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Research Article

Ways to Improve the Efficiency of P.E. Teaching in Colleges and Universities Based on Behavior Characteristics*

Wei Ni¹*Inner Mongolia Medical
University*Juan Liu²*Inner Mongolia Medical
University*Yongfei Yu³*Inner Mongolia Medical
University*

Abstract

In view of the uneven level of P.E. teaching in colleges and universities, this study explores ways to improve the efficiency of P.E. teaching based on behavior characteristics. First of all, through the way of questionnaire, this study deals with the teaching behavior characteristics of senior physical P.E. teachers and ordinary P.E. teachers. Then, this study compares and analyzes the differences in behavior characteristics between the two groups of teachers. Finally, taking behavior characteristics of senior P.E. teachers as the benchmark, this study finds out the shortcomings of behavior characteristics of ordinary P.E. teachers and puts forward the corresponding improvement methods. By improving behavior characteristics of ordinary P.E. teachers, the teaching quality of ordinary P.E. teachers can be effectively improved, which is expected to improve the efficiency of P.E. teaching in colleges and universities as a whole. The research results of this study provide a clear way of improving the efficiency of P.E. in colleges and universities based on behavior characteristics, which is of great practical significance to improve the overall level of P.E. in colleges and universities, improve the physical quality of college students, as well as to promote the transformation of the ideas of higher education development.

Keywords

Behavior Characteristics • P.E. Teaching • Higher Education • Improvement of Efficiency

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¹ Inner Mongolia Medical University, Physical Education Department, Hohhot 010110, China. Email: tongxiuqing@126.com

² Correspondence to: Juan Liu, Inner Mongolia Medical University, Physical Education Department, Hohhot 010110, China. Email: 502884010@qq.com

³ Inner Mongolia Medical University, Physical Education Department, Hohhot 010110, China. Email: wyfnn@163.com

In order to solve the problem of uneven level of P.E. teaching in colleges and universities and further improve the teaching level of P.E. in colleges and universities, this study conduct an in-depth exploration on the way of improving the efficiency of P.E. in colleges and universities based on behavior characteristics.

At the end of last century and the beginning of this century, the statistical analysis method was gradually introduced into the research of P.E. in colleges and universities. Quantitative research makes the analysis of the teaching process more flexible, and also makes the teaching experience of P.E. in colleges and universities scientifically expressed and popularized (Manross & Templeton, 1997; Martin & Kulinna, 2005). In order to effectively improve the efficiency of P.E. teaching in colleges and universities, some researchers focus on the modeling of teaching behavior characteristics of senior P.E. teachers (Morgan, Kingston & Sproule, 2005); some researchers focus on the modeling of interaction between teachers and students from the point of view of communication between P.E. teachers and college students (Gallé *et al.*, 2015); some researchers deconstruct and analyze the teaching behavior characteristics of P.E. teachers in colleges and universities based on the perspective of college students (Sinelnikov, 2009); some researchers group P.E. teachers in colleges and universities according to their ages and conduct cluster analysis on the teaching behavior characteristics of teachers at different ages (Murcia, Lacárcel & Álvarez, 2010); some researchers conduct a comprehensive analysis on the positive and negative factors in improving the teaching behavior of P.E. teachers in colleges and universities (Kimball, Jenkins & Wallhead, 2009). Although the predecessors have done a lot of useful research work, they more or less ignore the research on ordinary P.E. teachers.

In order to effectively improve the overall level of P.E. teaching in colleges and universities, this study takes ordinary P.E. teachers group as the main research object, points out the shortcomings of behavior characteristics of ordinary P.E. teachers, and puts forward the corresponding improvement methods through the difference analysis of behavior characteristic between this group and senior P.E. teachers. The follow-up investigation shows that the improvement methods proposed in this study can effectively improve the teaching quality of ordinary P.E. teachers. The research results of this study provide a clear way of improving the efficiency of P.E. in colleges and universities, which is of great significance to promote the transformation of the ideas of higher education development.

Part 1 is introduction; Part 2 introduces the design method of the questionnaire on behavior characteristic of P.E. teachers; Part 3 analyzes the differences in behavior characteristic between ordinary P.E. teachers and senior P.E. teachers; Part 4 puts forward the ways to improve the efficiency of P.E. in colleges and universities based on the shortcomings of behavior characteristics of ordinary P.E. teachers; Part 5 is the conclusions.

