

# Optimizing BOPPPS Teaching Strategy in Influencing College Students after Class Sports Activities

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## ABSTRACT

Lifelong sports aim to deeply embed the concept into people's daily lives. This study extends physical education beyond the classroom with innovative teaching models to boost students' extracurricular sports participation and develop lifelong physical education skills. It aimed to optimize college students' sports participation and explore effective teaching models and strategies. The study involved 364 students from basketball, volleyball, and aerobics majors at Xinyang Normal University, using a descriptive-comparative-correlational research design and a self-constructed questionnaire. The study employed statistical tools such as ranking, standard deviation, weighted mean computation, frequency count and percentage, T-test, and Spearman's rho Correlation Coefficient for a methodical presentation, analysis, and interpretation of data. It concluded that all components of the BOPPPS model-Bridge in, Objective, Preassessment, Cognitive Participation, Participant Learning and Behavioral Participation, Post-assessment and learning outcomes, and Emotional Participation-are effective in engaging students in PE classes. The analysis showed insignificant differences based on respondents' sex, age, and elective choices, thus accepting the null hypothesis. However, the study found a significant relationship between the four elements of BOPPPS (Bridge in, Objectives, Pre-assessment and cognitive engagement, Participation Learning and Behavioral Participation, Post-assessment and effect Participation, and Emotional Participation) and respondents' participation in after class sports activities, including interests and motivation, habits and plans, and attitude and behavior, necessitating the rejection of the null hypothesis. It is recommended to continue promoting inclusivity and diversity in sports participation to ensure equitable access and opportunities for all individuals, regardless of demographic characteristics. Emphasizing and integrating the BOPPPS framework into sports education programs can enhance participants' interest, motivation, habits, plans, attitudes, behaviors, and overall engagement in after class sports activities, leading to more effective outcomes.

## KEYWORDS

BOPPPS; Teaching Strategy; College Students' Participation; After Class; Sports Activities.

## 1. INTRODUCTION

As technology rapidly advances and the information age unfolds, there is a corresponding increase in the nation's demand for nurturing talent. This necessitates not only the enhancement of students' cultural literacy but also a focus on improving their physical fitness. Consequently, physical education instruction in China for college students has emerged as a crucial element of the curriculum. As China undergoes continuous and profound reforms in national education and teaching, the new curriculum changes set forth even higher demands for the reform of physical education teaching in universities. In order to align with the progress in higher education in this new era, educators and scholars engage in constant reflection, exploration, discussion, and the assimilation of cutting-edge international

educational and teaching concepts. This effort provides a theoretical foundation for diverse learning assessments in the realm of physical education; Zhang (2021).

Physical education teachers exhibit diversity in their approaches, employing a variety of teaching methods and strategies to enhance the educational process (Smith, 2019). However, when delving into the specifics, a common driving force unites all educators: a profound eagerness to share knowledge (Jones & Brown, 2020). This underscores the significance of teachers fine-tuning their teaching techniques. In the words of Einstein, "It is the supreme art of the teacher to awaken joy in creative expression and knowledge" (Einstein, 1936, p. 45). Contemporary educators can achieve this by enhancing their delivery methods, recognizing their distinct teaching styles, and comprehending the individual characteristics of each student to effectively connect with them (Lee et al., 2021). The reform of physical education teaching needs to develop in a diversified, multi-level, and personalized direction to meet the needs of students' physical education learning (Wang & Zhang, 2018). With the deepening of teaching reform, the quality of undergraduate teaching in universities has greatly improved (Chen et al., 2020).

