

Implementing Ecological Paradigm Teaching Strategy on Sports Class Quality of China: An Action Research Study of a College Sports Class

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Abstract

Purpose- As the health of Chinese college students continues to decline, people realize that the quality of college sport class quality is one of the main factors affecting student health. This research is through ODI to change the teaching strategy, and improve the sports motivation, sports ability and Satisfaction with teachers. It will verify the effectiveness and feasibility of ODI methods in China's sport class.

Design/Methodology/Approach- Use a dual experimental group design, combination of qualitative and quantitative action research. Collect qualitative and quantitative data before and after ODI, Paired-sample t-test, Pearson correlation, and regression analysis were used to determine. This organization is a public university in the south of China. sports teachers (n=3), college students (n=127).

Findings- The implementation of ODI can significantly improve sports class quality; There is a significant causal relationship between the independent variables of ecological paradigm teaching strategy (Leadership, Managerial, Social, Vector, Instructional) and the dependent variables of Sports class quality; the dependent variables (Sports motivation, Sports ability, Satisfaction with teachers) are highly correlated, Intervention of one factor can predict another factor.

Practical Implications- The research will have a positive impact on the health of Shaoguan University students; The results will be used as reference for the improvement of physical education teaching in Chinese universities.

Originality/Value- The study verifies the feasibility of organizational development intervention

methods in Chinese sport classes; Put forward the "Ecological Paradigm Teaching Strategy Model"; Summarizes the theoretical framework, conceptual framework and action basis; it is an innovative research based on the combination of organizational development and sports class.

Keywords: organization development, ecological paradigm, teaching strategy, sports quality, sports class.

1. Introduction

2020 WHO guidelines on physical activity and sedentary behaviour report that exercise can maintain good health (Chaput et al., 2020). However, more than 80% of young students do not meet the sport's standards (WHO, 2019). In China, the lack of sports among college students is severe. The existing data found that the health of Chinese college students is getting worse and worse, in speed, endurance, and other important indicators have been lower than the average level of high school students (MEC, 2019).

The teaching quality of the sports class curriculum is the core factor that affects students' sports motivation (Scheuer et al., 2014). The academic circles have not precisely defined what "Sports Class Quality" is. Sallis & McKenzie (1991) found that people all agreed that high-sports class quality has an important relationship with students' activity, and high-activity classrooms are closely related to students' exercise motivation, athletic ability, and satisfaction. The three core factors in the physical education classroom include sports motivation (Cuevas et al., 2018), sports ability (Green Demers et al., 2008), and student satisfaction with teachers (Kayisoglu & Yuksel, 2016).

2. Literature Review and Hypotheses

For most students, physical education in the school is the only way to learn sports knowledge and participate in physical exercise (Corbin, 2002). Therefore, exploring the comprehensive factors in sports class is very important to improve the quality.

2.1. The Task Model of Sports Class

Hastie and Siedentop (1999) pointed out that the sports class includes three different task systems: Instructional task systems, Managerial task systems, and sSocial task systems. These task systems represent the classroom and the combination of related things, and one system change will impact other systems, this impact can be positive or negative.

Instructional task systems. Including teachers' teaching guidance and student learning behaviour (Hastie & Siedentop, 2006). The six key concepts of the teaching task system are developmental sequencing, risk, ambiguity, novelty, instruction pace, and challenge (McCaughtry et al., 2008). Teachers must match the level of the teaching task with the skill level of the students to improve the teaching effect (McCaughtry & Rovegno, 2003). Risks in the teaching task can be avoided, which depends on the teacher's behavior. When students feel that the teaching task will adversely affect

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themselves, they will act cautiously (Panicucci et al., 2002). Tasks with task clarity can increase the student's execution rate (Siedentop et al., 1994). Innovative teaching methods, teaching tasks and achieving goals can enhance students' learning motivation (McCaughtry et al., 2006).

Managerial task systems. Including a variety of classroom systems, evaluation methods, etc., related to attendance, classroom behavior and learning performance. Managerial tasks are highly related to classroom behavior. Applying some management techniques to physical education classes can improve teaching quality and efficiency and have a positive impact on student performance (Hastie & Siedentop, 2006).

Social task system. McCaughtry (2008) believes that a more complex social system should be full of triple relationships: 1) the social relationship between teachers and students; 2) the social relationship between students; 3) the relationship between students and the school social relationship. The better the teacher-student relationship, the higher the students' enthusiasm for participating in sports activities (Curran & Standage, 2017). When students feel the love and care of the teacher, they will behave harder and more positively (Pozo, 2018). If the social relationship between students is harmonious, it will promote learning (McCaughtry, 2006). The school's construction ideas will inform teachers and students at school values and pursuits (Skaalvik & Skaalvik, 2017).

2.2. Leadership Action Model of Sports class

Doyle, (1986) promoted the concept of action model, which is used to determine the direction, content, and management integrity and consistency of the subject. In other words, the action plan is the course of action to complete the goals, contents and results involved in the teaching theme. Many researchers believe that actions in sports class include vector (McCaughtry, 2008), teacher leadership (Castillo et al., 2017) and teaching style (Zeng, 2016).

Vectors. Vectors is a general term based on the internal goals of teachers and students. The vector in the sports class includes two aspects: teacher vector and student vector, which are the motivation and passion to achieve goals in classroom actions (McCaughtry et al., 2008). Vectors are the basis of action for teachers and students' expectations, values, and motivations in the classroom.