Design of Questionnaire on Teaching Behavior Characteristics of P.E. Teachers

Subject of questionnaire

This study collects teaching behavior characteristics of P.E. teachers in four universities in Shaanxi Province by means of questionnaire. According to the results of year-end assessment and peer review in the last three years, all P.E. teachers are divided into two groups: senior P.E. teachers and ordinary P.E. teachers. Different

from the previous methods of identifying senior P.E. teachers, this study does not regard the age factor as the basis for the identification of senior P.E. teachers, but takes the business performance as the only measurement index. This method makes the classification of P.E. teachers more scientific and the collection of teaching behavior characteristics more credible. In the collected valid questionnaire, 25 senior P.E. teachers and 25 ordinary P.E. teachers are randomly selected and taken as the practical research object to collect the teaching behavior characteristics.

Compilation of questionnaire

The contents of the questionnaire are very important to the follow-up research work, so this study not only designs the questions carefully on the basis of the predecessors, but also increases the number of questions so as to collect the subtle differences between different teachers groups more accurately. The contents of the questionnaire come from three channels. The first is to draw lessons from the research achievements at home and abroad in the past three years (Cancela & Ayán, 2010; Jenkins & Alderman, 2011; Hayes, Capel, Katene & Cook, 2008). The second is to listen to the opinions of experts in the field of P.E. teaching in domestic colleges and universities, and the third is based on the survey results of the domestic college students. Through the induction of various aspects of information, the first draft of the questionnaire is prepared, and then we ask for advice from P.E. teachers and college students to complete the first draft to form the final questionnaire. The final questionnaire consists of 150 choice questions, each of which includes six options, namely “always”, “sometimes”, “medium”, “basically not”, “never” and “not sure”. The homogeneity reliability of the questionnaire is 0.973, the reliability retested a month later is 0.857 ($p < 0.01$) and the validity coefficient is 0.624. There are many questions, so we need to explain or train the investigation subject before filling out the questionnaire in order to guarantee the investigation effect. In addition, this study uses Matlab software to carry out analysis on the questionnaire result.

A Comparative Analysis of behavior Characteristics of Different Teachers Groups

Behavior characteristics of senior P.E. teachers

From the analysis of the questionnaire result, behavior characteristics of senior P.E. teachers are obtained objectively. The teaching behavior characteristics mainly consist of three parts: behavior characteristics at the class preparation stage, behavior characteristics at the teaching stage, and behavior characteristics at the after-class stage. By means of principal component analysis (PCA), the indicators of teaching behavior characteristic in each stage are decoupled and compared, and the most important 4 indicators are obtained. The indicators and their values are shown in Table 1.

Behavior characteristics of ordinary P.E. teachers

Like the way in 3.1, behavior characteristics of ordinary P.E. teachers are also obtained through the analysis of the questionnaire result. The teaching behavior characteristics of ordinary P.E. teachers are also composed

of three stages: class preparation, teaching and after-class. Through PCA, the most important four indicators and their values in each stage are obtained, and the results are shown in Table 2.

Table 1
Indicator Values of the Teaching Behavior Characteristics of Senior P.E. Teachers

Stage	Indicator number	Indicator name	Indicator value (%)
Preparation stage	1	Awareness of students	83.1
	2	Familiarity with teaching objectives	86.5
	3	The level of detail of the teaching plan	87.7
	4	The completeness of teaching equipment	96.8
Teaching stage	5	Mastery of teaching progress	84.7
	6	Agitating ability of college students' interest in learning	92.4
	7	Ability to give students time	80.4
	8	Demonstration ability of teaching difficulties	97.5
After class stage	9	Keep abreast of the learning outcomes of students	85.3
	10	Answer students' after-school questions in a timely manner	89.3
	11	Individual counseling for failing students	93.8
	12	Reflecting and improving future teaching	98.2

Table 2
Indicator Values of the Teaching Behavior Characteristics of Ordinary P.E. Teachers