However, the traditional teaching mode is single, usually focusing on students' physical skills and movement norms, but neglecting students' focus (Li & Liu, 2019). The lack of interactive innovation in classroom content leads to a lack of opportunities for students to actively participate and think; causing students to lose motivation and interest in learning, affecting their learning outcomes and engagement (Wu & Zhou, 2021). The traditional teaching model focuses on the teaching of the entire class, thus ignoring the differences and needs of individual students (Zhang et al., 2017). The traditional teaching model lacks targeted evaluation and guidance, and cannot provide effective after-school supervision and feedback (Wu & Wang, 2019). Therefore, the traditional "textbook", "teacher", and "classroom" three center teaching model can no longer meet the needs of modern education, and people are beginning to pay attention to sports teaching models based on innovative perspectives (Gao et al., 2022). There is a need to explore an innovative perspective based physical education teaching model to better adapt to the needs of contemporary students, improve the quality and efficiency of physical education teaching, and contribute to the comprehensive growth and development of students (Xu & Li, 2023). In recent years, the BOPPPS teaching model has also received widespread attention from the Chinese academic and educational communities (Zhu et al., 2020). The BOPPPS teaching model has not only been studied in China, but has also been introduced into the training and teaching practice of university teachers (Yang & Chen, 2021).

Universities in China have made certain innovations in mastering student skills and systematic organizational knowledge (Huang & Wu, 2022). In response to the limitations of traditional teaching models, researchers need to combine the BOPPPS model with traditional teaching models to explore more effective physical education teaching models, in order to better stimulate students' learning motivation, provide personalized learning support, and improve the quality and efficiency of physical education teaching (Wang et al., 2024). Although there are many practical studies on the application of the BOPPPS teaching model to university teaching in China, most of them are applied to teaching in subjects such as physics, mathematics, field of medicine and English. There is very little practical research on the application of the BOPPPS teaching model to physical education teaching for university students (Cheng et al., 2023). Therefore, this study combines the BOPPPS teaching model with traditional teaching methods and applies it to the teaching practice of physical education teaching for university students, and compares its effectiveness with traditional teaching methods. And combined with the teaching practice of physical education courses, summarize the feasibility and limitations of the new blended teaching model (Zhang & Liu, 2022).

The BOPPPS teaching model originated from the Instructional Skill Workshop (ISW) project in British Columbia, Canada in the 1970s. Based on constructivism and communicative approach, it emphasizes student-centered teaching processes and effectively enhances students' participation in classroom teaching. In 2011, the teaching mode of BOPPPS was introduced into China, and in 2021, the teaching mode of BOPPPS was gradually promoted and applied in China. Yulou et al. introduced

the BOPPPS teaching model in the teaching of general surgery, dividing interns into two groups. One group was the experimental group (using the BOPPPS teaching model), and the other group was the control group (using the traditional teaching model). According to the research results, the case analysis results of the experimental group were higher than those of the control group, the preparation time before class was longer than that of the control group, the number of active speeches was higher than that of the control group, and the teaching satisfaction of the experimental group was 96.88%, The experimental satisfaction of the control group was 74.19%, and the satisfaction of the experimental group was higher than that of the control group. The application of BOPPPS teaching mode in medical field courses can achieve significant results and high teaching satisfaction.

Chen J et al. (2019) used the BOPPPS teaching mode in the "College Computer" course and selected two liberal arts classes. One was set as the experimental class, using the BOPPPS teaching mode, and the other was set as the control class, using the traditional teaching mode. Finally, by comparing the level of knowledge mastery, 94.55% of the students in the experimental class basically mastered the explanation content, while only 72% of the students in the control class basically mastered the content. Wen L et al. (2018) applied the BOPPPS teaching model to the "Electronic Technology" course. Based on the analysis of students' characteristics and job needs, typical cases were introduced into the teaching process to clarify goals, improve the interactive process, and design reasonable assessment methods. During the execution process, students showed high interest in learning, good participation, and teachers had a better understanding of students' situations.

Zhou (2018) conducted applied research on the "BOPPPS+PAD" model in the "Business Scenario Translation" course, using the BOPPPS teaching model as the classroom design framework. In the participatory learning stage, the PAD model was applied: the teacher briefly explained the key and difficult points based on the results of the pre test stage, then assigned tasks to each student, and finally conducted group discussions and mutual Q&A, When each student completes a task, they can think independently and digest the content taught. Group discussions can also deepen and master the learning content through collision of ideas. Through post testing, it was found that the average score of the experimental group before receiving blended learning mode was  $76.650 \pm 9.016$  points, while the control group had  $77.530 \pm 9.710$  points. However, after using blended learning mode, the average score of the experimental group increased to  $86.630 \pm 5.304$  points, while the control group had  $79.280 \pm 10.982$  points. From the results, it can be found that adopting blended teaching can significantly improve students' grades, reducing overall differences among students. However, students using traditional teaching methods have a smaller improvement in scores, and there is a significant difference between students.