Sports teaching leadership. Teachers' class action is defined as the only concept that directly affects students' learning (Palardy & Rumberger, 2008). The interactive relationship between teachers and students determines the quality of teaching (Hastie & Siedentop, 2006). The study found that teachers' leadership behavior does affect students' attitudes (Castillo et al., 2017). There is an important internal relationship between teachers' professional skills and teaching quality (Gore, 2017). Teachers' knowledge level is related to students' academic performance, teachers' diagnostic ability is related to effective feedback, and teachers' management ability is related to students' positive performance (Brunner et al., 2006). Teachers with transformational leadership can improve teacher-student interaction and create a good classroom atmosphere, to further improve the learning effect (Sirin, 2018).

2.3. Literature Review Summary

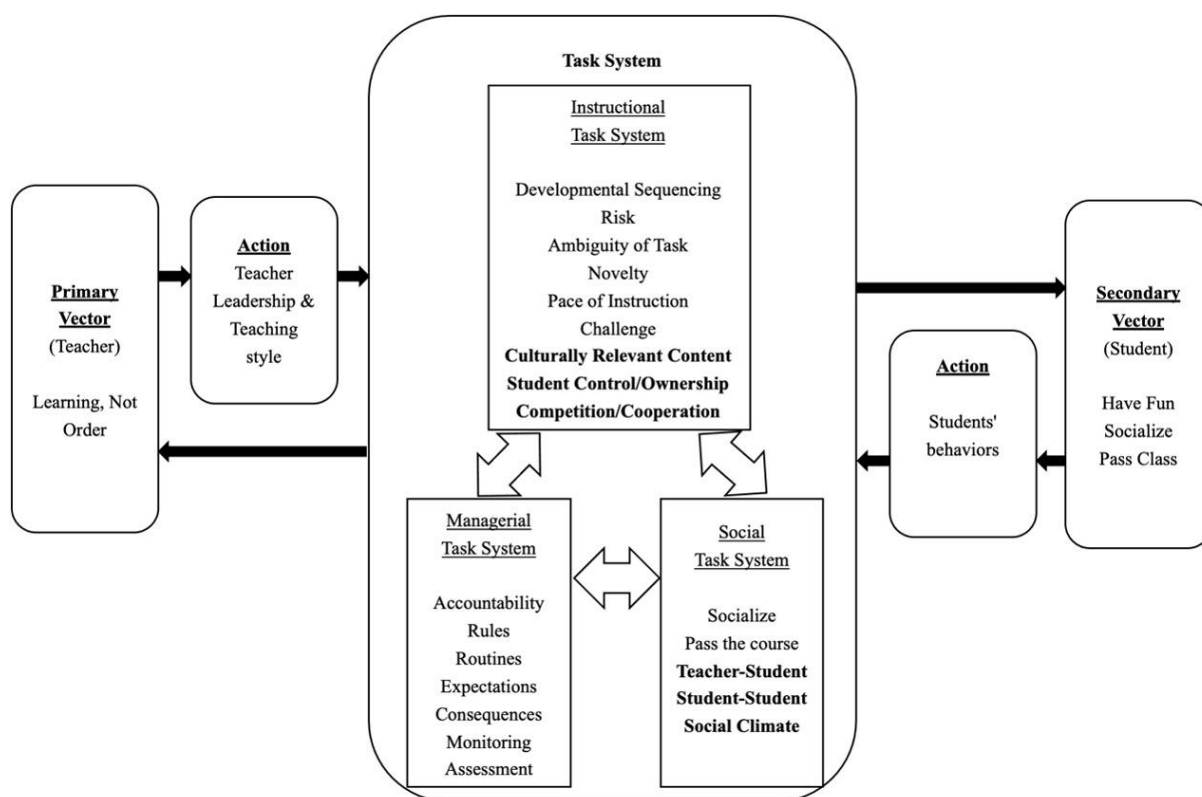
There should be two kinds of factors, task factor and action factor. Task factors include instructive task systems, managerial task systems and social task systems. The three factors affect each other. They constitute the core factor of sports class.

In addition, it is the action factor. In other words, only the existence of action factors can make the task factor communicate circularly between teachers and students. Therefore, task factors and action factors can be combined to explain sports class teaching.

2.4. Theoretical Framework

Previous studies have explained the influencing factors in the sports class. Including the task model and the action model, the combination of these factors can fully explain the content of the sports class. It's straightforward to note that this sports class is a cyclical process. Teachers and students are constantly negotiating in their actions to achieve the quality of sports class. Therefore, the theoretical framework is designed in the research (see Figure 1). This model is an adaptation of the predecessor "ecological paradigm model". It explains the vector, action and three task systems in the physical education classroom and expresses the mutual movement relationship between the classroom elements.

Figure.1 Ecological System Model of Sports Class



Source: Theoretical framework creates based on Ecological Paradigm (McCaughtry et al., 2008)

2.5. Conceptual Framework

Research has pointed out that the primary vector of teachers can affect students' feelings, motor skills and external performance (McEntyre et al., 2020). When the teacher's goal is consistent with the student's, it can be enjoyed by the student and improve learning motivation (Jetzke & Mutz, 2020).