Stage	Indicator number	Indicator name	Indicator value (%)
Preparation stage	1	Awareness of students	64.7
	2	Familiarity with teaching objectives	80.5
	3	The level of detail of the teaching plan	74.2
	4	The completeness of teaching equipment	94.3
Teaching stage	5	Mastery of teaching progress	80.5
	6	Agitating ability of college students' interest in learning	73.6
	7	Ability to give students time	74.4
	8	Demonstration ability of teaching difficulties	64.3
After class stage	9	Keep abreast of the learning outcomes of students	65.0
	10	Answer students' after-school questions in a timely manner	63.9
	11	Individual counseling for failing students	75.1
	12	Reflecting and improving future teaching	59.6

Comparison of behavior characteristics between senior P.E. teachers and ordinary P.E. teachers

By comparing the indicator values of each teaching stage in Table 1 and Table 2, it is found that behavior characteristics of senior P.E. teachers and ordinary P.E. teachers have obvious differences in the class preparation stage, teaching stage and after-class stage. In the class preparation stage, behavior characteristic indicator value of senior P.E. teachers is higher than that of ordinary P.E. teachers. Among them, the most obvious difference is "the understanding degree of teaching object". The indicator value of senior P.E. teachers is 83.1% while that of ordinary P.E. teachers is only 64.7%. This shows that senior P.E. teachers will pay attention to collecting the information of teaching object before formal teaching in order to teach according to their aptitude to ensure the achievement of teaching goals. In the teaching stage, the difference of behavior characteristic indicator value between senior P.E. teachers and ordinary P.E. teachers is more obvious than that in the class preparation stage. For example, for the indicator of "demonstrative ability of teaching difficult points", the indicator value of senior P.E. teachers is 97.5% while that of ordinary P.E. teachers is only 64.3%,

indicating that senior P.E. teachers generally have high professional quality and rich teaching experience, and can complete the standard teaching demonstration action for teaching difficult points, which is very important for P.E. teaching. In the after-class stage, the difference of behavior characteristic indicators between senior P.E. teachers and ordinary P.E. teachers is more obvious than the first two stages. For example, the indicator of “reflecting and improving teaching in the future” is 98.2% for senior P.E. teachers and only 59.6% for ordinary P.E. teachers, which indicates that senior P.E. teachers generally have good professional spirit. After finishing teaching, they can still think about the new problems in the teaching actively, and summarize the experience and lessons in time so as to further improve the teaching level.

Ways to Improve the Efficiency of P.E. Teaching in Colleges and Universities Based on Behavior Characteristics

Shortcomings of behavior characteristics of ordinary P.E. teachers

Taking behavior characteristics of senior P.E. teachers as the benchmark, this study analyzes the differences between behavior characteristics of ordinary P.E. teachers and senior one, as shown in Table 3.

Table 3
Teaching Behavior Characteristic Indicator Values Difference between Ordinary and Senior P.E. Teachers

Stage	Indicator number	Difference between indicator values (%)	Average of the difference at each stage (%)
Preparation stage	1	18.4	10.10
	2	6.0	
	3	13.5	
	4	2.5	
Teaching stage	5	12.2	17.55
	6	18.8	
	7	6.0	
	8	33.2	
After class stage	9	20.3	25.75
	10	25.4	
	11	18.7	
	12	38.6	

Table 3 gives an intuitive quantitative presentation of the shortcomings of behavior characteristics of ordinary P.E. teachers. As can be seen from Table 3, in all the teaching stages, the smallest difference is the “completeness of teaching equipment” (only 2.5%) in the class preparation stage, and the largest difference is the “reflecting and improving future teaching” (38.6%) in the after-class stage. As a whole, the difference of behavior characteristics in the class preparation stage is the least significant (10.10%), the difference in the teaching stage is middle (17.55%), and the difference in the after-class stage is most significant (25.75%). Therefore, we should pay more attention to the improvement of behavior of ordinary P.E. teachers in the after-class stage while improving their behavior according to the difference of the quantitative indicators.