Although there have been many practical studies on the application of the BOPPPS teaching model in university teaching in China, most of them are applied to the teaching of engineering disciplines such as medicine, physics, and English. There is relatively little research on the application of BOPPPS teaching mode in physical education teaching in universities. There is less research on the correlation between innovative teaching models and optimizing participation in physical education both inside and outside the classroom. Therefore, this study applies the BOPPPS blended teaching model to the design of teaching practice in college students' physical education teaching, and extends to the correlation study of college students' extracurricular physical activity participation. This not only verifies the feasibility of using the BOPPPS teaching model in physical education teaching, but also provides more practical experience for innovative new models of physical education teaching, Propose more strategies to optimize the participation of college students in extracurricular sports activities.

In physical education teaching, extracurricular (out of class) sports activities are an effective way to achieve sports goals and tasks, which complement physical education teaching and are indispensable organizational forms of school physical education. Physical education teaching and extracurricular (out of class) sports activities are inseparable. (Yu, 2019) Physical education teaching in universities must be combined with extracurricular activities, and all extracurricular activities on campus can

serve as supplements or extensions to the classroom, truly achieving integration inside and outside the classroom (Zhao, 2019). Physical education teaching in universities is an important stage in guiding students to master the correct and scientific means and methods of physical exercise, and also a crucial period in cultivating students' lifelong physical awareness and promoting lifelong physical exercise (Song, 2019). On the premise of offering good physical education and health courses, actively organize and guide students to participate in extracurricular sports activities, promote students to apply the professional sports knowledge and skills learned in the classroom to extracurricular sports exercises, sports club activities, and sports competitions, truly optimize students' sports participation, and cultivate students' lifelong sports awareness (Liu 2016). Although many scholars have proposed relevant research and analysis on the reform of physical education teaching, most of them start with theoretical knowledge and lack effective experimental data to verify and explore effective teaching models and strategies, neglecting the tracking research of classroom course learning on the participation of in class and extracurricular physical activities (Zhou, 2018).

This study aims to amalgamate the benefits of BOPPPS teaching methodology and conventional teaching within the framework of physical education curriculum overhaul. It endeavors to devise case-based teaching approaches for university-level physical education courses, seeking to pioneer innovative teaching methodologies. Additionally, it delves into the practical application of these methods in classroom settings. Furthermore, it investigates the potential influence of this novel teaching approach on students' engagement in extracurricular sports activities, with the ultimate goal of enhancing university students' involvement in sports. By doing so, it aims to offer valuable insights for the development of new educational paradigms in university-level physical education, fostering students' enduring awareness and appreciation for lifelong sports participation

Lifelong sports is an important development direction of modern sports. (Li, 2014) The so-called lifelong sports refers to introducing the concept of lifelong sports into a person's mind, allowing the concept of lifelong sports to deeply exist in their hearts, and then providing lifelong sports education to their thoughts, making sports an indispensable part of people's daily lives (Guo, 2014). This study also extends physical education beyond the classroom through innovative physical education teaching models, improve students' participation in extracurricular sports activities, focus on cultivating students' lifelong physical education abilities, and truly implement lifelong physical education.

## **2. STATEMENT OF THE PROBLEM**

This study aims to optimize the participation of college students in sports and explore effective teaching models and strategies. Specifically, it attempts to answer the following questions:

- (1) What is the profile of the sophomore student- respondents in terms of the following:
  - 1) Sex
  - 2) Age
  - 3) Sports Elective
- (2) What is the assessments of the sophomore student- respondents on the following (BOPPPS) teaching model in their PE class?
  - 1) Bridge in, Objective, Pre assessment and cognitive engagement;
  - 2) Participant Learning and Behavioral Participation;
  - 3) Post assessment and effect participation; and
  - 4) Summary and Emotional participation
- (3) Is there a significant difference in the assessment of the sophomore student-respondents' in physical education participation of BOPPPS when their profile is taken as test factor?

(4) What are the assessments of the sophomore students' participation in the following out of class sports activities ?