*The clarity of vector is related to the student's execution rate. Clear instructional tasks can increase students' participation and enthusiasm (Hastie & Siedentop, 2006).

*When the instructive task matches the student's level and desire, it can improve the student's learning motivation and skills (Morgan & Carpenter, 2002)

*Efficient Managerial Task will improve students' initiative and learning performance (Pop, 2012).

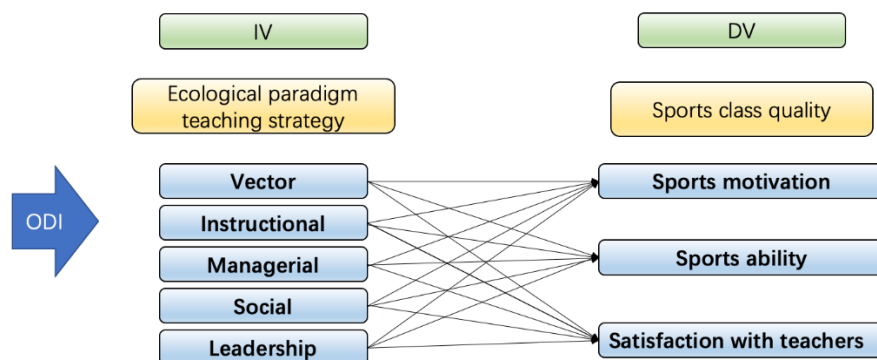
*The social task research shows that the better the teacher-student relationship, the higher the student's participation (Curran & Standage, 2017).

*There is an important link between the teaching leadership of physical education teachers and the quality of teaching (Gore, 2017),

*The leadership behavior of teachers affects the behavior and attitudes of students (Castillo et al., 2017). There is a close relationship between teacher professional ability and student performance (Yoon et al., 2007), successful teachers will use different leadership styles in their teaching (Curran & Standage, 2017).

Therefore, the design of the conceptual framework fully shows the relationship between the relevant dimensions of the sports class and the sports class quality (see Figure 2). The five sub-dimensions (Vector, Instructional, Managerial, social, and leadership) in sports class are all related to the teaching quality. The specific manifestation is that each dimension of the sports class has an impact on students' sports motivation, sports ability, and satisfaction with teachers. Therefore, the five sub-dimensions of action intervention may improve the sports class quality. Specifically, after ODI, it can improve students' sports motivation, sports ability, and satisfaction with their teachers.

Figure. 2 Ecological Paradigm Teaching Strategy on Sports Class Quality



2.6. Research Hypothesis

This research attempts to determine a method of active intervention from previous theories, which can change the ecological paradigm teaching strategy and improve the quality of physical education. In order to achieve the desired goal, it is necessary to determine whether the ecological paradigm teacher strategy has changed and then determine whether ODI has improved the teaching quality by changing the ecological paradigm teaching strategy. Therefore, the research hypothesis is:

Ho1: There is no significant difference in the Ecological Paradigm Teaching Strategy before and after ODI.

Ha1: There is a significant difference in the Ecological Paradigm Teaching Strategy before and after ODI.

Ho2: After ODI, the Ecological Paradigm Teaching Strategy has no significant impact on sports motivation of college students.

Ha2: After ODI, the Ecological Paradigm Teaching Strategy has a significant impact on sports motivation of college students.

Ho3: After ODI, the Ecological Paradigm Teaching Strategy has no significant impact on sports ability of college students.

Ha3: After ODI, the Ecological Paradigm Teaching Strategy has a significant impact on sports ability of college students.

Ho4: After ODI, the Ecological Paradigm Teaching Strategy has no significant impact on college students' satisfaction with teachers.

Ha4: After ODI, the Ecological Paradigm Teaching Strategy significantly impacts college students' satisfaction with teachers.

