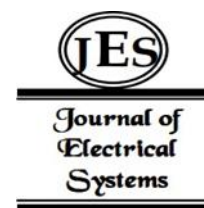


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## Digital Technology: Research on the Construction and Application of Blended Teaching Curriculum of Practical Physical Education Classroom Teaching Skills in the Big Data Background



**Abstract:** - Big data is bringing discipline to education. Under the guidance of digital technology, education has ushered in the upsurge of digital reform, digital course teaching has gradually entered the public's vision, and the upsurge of digital course open education is coming. The paper adopts the research methods of literature, field investigation and logical analysis, and takes the construction of digital curriculum mixed teaching course based on the platform of Superstar Learning as the research object. This paper constructs the curriculum construction ideas in three stages of "pre-class, mid-class and after-class", and draws the following conclusions through the research of blended teaching curriculum practice in the big data background: Build digital media teaching resource library, record multi-platform online teaching videos, practice dual-track mixed teaching, pre-set interactive classroom teaching activities, after-school homework to consolidate and improve classroom learning, online examination to achieve teaching effect evaluation and feedback, etc. And summed up four practical experiences of multi-style one-click check-in function to help class attendance, interactive teaching activity function to achieve subject participation, paperless online evaluation function to detect learning effect, digital courses to break the limitation of time and space. Digital technology improves the convenience of course teaching and forms a visual teaching effect. Digital technology provides new ideas for digital curriculum teaching. The existence of digital curriculum provides more possibilities for personalized learning, while hybrid teaching promotes the interaction and cooperation between students and teachers. Build an online learning platform based on big data to support computer technology, and guide students to conduct simulation and practice in the teaching process.

**Keywords:** Big Data, Digital Technology, Teaching Skills, Chaoxing Learning APP, Mixed Teaching, Digital Curriculum

### I. INTRODUCTION

In the past decade, digital technology has occupied an important position in curriculum education, but there are few relevant studies on the combination of digital technology and curriculum, and the research on "digital ability" as a new thing into the field of education is also very few. [1]. Digital competence is key for students in the 21st century [2]. The emergence of digital technology has changed the pattern of world education, the reform of digital education has become a new outlet, and the application of digital technology has also brought new thinking to teaching. The application of digital technology is gradually changing the fields related to it, and the field of education is also facing new opportunities and challenges. The functions of online education system include teaching videos, teaching materials, exercises, tests, experiments, discussions, etc. The basic modules of database layer can be determined according to these functions [3]. Therefore, how to make good use of digital technology reform to realize the digital construction of sports courses has become a hot topic. Traditional physical education teaching relies too much on oral teaching and field guidance, but this way has the limitation of time and space, and often cannot meet the needs of students for personalized learning. The introduction of digital technology makes teaching more flexible and diversified, and provides more abundant learning resources and interactive ways, which helps to stimulate students' learning interest and enthusiasm. Curriculum construction is an important step of talent training and the main channel for sports talents to learn [4]. The research focuses on the construction of online + offline blended teaching courses of Practical Physical Education Classroom Teaching Skills, and explores effective digital course teaching strategies and implementation methods, aiming to provide feasible reference experience for the construction and promotion of digital courses of mixed teaching.

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## II. "PRACTICAL PHYSICAL EDUCATION CLASSROOM TEACHING SKILLS" COURSE OVERVIEW AND CONSTRUCTION IDEAS

### A. *Overview of Practical Physical Education Classroom Teaching Skills*

Practical Physical Education Classroom Teaching Skills is an extension of School Physical Education. It is a compulsory course for physical education teachers. The main objective of the course is to enable normal physical education students to fully master various skills required by front-line physical education teachers in middle and primary schools, and to cultivate students' ability of teaching design, implementation and operation. And through lecture, simulation class and other forms to demonstrate. This course expounds the skills application methods and requirements required in each link of physical education teaching activities, designs targeted training links, combines the skills competition of normal physical education students as one of the assessment basis, and strives to build a teaching model of "project-oriented course content, task-based course implementation, and productized teaching assessment". Through the study of this course, students will be able to master sports teaching design, introduction skills, explanation and demonstration skills, questioning skills, diagnosis and error correction skills, body language skills, classroom organization skills, lesson evaluation skills, lesson closing skills and other special skills, which will lay a solid foundation for the future teaching work of physical education teachers. Relevant studies have shown that digital ability is very important for teachers, but it is a pity that digital ability has not been paid enough attention to and is not regarded as an integral part of teachers' professional ability.[5].