1) Interest and Motivation Participation

2) Habits and Plan Participation

3) Attitude and Behavior Participation

(5) Is there significant difference in the assessment of the sophomore student-respondents in physical education participation of BOPPPS and their out of class sports activities?

(6) Is there a significant relationship between college students participation in physical education of BOPPPS and their out of class sports activities?

(7) Based on the research results, what enhanced pedagogical approaches of PE can be developed?

### **3. HYPOTHESIS**

This study tested the following hypotheses at a 0.05 level of significance:

Ho1. There is no significant difference in the assessment of the sophomore student-respondents' in physical education participation of BOPPPS when their profile is taken as test factor.

Ho2. There is no significant difference in the assessment of the sophomore student-respondents in physical education participation of BOPPPS and their out of class sports activities.

Ho3. There is no significant relationship between college students participation in physical education of BOPPPS and their out of class sports activities.

### **4. SCOPE AND DELIMITATION**

This study mainly explores the new sports teaching mode and the situation of college students' sports participation, as well as whether the new teaching mode has a positive impact on optimizing college students' sports participation. The BOPPPS blended teaching model in this article is mainly applied to the physical education teaching of sophomores. The selected course content mainly includes basketball, volleyball, and aerobics. Due to limitations in classroom time and teachers, this study cannot create more teaching examples. Although the selection of classes is random sampling, in reality, although the principle of sports elective courses is to respect students' interests and hobbies for free selection, in reality, due to the limited number of students in each elective course, the courses that individual students have to choose are not their true favorite sports projects. Therefore, there are certain differences in the selected research subjects, which may lead to some bias in the final questionnaire survey results.

The focus of this article is to verify the correlation between the implementation of a blended teaching model that combines BOPPPS teaching mode and traditional teaching mode and the optimization of college students' sports participation. However, due to the fact that classroom evaluation is obtained through interview questionnaires and is influenced by subjective consciousness, the representativeness of the research is insufficient. Given that teachers have different levels of understanding of the BOPPPS hybrid model and the different effects produced during the implementation process, it will affect the depth and breadth of the final research results.

### **5. RESEARCH DESIGN**

This article uses academic websites such as CNKI, SCI, ACS, and EBSCO to conduct literature search on keywords such as BOPPPS teaching mode, physical education teaching, and extracurricular

sports activities. By fully utilizing various big data platforms and related books, the collected literature on the application of the BOPPPS teaching model was analyzed, compared, and summarized, laying a theoretical foundation for the writing of this article.

This study will adopt a quantitative-descriptive correlational data collection and analysis to improve the comprehensiveness and credibility of the research results. Quantitative analysis will collect data through teacher evaluations, including students' athletic ability level test scores, knowledge level test scores, and classroom physical activity participation. This study utilized descriptive statistics and correlation analysis to analyze quantitative data, in order to explore the correlation between the implementation of the BOPPPS hybrid teaching model and college students' participation in out of sports activities. Quantitative data was analyzed using statistical software such as SPSS, including descriptive statistics and correlation analysis.

Research site: Xinyang Normal University, located in Xinyang City, Henan Province, is the first undergraduate university established in Henan Province after China's reform and opening up. It is one of the two key normal universities under construction in Henan Province and a member of the University Alliance in the Dabie Mountain Revolutionary Old Area. The school currently has two campuses, Tanshan and Huaihe, covering an area of over 2500 acres. The total construction area of the campus is over 900000 square meters, with 24 colleges and 83 undergraduate enrollment majors; Has 16 first level disciplines authorized for master's degrees and 14 types of master's degree authorization; There are over 1900 faculty members; There are a total of 23876 full-time students on campus, including 1690 graduate students.

## 6. SAMPLING METHOD

Overall and sampling plan: no more something about experimental.