3. Methodology

3.1. Sample Selection

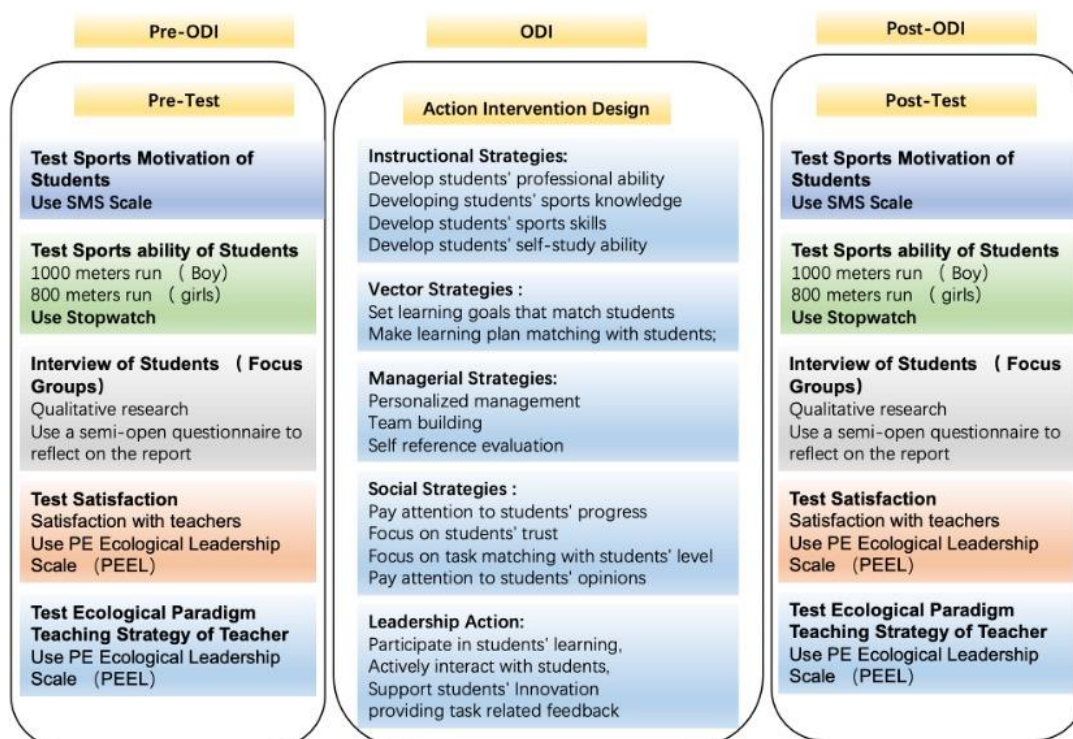
Sixteen weeks of experiment (March-June 2021). The participant was a university in southern China. $n=3$ for sports teachers. Three sports classes were randomly selected, and the method of fling coin was used to determine the experimental group 1($n=42$), the experimental group 2($n=42$), and the control group ($n=43$). Each group has a focus group (low-motivated students, $n=2$, boy 1, girl 1). To verify the effectiveness of the ODI method, the teachers of experimental group 1 are members of the research group, and the teacher of experimental group 2 are ordinary teacher who have passed the “Ecological Paradigm Teaching Strategy” training, control group’s teacher is ordinary teacher.

3.2. Research Method

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The qualitative analysis comes from the focus group's reflection report. The focus group is required to answer questions according to the report's content, using a semi-open questionnaire. Using a stopwatch to measure the students' running performance (Boys' 1000-Meter, Girls' 800-Meter) to determine the sport's ability of college students; Using the Sport Motivation Scale (SMS) to analyze college students' sport motivation; Using the Physical Education Ecological Leadership Scale (PEEL) to measure teachers' teaching strategies and students' satisfaction with teachers (Figure 3). The quantitative analysis mainly includes paired sample t-test and regression analysis.

Figure. 3 Research Method Procedural Diagram



3.3. Instrument

Sports Motivation Scale (SMS). (Pelletier et al. 2013) use the framework of self-determination theory to assess personal motivation for exercise. The scale was compiled in 1995 and had high reliability. The reliability of the SMS scale is 0.75, the validity of the KMO is 0.828, and the Bartlett sphericity test is $p < 0.001$. A 7-point Likert scale from 1 (no correspondence) to 7 (complete correspondence) was used to assess participants' motivation.

Physical Education Ecological Leadership Scale (PEEL). This tool has been proven to measure student satisfaction with teachers and sports ecological paradigm teaching strategies. The reliability of the table is 0.962, and the validity of KMO is 0.995. When answering questions, you need to use a 5-level standard assessment (1 never, 2 rarely, 3 occasionally, 4 often, 5 always) plus an opening sentence "My teacher...".

4. Data Analysis

4.1. Paired Sample Test of Teaching Strategy

Through ODI, the ecological paradigm teaching strategy has changed (Table 1).

Table 1. Ecological Paradigm Teaching Strategy Changed

Paired Samples Test											
Group	Motivation	N	Stage	Paired Differences					t	df	Sig. (2-tailed)
				Mean	Std. Deviation	Std. Error	95% Confidence				
							Lower	Upper			
Experimental group1	Instructional	42	Pre-Post ODI	-0.71032	0.94069	0.14515	-1.00346	-0.41718	-4.894	41	0.000
	Managerial			-0.14603	0.37611	0.05804	-0.26324	-0.02883	-2.516	41	0.016
	Social			-0.36508	0.78281	0.12079	-0.60902	-0.12114	-3.022	41	0.004
	Leadership			-0.89762	1.20537	0.18599	-1.27324	-0.522	-4.826	41	0.000
	Vector			-0.73016	1.09875	0.16954	-1.07255	-0.38776	-4.307	41	0.000
Experimental group2	Instructional	42		-0.61111	0.77097	0.11896	-0.85136	-0.37086	-5.137	41	0.000
	Managerial			-0.38095	0.70095	0.10816	-0.59938	-0.16252	-3.522	41	0.001
	Social			-0.36905	0.74311	0.11466	-0.60062	-0.13748	-3.218	41	0.003
	Leadership			-0.36905	0.7422	0.11452	-0.60033	-0.13776	-3.222	41	0.002
	Vector			-0.5	1.41852	0.21888	-0.94204	-0.05796	-2.284	41	0.028
Control group	Instructional	43	0.03876	0.17757	0.02708	-0.01589	0.09341	1.431	42	0.160	
	Managerial		0.02791	0.1548	0.02361	-0.01973	0.07555	1.182	42	0.244	
	Social		0.03101	0.20333	0.03101	-0.03157	0.09358	1	42	0.323	
	Leadership		0.03488	0.16887	0.02575	-0.01709	0.08685	1.355	42	0.183	
	Vector		0.04651	0.28481	0.04343	-0.04114	0.13416	1.071	42	0.290	

The ecological paradigm teaching strategies in the experimental group have undergone significant changes. The five sub-dimensions (Instructional, Managerial, Social, Leadership and Vector) are all improved. There is no significant difference in the control group, which shows that ODI can effectively improve the ecological paradigm teaching strategy.