With the rapid development of education in China, the basic equipment of education has reached the world's leading level. As a future PE teacher, it is necessary to have a certain degree of digital literacy and digital learning ability.

### B. *"Practical Physical Education classroom Teaching skills" Mixed Teaching Curriculum Construction Ideas: "Online + Offline" Dual-track System*

2006 was a year of special significance for "digital competencies", which the European Union included as one of the eight key competencies for lifelong learning. [6]. There is little consensus about the nature of teachers' digital competencies in Higher Education [7]. It is obvious that China has recognized the huge development space of digital technology for higher education curricula, and has also officially closed the gap with developed countries in digital education. In order to narrow the gap with developed countries in the digitization of education, China has made many attempts. The "Online + offline" blended teaching course of Practical Physical Education Classroom Teaching Skills (Figure 1) deeply and organically integrates online autonomous learning and offline face-to-face classroom teaching, which is a trinity practice and attempt of "teacher teaching, student learning and teaching research". In terms of the application platform of digital courses, as a well-known digital education service platform in China, Chaoxing Learning APP provides teachers and students with a variety of online learning resources and learning tools, and provides a good basic environment for the digital transformation of physical education courses. Based on the background of modern information technology, the "online + offline" mixed teaching mode organically combines traditional teaching (Face to Face) and online teaching (E-Learning) to form a new teaching mode [8]. By establishing teaching activities that combine various methods in the teaching process, students' enthusiasm for learning can be aroused, which is a measure to ensure the basic requirement of "students are the main body in the teaching process and teachers are the leaders in the teaching process", and at the same time to ensure that students have sufficient thinking time and exploration space. In order to avoid the problem of one-sided classroom teaching content, teachers can synchronize online courses through online teaching platforms and provide students with two-dimensional codes synchronized with teaching content to learn [9]. This teaching method has achieved certain results, which provides all-round convenience for students' pre-class preview, learning in class and review after class, and can meet the practical needs of the innovative teaching mode of integrating theory and practice in physical education major.

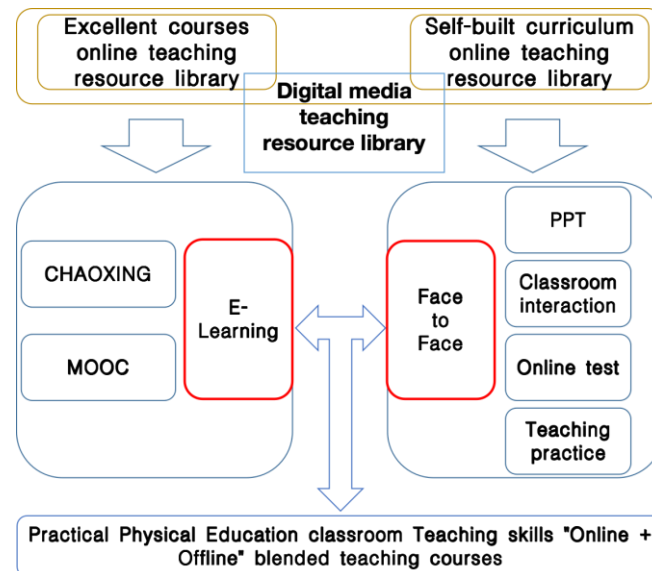


Figure 1: "Practical Physical Education Classroom Teaching Skills" "Online + Offline" Mixed Teaching Course Construction Ideas

### III. BASED ON SUPER STAR LEARNING: "PRACTICAL PHYSICAL EDUCATION CLASSROOM TEACHING SKILLS" AND "ONLINE + OFFLINE" BLENDED TEACHING COURSE PRACTICE

According to the time logic of curriculum practice, the construction of digital curriculum is divided into three steps: (1) pre-class stage; (2) the middle stage of the lesson; (3) After school stage, each stage corresponds to different construction tasks.