This study select 365 out of 7000 total population using Qualtrics calculator; 365 students from 2 male and 4 female classes in their sophomore year at Xinyang Normal University as the survey subjects. Due to the gender ratio of 1:2 in Xinyang Normal University and the adoption of a course selection system for public physical education courses, three sports majors will be selected: **basketball, volleyball and aerobics** . Applying the BOPPPS blended teaching mode to the teaching of physical education the Classroom Participation Scale" (including Bridge in, Objective, Pre assessment and cognitive engagement, Participant Learning and Behavioral Participation, Post assessment and effect participation, Summary and Emotional participation), the "Extracurricular Participation Scale" (including interest and motivation, habits and plans, attitudes and behaviors), Then, teachers would conduct a comprehensive quantitative evaluation of their participation in physical education both in and out of class.

In order to maintain the objectivity of the research, the same sports project is taught by the same teacher using different teaching modes and selecting the same content for teaching.

## 7. RESEARCH INSTRUMENT (VALIDATION)

Questionnaire survey:

This study utilized a researcher -made questionnaire as the main data collection tool to study the required data and information.

Firstly, the questionnaire design of this study is based on extensive literature review and expert opinions. When designing the content and dimensions of the questionnaire, researchers carefully considered factors related to physical education classroom teaching and out of class physical activities. The expert group consisted of sports experts and teachers, who repeatedly discussed and reviewed the content and questions of the questionnaire to ensure the accuracy of converting abstract concepts

into specific indicators and questions. They made the questionnaire more detailed and comprehensive. The reliability of the questionnaire was tested using a retest method for small-scale preliminary testing. After the questionnaire was completed, it was distributed to 5 teachers and 20 students for testing. After an interval of 5 days, the same test paper was retested, and repeated revisions were made based on the opinions of physical education teachers and students. Efforts were made to effectively reflect the main purpose and content of the study and ensure that the questionnaire met high requirements in terms of validity. The researchers conducted a detailed analysis of each dimension and made necessary adjustments based on the results to ensure good consistency and reliability in each dimension of the questionnaire. Based on the above evaluation results, the researchers made necessary modifications and improvements to the questionnaire. After repeated review and modification, it was determined that the final version of the questionnaire had good effectiveness and reliability, and could accurately measure the key dimensions of whether the implementation of the BOPPPS blended teaching model could promote the optimization of college students' sports participation.

The questionnaire consists of four parts, with the first part covering the gender, age, and sports major of the respondents. The second part of this scale is the Physical Education Classroom Participation Scale, which consists of three dimensions: cognitive participation, emotional participation, and behavioral participation. The third part is the out of class sports activity participation scale, which includes three dimensions: attitude and cognition, behavior and effect, interests and hobbies, as well as the sports scale.

## **8. DATA GATHERING PROCEDURE**

The data collection process includes the following steps:

Firstly, develop a classroom sports participation questionnaire, including cognitive participation, emotional participation, and behavioral participation; Extracurricular sports participation questionnaire, including interest and motivation, habits and plans, attitudes and behaviors, and extracurricular sports exercise scale; Secondly, the questionnaire will be distributed to students and teachers participating in experimental teaching through online links. Before conducting a survey, the consent of the respondents will be obtained and the anonymity and confidentiality of the questionnaire will be ensured. At the end of the test, all participants will receive a small gift as a token of gratitude.

Finally, after the experiment, experimental data was obtained by filling out a scale to elucidate the relationship between different variables, validate the effectiveness of implementing the teaching model in curriculum teaching, analyze the promoting effect of the BOPPPS blended teaching model on optimizing college students' sports participation, and form research conclusions and propose research suggestions and strategies.

On this basis, we will use SPSS software for one-way ANOVA to investigate whether the teaching model has a promoting effect on optimizing college students' sports participation, and use independent sample T-test to compare the changes in male and female students' classroom participation after implementing the BOPPPS mixed teaching model; Clarify the relationship between different variables, analyze and compare them, and draw conclusions to explore whether the BOPPPS blended teaching model can improve the participation of college students in physical education teaching? Is the participation of students in sports activities better than that of students implementing traditional teaching models when implementing teaching models?

## 9. RESULTS AND DISCUSSION

This chapter contains a tabular representation of the data collected, as well as its analysis and interpretation. The conclusions in this section are based on a statistical analysis performed with SPSS version 27. As a result, the findings, as well as their interpretation and analysis, are presented.