4.2. Paired Sample Test of Sports Motivation

Through ODI, students' motivation for sports has changed (see Table 2).

Table 2. Sports Motivation Changed

Paired Samples Test											
Group	Motivation	N	Stage	Paired Differences					t	df	Sig. (2-tailed)
				Mean	Std. Deviation	Std. Error	95% Confidence				
							Lower	Upper			
Experimental group1	Intrinsic motivation	42	Pre-Post ODI	-1.38492	1.81804	0.28053	-1.95146	-0.81838	-4.937	41	0.000
	Extrinsic motivation			-1.24603	1.72106	0.26557	-1.78235	-0.70971	-4.692	41	0.000
	Amotivation			0.98214	1.56017	0.24074	0.49596	1.46833	4.08	41	0.000
Experimental group2	Intrinsic motivation	42		-1.03175	1.77283	0.27355	-1.5842	-0.47929	-3.772	41	0.001
	Extrinsic motivation			-1.20437	1.74687	0.26955	-1.74873	-0.66	-4.468	41	0.000
	Amotivation			0.97024	1.19603	0.18455	0.59753	1.34295	5.257	41	0.000
Control group	Intrinsic motivation	43		0.00969	1.64673	0.25112	-0.4971	0.51648	0.039	42	0.969
	Extrinsic motivation			-0.02326	1.43387	0.21866	-0.46454	0.41803	-0.106	42	0.916
	Amotivation			-0.09302	1.74235	0.26571	-0.62924	0.44319	-0.35	42	0.728

There were significant differences in exercise motivation in the experimental group. The data results can prove that ODI can improve students' internal motivation and external motivation and reduce Amotivation.

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4.3. Paired Sample Test of Sports Ability

Through ODI, students' sports ability has changed (see Table 3).

Table. 3. Sports Ability Changed

Paired Samples Test											
Group	Gender/ Sports ability	N	Stage	Paired Differences					t	df	Sig. (2-tailed)
				Mean	Std. Deviation	Std. Error	95% Confidence				
							Lower	Upper			
Experimental group1	Male(1000m)	6	Pre-Post ODI	42.667	28.794	11.755	12.45	72.884	3.63	5	0.015
	Female(800m)	36		28.917	22.224	3.704	21.397	36.436	7.807	35	0.000
Experimental group2	Male(1000m)	22		27.909	18.353	3.913	19.772	36.047	7.132	21	0.000
	Female(800m)	20		11.3	11.716	2.62	5.817	16.783	4.313	19	0.000
Control group	Male(1000m)	31		-6.387	17.946	3.223	-12.97	0.195	-1.982	30	0.057
	Female(800m)	12		-1.25	19.231	5.552	-13.469	10.969	-0.225	11	0.826

The performance of the two experimental groups improved significantly, while the control group had no significant difference, confirming that ODI can significantly improve students' sports ability.

4.4. Paired Sample Test of Satisfaction with Teachers

Through ODI, students' Satisfaction with teachers changes (see Table 4).

Table. 4. Students' Satisfaction with Teachers Changes

Paired Samples Test											
Group	Satisfaction with Teachers	N	Stage	Paired Differences					t	df	Sig. (2-tailed)
				Mean	Std. Deviation	Std. Error	95% Confidence				
							Lower	Upper			
Experimental group1	Total score	42	Pre-Post ODI	-11.881	19.28376	2.97555	-17.8902	-5.87171	-3.993	41	0.000
Experimental group2	Total score	42		-9.97619	15.60564	2.408	-14.8393	-5.11313	-4.143	41	0.000
Control group	Total score	43		0.76744	3.65042	0.55668	-0.35599	1.89088	1.379	42	0.175

The experimental group students' Satisfaction with the teacher increased significantly, while the control groups did not change significantly. It is proved that ODI can significantly improve students' Satisfaction with teachers.

4.5. Regression Analysis of Results

Regression Analysis of Strategy and Sports Motivation. The causal relationship between ecological paradigm teaching strategy and Internal Motivation (see Table 5).

Table 5. Regression analysis of Strategy and Motivation

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	261.873	5	52.375	587.461	.000 ^b
	Residual	10.788	121	0.089		
	Total	272.66	126			
a Dependent Variable: Intrinsic motivation						
b Predictors: (Constant), Instructional, Managerial, Social, Leadership ,Vector						
Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	Instructional	0.423	0.061	0.215	6.976	0.000
	Managerial	0.542	0.065	0.275	8.316	0.000
	Social	0.47	0.085	0.215	5.524	0.000
	Leadership	0.441	0.096	0.207	4.585	0.000
	Vector	0.279	0.035	0.198	7.959	0.000
a Dependent Variable: Intrinsic motivation						
ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	211.023	5	42.205	331.638	.000 ^b
	Residual	15.399	121	0.127		
	Total	226.422	126			
a Dependent Variable: Extrinsic motivation						
b Predictors: (Constant), Instructional, Managerial, Social, Leadership ,Vector						
Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	Instructional	0.456	0.072	0.254	6.298	0.000
	Managerial	0.546	0.078	0.304	7.006	0.000
	Social	0.328	0.102	0.165	3.230	0.002
	Leadership	0.252	0.115	0.13	2.191	0.030
	Vector	0.324	0.042	0.252	7.737	0.000
a Dependent Variable: Extrinsic motivation						
ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	179.868	5	35.974	658.041	.000 ^b
	Residual	6.615	121	0.055		
	Total	186.482	126			
a Dependent Variable: Amotivation						
b Predictors: (Constant), Instructional, Managerial, Social, Leadership ,Vector						
Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	Instructional	-0.352	0.047	-0.216	-7.417	0.000
	Managerial	-0.395	0.051	-0.242	-7.732	0.000
	Social	-0.504	0.067	-0.278	-7.561	0.000
	Leadership	-0.311	0.075	-0.177	-4.128	0.000
	Vector	-0.231	0.027	-0.198	-8.436	0.000
a Dependent Variable: Amotivation						

