result, after experiment experimental class and control class learners physical quality items' medium and long distance running have no significant difference, similarly in standing long jump, it also doesn't have significant difference. In view of scores, for medium and long distance running event and standing long jump event, experimental class is slightly lower than control class physical quality level.

In view of technical test result T test result, experimental class and control class both have significant differences, and experimental class learners technical level is significantly higher than control class learners.

CONCLUSION

The paper on the basis of reviewing goal orientation teaching method, provides research objects and research methods, establishes orientation goal teaching plan and traditional normal teaching plan, by teaching experiment and mathematical statistical method, it gets following showed conclusions:

Before experiment, carry out task orientation and self-orientation level test on research objects, test results indicate that two classes have insignificant differences that they are fit for using as teaching experiment samples.

After experiment, two group learners' task orientation levels have significant differences, and experimental group learners are significant superior to control group learners that goal orientation teaching method is superior to traditional normal teaching method.

Experimental class has significant differences in before and after experiment task orientation levels, while control class has no significant difference; it shows goal orientation teaching method is helpful for greatly promoting students' task orientation level.

After experiment, two classes have no significant differences in physical quality aspect, they have significant differences in badminton technical level, and in technical test two test goals, experimental class is superior to control class; it indicates goal orientation teaching method is very suitable to badminton teaching, is helpful for significant promoting badminton technical and tactics level.

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