(1) Profile of the sophomore student- respondents in terms of the following:

**Table 1.** Profile of the Respondents

Profile		Frequency	Percent
Sex	Male	122	33.50%
	Female	242	66.50%
	Total	364	100%
Age	18	61	16.80%
	19	162	44.50%
	20	141	38.70%
	Total	364	100%
Sports Elective	Basketball	122	33.50%
	Volleyball	122	33.50%
	Aerobics	120	33.00%
	Total	364	100%

Presented in the table are the profile of the respondents as to sex, age, and sports elective. As to Sex: There are 364 individuals in total. 122 individuals (33.50%) are male, while 242 individuals (66.50%) are female. This indicates that there are more females than males in the group.

As to Age: The data is segmented into three age groups: 18, 19, and 20. Among these groups, the largest age group is 19, with 162 individuals (44.50%). The smallest age group is 18, with 61 individuals (16.80%). The 20 age group has 141 individuals (38.70%). As to Sports Elective: The data shows preferences for three different sports electives: basketball, volleyball, and aerobics. Each sport seems to be equally popular as each has 122 participants, making up 33.50% of the total each. This suggests that the population has an equal preference for these three sports electives. Interpreting this data further: Gender Imbalance: There's a notable gender imbalance, with females constituting a larger proportion of the sample compared to males. This could be due to various factors such as the nature of the program, survey biases, or societal trends. Age Distribution: The majority of participants fall into the 19-year-old category, suggesting either a specific age range targeted by the program or survey, or simply a reflection of the demographics of the population being studied. Sport Preferences: The equal distribution of participants across the three sports suggests that there's no significant preference for one sport over the others within this group. This could imply that the program or survey is appealing to a diverse range of interests or that the availability of sports electives is evenly promoted.

## 10. CONCLUSION

Based on the findings of the study, the following are concluded:

- (1) The study reveals a predominance of females and 19-year-olds among participants, with a relatively equal distribution across sports electives.
- (2) The study demonstrates that all components of the BOPPS model, including Bridge in, Objective, Pre-assessment, Cognitive Participation, Participant Learning and Behavioral Participation, Post-assessment and learning outcomes, and Emotional Participation, are perceived as effective in involving students in PE classes;
- (3) The study indicates that the components of the BOPPS model yield insignificant differences when analyzed based on respondents' sex, age, and elective choices. Thus, the null hypothesis is accepted.
- (4) The participation of the respondents to out of class sports activities such as Interest and Motivation Participation, Habits and Plan Participation, and Attitude and Behavior Participation was found to be effective in maintaining PE as sports for the students.
- (5) The participation of respondents in out-of-class sports activities, including Interest and Motivation, Habits and Plans, and Attitude and Behavior, did not vary significantly across different demographic groups when analyzed by sex, age, and electives.

The profound significant relationship between the four elements of BOPPPs (Bridge in, Objectives, Pre-assessment and cognitive engagement, Participation Learning and Behavioral Participation, Post-assessment and effect Participation, and Emotional Participation) and respondents' participation in extracurricular sports pursuits, encompassing Interests and Motivation, Habits and Plans, and Attitude and Behavior, necessitates the rejection of the null hypothesis.

## 11. RECOMMENDATIONS

Based on the conclusions of the study, the following are recommended:

- (1) Implement targeted outreach strategies to engage a more diverse demographic and consider tailoring program offerings to better accommodate varying interests within sports electives.
- (2) Utilize the BOPPS model consistently in educational settings, emphasizing its efficacy in facilitating comprehensive learning experiences across various domains.
- (3) Further investigation is warranted to explore potential factors influencing the effectiveness of the BOPPS model beyond demographic characteristics, such as teaching methods, classroom environment, and individual learning styles.
- (4) Encouraging continued engagement in out-of-class sports activities could further enhance overall participation and its positive effects on individuals' interest, motivation, habits, plans, attitudes, and behaviors.
- (5) Despite the lack of significant differences, it is crucial to continue promoting inclusivity and diversity in sports participation to ensure equitable access and opportunities for all individuals regardless of their demographic characteristics.
- (6) Emphasizing and integrating the BPPPOs framework into sports education programs can enhance participants' interest, motivation, habits, plans, attitudes, behaviors, and overall engagement in out-of-class sports activities, leading to more effective outcomes.

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