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There is a significant causal relationship between ecological paradigm teaching strategies and Intrinsic motivation, Extrinsic motivation, and Amotivation. All sub-dimensions have a significant causal relationship with the Intrinsic motivation, Extrinsic Motivation, and Amotivation of students.

Regression Analysis of Strategy and Sports Ability. The causal relationship between strategies and sports ability (see Table 6).

Table 6. Regression Analysis of Strategy and Sports Ability

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	128349.446	5	25669.889	167.125	.000 ^b
	Residual	18585.278	121	153.597		
	Total	146934.724	126			
a Dependent Variable: Sports ability						
b Predictors: (Constant), Instructional, Managerial, Social, Leadership ,Vector						
Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	Instructional	-8.888	2.517	-0.194	-3.531	0.001
	Managerial	-8.836	2.707	-0.193	-3.263	0.001
	Social	-15.6	3.53	-0.307	-4.419	0.000
	Leadership	-9.067	3.992	-0.183	-2.271	0.025
	Vector	-5.732	1.455	-0.175	-3.941	0.000
a Dependent Variable: Sports ability						

There is a significant causal relationship between ecological paradigm teaching strategies and Intrinsic motivation. All sub-dimensions have a significant causal relationship with the sports ability of students.

Regression Analysis of Strategy and Satisfaction with Teachers. The relationship between strategies and students' Satisfaction with teachers (see Table 7).

Table 7. Regression Analysis of Strategy and Satisfaction with Teachers

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32495.156	5	6499.031	860.025	.000 ^b
	Residual	914.372	121	7.557		
	Total	33409.528	126			
a Dependent Variable: Satisfaction with Teachers						
b Predictors: (Constant), Instructional, Managerial, Social, Leadership ,Vector						
Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	Instructional	4.08	0.558	0.187	7.308	0.000
	Managerial	5.531	0.601	0.253	9.21	0.000
	Social	7.916	0.783	0.327	10.109	0.000
	Leadership	5.932	0.886	0.252	6.698	0.000
	Vector	1.071	0.323	0.069	3.32	0.001
a Dependent Variable: Satisfaction with Teachers						

There is a significant causal relationship between ecological paradigm teaching strategies and student satisfaction with teachers. All sub-dimensions have a significant causal relationship with the satisfaction with teacher.

4.6. Data Analysis Result

The research results show that the null hypothesis was rejected. The results show that ODI has practical effects and significantly improves the sports class quality.

Ha1: There is a significant difference in the Ecological Paradigm Teaching Strategy before and after ODI.

Ha2: After ODI, the Ecological Paradigm Teaching Strategy has a significant impact on sports motivation of college students.

Ha3: After ODI, the Ecological Paradigm Teaching Strategy has a significant impact on sports ability of college students.

Ha4: After ODI, the Ecological Paradigm Teaching Strategy significantly impacts college students' satisfaction with teachers.

5. Conclusion and Discussion

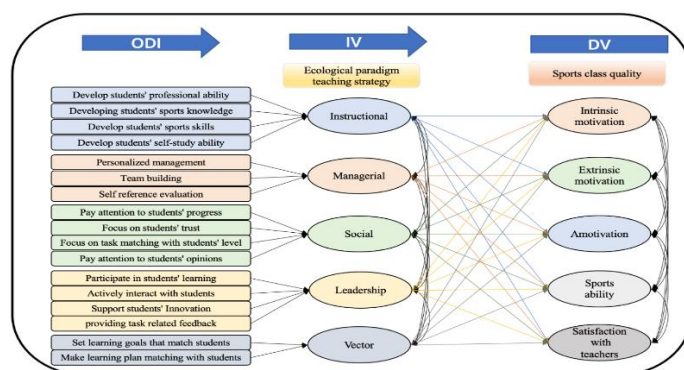
5.1. Research Findings

Through quantitative research, found an effective model of organizational development intervention in sports class quality "Ecological Paradigm Teaching Strategy Model". Through qualitative research, we discovered the influence of the important content of ODI design on sports class quality.

5.1.1. Ecological Paradigm Teaching Strategy Model

Through research and analysis, it can be proved that ODI and ecological paradigm teaching strategies can improve the quality of sports classrooms (i.e., sports motivation, sports ability, satisfaction with teachers). Further specific research results can be described in the figure (see Figure 4).