Methods to improve behavior characteristics of ordinary P.E. teachers

Table 4
Improvement Methods of Teaching Behavior Characteristics of Ordinary P.E. Teachers

Stage	Indicator number	Improvement method
Preparation stage	1	Communicate with students in advance to understand the student's learning interests and physical condition.
	2	Study the syllabus carefully, and carefully consider the original intention of setting the teaching objectives.
	3	Based on the experience of previous teaching, decompose the movements of physical education techniques.
	4	Develop a good habit of checking teaching equipment before class and eliminate potential sports injury hazards.
Teaching stage	5	Quickly reach a consensus with the students and complete the interaction under the framework of consensus.
	6	Based on previous experience, stimulate students' desire to participate through questions and demonstrations.
	7	Ensure the student's practice time through a short and efficient teaching and explanation.
	8	Master the various demonstration actions through the constant hard work.
After class stage	9	Understand the students' achievement of teaching goals through testing and other means
	10	Communicate with students after class, encourage students to ask questions
	11	Learn about student achievement, and arrange time for individual counseling for students with poor grades
	12	Accumulate experience and lessons in a timely manner by writing logs, group discussions, etc.

For each characteristic indicator of teaching behavior, this section gives the corresponding methods to improve behavior of ordinary P.E. teachers, as shown in Table 4.

It can be seen from Table 4 that the corresponding teaching behavior improvement methods are given for each characteristic indicator of teaching behavior. Of course, according to the actual situation of ordinary P.E. teachers, the improvement methods given in this study can be changed and detailed appropriately. It is found that the improvement methods can achieve obvious results in a short period of time, and improve behavior characteristics of ordinary P.E. teachers to a relatively stable level after 4 months.

Analysis on the overall improvement effect of P.E. teaching efficiency in colleges and universities

The behavior characteristics of senior P.E. teachers have been at a relatively high level, so the key to improve the overall efficiency of P.E. teaching in colleges and universities is to improve the teaching behavior of ordinary P.E. teachers. Through the follow-up study of ordinary P.E. teachers, it is found that the teaching behavior of their behavior changes obviously after one month of implementation of the improvement methods. 4 months later, the teaching efficiency of the group rises to a relatively stable level as a whole. The indicator values before and after the improvement of teaching behavior characteristics of ordinary P.E. teachers are shown in Table 5.

Table 5
Comparison of Indicator Values before and after Teaching Behavior Characteristics Promotion of Ordinary P.E. Teachers

Stage	Indicator number	Indicator value of senior P.E. teachers (%)	Indicator value of ordinary P.E. teachers before promotion (%)	Indicator value of ordinary P.E. teachers after promotion (%)
Preparation stage	1	83.1	64.7	75.4
	2	86.5	80.5	87.8
	3	87.7	74.2	82.6
	4	96.8	94.3	98.4
Teaching stage	5	92.7	80.5	87.6
	6	92.4	73.6	78.2
	7	80.4	74.4	77.1
	8	97.5	64.3	79.0
After-class stage	9	85.3	65.0	72.5
	10	89.3	63.9	81.1
	11	93.8	75.1	82.9
	12	98.2	59.6	85.1

As can be seen from Table 5, although behavior characteristics of ordinary P.E. teachers are significantly improved after the implementation of the improvement methods for 4 months, and even are superior to senior P.E. teachers in some indicators (such as “the familiarity degree of teaching objectives” and “completeness degree of teaching apparatus”), there is still a gap between behavior characteristics of senior P.E. teachers and ordinary ones on the whole. This also indicates that, in addition to the rapid improvement of individual behavior characteristics, the significant improvement of most behavior characteristics still requires a long-term accumulation of time and experience.

Conclusion

This study explores how to improve the efficiency of P.E. teaching based on behavior characteristics. Firstly, the teaching behavior characteristics of senior P.E. teachers and ordinary P.E. teachers are collected by questionnaire. Then, taking behavior characteristics of senior P.E. teachers as the benchmark, this study analyzes the shortcomings of behavior characteristics of ordinary P.E. teachers, and gives the corresponding improvement methods. The follow-up investigation also shows that after a period of time, behavior characteristics of ordinary P.E. teachers have been effectively improved. This study focuses on improving the teaching efficiency of ordinary P.E. teachers so as to achieve the overall objective of improving the efficiency of P.E. teaching in colleges and universities. At the same time, the research results of this study also provide important practical significance for improving college students' physical quality and promoting the transformation of idea of higher education development.

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