Figure. 4 Ecological Paradigm Teaching Strategy Mode



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The figures 4 describes the impact of organizational development-based action design on the ecological paradigm teaching strategy, Firstly, the figure depicts the high dependence of the sub-dimensions of the ecological paradigm teaching strategy, but they cannot be replaced.

Secondly, it: 1) Develop students' professional ability, Develop students' sports knowledge, Develop students' sports skills, and Develop students' self-study ability can interfere with Instructional; 2) Personalized management, Team building, Self-reference evaluation can interfere with the managerial; 3) Pay attention to students' progress, Focus on students' trust, Focus on task matching with students' level, Pay Attention to students' opinions can interfere with classroom social; 4) Participate in students' learning, Actively interact with students, Support students' Innovation, and providing task related feedback can interfere with teacher leadership; 5) Set learning goals that Match students, Make learning plan matching with students can interfere with the vector.

Third, the figure describes the linear relationship between the ecological paradigm teaching strategy and the overall sports class quality: 1) the ecological paradigm teaching strategy has a significant causal relationship with the sports class quality; 2) There is a significant causal relationship between the sub-dimensions of ecological paradigm teaching strategy and all sub-dimensions of physical education classroom quality; 3) The sub-dimensions of physical education quality are highly correlated, and changes in one sub-dimension can predict changes in other sub-dimensions.

5.1.2. Research Findings about Instructional

It is important to explain exercise principles and exercise skills. Compared with traditional teaching, ODI design requires more teachers to introduce sports principles and application techniques, especially to integrate sports with students' lives. Students seem to prefer this way of learning.

The focus group (experimental group) said, "We can feel sufficient sports knowledge, rich knowledge of expansion and sports knowledge in the classroom, so that we know how to exercise. For example, I used to measure the amount of exercise based on my own feeling (tired or not), but the teacher made me understand that measuring heart rate is the most accurate, I also understand that everyone's maximum heart rate is different, and I know how to measure my maximum heart rate."

The students in the focus group (control group) felt "the class is boring, the curriculum is not sufficient, and the lack of sports knowledge is awarded." When asked about "teaching guidance" the student's answer, the teacher just directs us to exercise without explaining, I don't know how to do it, and I don't want to move.

5.1.3. Research about Managerial

Team building is very important. Dividing students into different groups can enhance students' sense of responsibility and enthusiasm. Designing member roles in team members can better play the role of

each student. ODI design each small team has a leader, a supervisor, and other members take turns to be on duty (task performer). Students like this design very much. The focus students (experimental group) felt that "task division is in place, teamwork, learning and communication, and teamwork awareness has been improved." The student said, "A lot of times I don't want to participate, but my partners encourage me. I feel very happy to be with them, and they are willing to participate. Especially on the day I was a day student, I am very concerned about my performance. After all, I On behalf of our team"

The Self-transcendence evaluation method is very effective. Self-transcendence score sheet designed by ODI (see appendix E, F). Every student regards himself as the object of transcendence, which is more effective than traditional evaluation methods. More than 85% of the students in the experimental group successfully achieved self-transcendence. But more than 70% of the students in the control group dropped in performance

5.1.4. Research about Social

It is important to listen to the opinions of students. ODI design requires teachers to listen carefully to students' learning opinions and provide effective feedback. The focus students (experimental group) felt that "focus on student breakthroughs, focus on student growth, focus on team growth, and be friends with students". The student said, "My teacher treats me like a friend. I have started to ask him more and more questions and ideas for improvement. I am very serious and responsible and can attract everyone's interest." The student said, "My teacher treats me like a friend. I have started to ask him more and more questions and ideas for improvement. I am very serious and responsible and can attract everyone's interest." The focus student (control group) said, "My teaching management is single, the discipline is loose, the teaching method is old-fashioned, and I only pursue tasks, which I don't like."

5.1.5. Research about Leadership

It is very important to cultivate students' self-learning ability. ODI design requires a small team to complete knowledge learning and sharing together, and the students on duty will speak in the next class. The focus students (experimental group) felt that "learning to learn from the experience of others, expanding their awareness of actual combat, thinking about problems together, solving problems, and experiencing with classmates." The students said that they have never tried to learn sports theory and methods outside of class. This is more than listening to the teacher.

5.1.6. Research about Vector

Clear teaching tasks and teaching plans are very important. The ODI design requires teachers to clarify teaching objectives, evaluation methods, and management systems at the beginning of the semester, and introduce classroom content and implementation plans at the beginning of each course. The focus students (experimental group) felt that "there are clear tasks, reasonable time allocation, orderly classroom organization, effective mobilization of enthusiasm, clear evaluation methods, and

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clear student goals". The student said, "I know exactly what I want to do, and I know how to do it. I have planned from the beginning how I should pass the physical education class this semester." The focus students (control group) felt "unclear tasks, few tasks, simple tasks, unclear evaluation methods, and insufficient curriculum arrangements". The student said, "I don't know what I am going to do, I feel so tired."

5.2. Conclusion

This article is mainly based on the field of organizational development, studying the intervention and influence of ecological paradigm teaching strategy on sports class quality of China.

The results show that: 1) ODI can improve the ecological paradigm teaching strategy; 2) ODI can improve the ecological paradigm teaching strategy, which can significantly improve the sports class quality in Chinese universities.

5.3. Discussion

Modern life causes people's exercise levels to continue to decline (Chaput et al., 2020). The athletic ability of Chinese college students continues to decline (Dong et al., 2019).

The sports class quality is the main factor affecting students' attitudes (Scheuer et al., 2014). The study found that the intervention method based on the theory of organizational development can effectively achieve the intervention of classroom strategy. Through ODI, the teaching strategy of experimental subjects has undergone significant changes, and this change has improved the sports class quality. This research has similarities with previous studies and has discoveries.

There is a significant difference in the Ecological Paradigm Teaching Strategy before and after ODI.

The diversity, novelty, and difference of the curriculum goals will attract students' Attention, thereby promoting learning (Ames, 1992). The ecological paradigm is an effective system in the physical education classroom. It represents the comprehensive factors in the classroom environment and plays an essential role in explaining physical education teaching (Hastie & Siedentop, 2006).

Through ODI, the experimental group can feel the significant changes in classroom teaching strategies. Focus students said: "My teacher can pay attention to all aspects of the classroom, can attract everyone's interest, control the class order properly, and promote the improvement of students."

After ODI, the Ecological Paradigm Teaching Strategy has a significant impact on the sports motivation of college students.

Effective teaching behaviour is positively correlated with students' motivation to exercise (Shephard et al., 2000). Through ODI, the experimental group Both extrinsic motivation and intrinsic motivation increased significantly, but Amotivation decreased.

The Focus group means “sufficient sports knowledge, effective mobilization of enthusiasm, teamwork, friend-like management, evaluation methods that encourage transcendence, suitable exercise volume, individual design, diversified exercise volume options, The difficulty of the task matches the students.”

After ODI, the Ecological Paradigm Teaching Strategy has a significant impact on the sport's ability of college students.

Practical sports classes can improve students' sports skills and abilities (Sallis et al., 2012). Through ODI, the sport's ability of the experimental group was significantly improved.

Focus students felt the changes in teaching guidance, teaching management, teacher leadership and Vector (Instructional, Managerial, Leadership and Vector), which proved that through ODI, teaching strategies have changed, and this change has improved students' sports ability.

After ODI, the Ecological Paradigm Teaching Strategy significantly impacts college students' Satisfaction with teachers.

Straightforward teaching tasks, efficient classroom management, supportive leadership, harmonious teacher-student relationships, active and effective feedback, and self-referencing evaluation methods can improve student satisfaction (Mahoney et al., 2005). The study results show that through ODI, the Satisfaction of the experimental group of students with teachers has increased significantly.

The Focus group reported "clear task arrangement, interesting and novel task design, diversified tasks, active classroom atmosphere, reasonable evaluation methods, focusing on student breakthroughs, and a friend-like management method". This shows that the teaching strategy has been changed through ODI, and this change can improve students' Satisfaction with teachers.

5.4. Recommendations

How to improve the athletic ability of college students is a big challenge. An important factor affecting students' participation in physical exercise is sports class (Kokoulina et al., 2019). The intervention of ecological paradigm teaching strategies on the sports class quality in universities can be used as an intervention framework to improve the sports class quality universities. This framework has been applied to the teachers in the experimental group and the experimental group. Both groups of teachers have proved the reliability and applicability of the ecological paradigm teaching strategy. Shaoguan College will significantly improve college physical education and students' motivation and ability to adapt to this teaching strategy. Improving the physical fitness of college students and improving the quality of college physical education are important methods. The researchers' recommendations are as follows:

Improving the sports class quality should be based on the core factors of the classroom.

According to the research results, implementing an ecological paradigm teaching strategy is very effective to improve the quality of physical education classroom teaching. First, the teaching strategy

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based on the ecological paradigm includes the core dimensions of the physical education classroom and has a comprehensive impact on the quality of teaching. Secondly, the teaching strategy of the ecological paradigm can effectively improve the overall quality of teaching.

Improving the sports class quality should be based on scientific intervention methods. It is an effective method to use the theory of organizational development to intervene in the quality of physical education in colleges and universities. First, organizational development interventions are action-oriented comprehensive interventions. ODI design includes all dimensions of classroom ecology (i.e., Instructional, Managerial, Social, Leadership and Vector). This kind of design has the characteristics of integrity; secondly, designing teaching strategies from organizational development is a developmental intervention in teaching quality. Team building, self-transcendence, learning sharing, self-reflection, straightforward tasks, challenging tasks, and teacher leadership in ODI design all directly improve the quality of teaching.

5.5. Limitation and Future Research Directions

Based on the limitation of research time and restriction of other factors, the implementation of ODI in this research has been carefully designed. However, it is still not at the ideal level of implementation. Therefore, recommendations for future research are as follows:

The current research is limited to the sample size, and the total sample size is only 127. Although the effectiveness of ODI is verified, yet the sample size is more significant at 5% sample error. Therefore, in the future, large sample size can be used simple random sampling method.

The research time frame, the current research used one semester, four months of research time. However, the results confirmed its effectiveness; the intervening exercise motivation was insufficient; in the future, a longer-term intervention plan should be considered.

The research content, at present, the impact of ecological paradigm teaching strategy on the quality of three sub-dimensions of physical education have been improved. However, there is no in-depth analysis of the importance of sub-dimensions of ecological paradigm teaching strategy. Future research can analyze the size and order of individual influence of sub-dimensions.

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