#### A. Pre-class Stage

##### 1) Build digital media teaching resource library

Digital media teaching resource library is a centralized teaching resource management platform that integrates existing media materials and teaching resources through digital media. The digital media library was developed to allow users to search, preview, and link content to the course website in an integrated Virtual Learning environment (IVLE), with digital resources roughly divided into audio, video, images, and clip art, which are presented in digital form. [10]. The construction of digital media teaching resource library is studied and analyzed in depth from the aspects of demand analysis, technology platform selection, information architecture design, media production and arrangement, resource uploading, review and management. Its role is to meet the integration of "online + offline" blended teaching curriculum resources. The digital media teaching resource library of "online + offline" blended teaching course Practical Teaching Skills in Physical Education is constructed and put into use in accordance with the following six steps: determining the scope and classification of the teaching resource library, selecting a carrier platform with complete functions and wide usage rate, designing the information architecture of the teaching resource library, processing and integrating the existing digital media teaching resources, practicing and promoting the operation of the digital media teaching resource library, and improving and refining the digital media teaching resource library. After the initial construction of the digital media teaching resource library of the "Online + Offline" mixed teaching course "Practical Physical Education Classroom Teaching Skills" was completed, it was still deployed and integrated in the use of teaching team members, and finally formed the digital media teaching resource library of this course, and applied in teaching practice. Through a series of teaching practice feedback of this course in recent years, the construction of digital media teaching resource library is not achieved overnight. Through the construction of digital media teaching resource library, the utilization efficiency of teaching resources can be effectively improved. At the same time, it is also necessary to pay attention to the publicity and operation of teaching resource library, improve the usage and influence, in order to maximize the role of digital technology in teaching, and further guarantee the teaching quality of "online + offline" dual-track teaching.

##### 2) Record multi-platform online teaching videos

The global public health crisis triggered by the COVID-19 pandemic has not only brought about a social and economic crisis, but also brought changes to education, and the traditional education model has been broken. The inclusion of digital capabilities in education is no longer an option, it is not an optional response, but a

prerequisite and a necessary choice for the digital transformation of education. [11]. Learning through the Internet has become the second major way of learning after classroom teaching. The multi-platform online teaching video of the "online + Offline" blended teaching course is a part of the teaching resource library, and the recording of the teaching video is the basic premise for the realization of "online + offline" mixed teaching, and it is a teaching mode that combines practicality and innovation. The teaching videos of this course are organized and classified by chapter as a supplement to the teaching resources of digital media. Multi-platform online teaching video recording needs to pay attention to and follow the requirements of popularization of technical equipment selection, comprehensive teaching video production, compatible teaching platform use, teaching video arrangement and standardization of recording process management. Multi-platform online teaching video recording can help effectively solve the problem of limited audience scope of offline teaching and improve students' learning enthusiasm. Multi-platform online teaching video is a supplement and perfection of offline classroom teaching, a good channel for students to preview before class and review after class, and also makes up for the disadvantages of poor theoretical teaching effect, giving students more learning channels and opportunities for improvement. Multi-platform online teaching video recording refers to the teaching video recorded on the online teaching platform combined with offline course teaching, so that students can watch and learn the teaching content of offline courses on multiple platforms in an online way.

### *B. Middle Stage of Lesson*

#### *1) Practice dual-track curriculum mixed teaching*

"Online + Offline" hybrid teaching is a dual-track parallel classroom teaching, which integrates online teaching and offline teaching organically and applies them into classroom teaching practice. It is a teaching method that combines the advantages of online education and traditional education, and has some unique advantages and characteristics. The "online + offline" blended teaching mode can not only break the time and space gap between teachers and students, but also greatly meet the personalized learning needs of students. It can also activate the classroom atmosphere, enhance classroom interaction, and weaken the sense of distance between teachers and students [12]. Learners can access a large number of educational resources through the Learning-Pass online learning platform, providing a diverse learning experience to help students gain a wider range of knowledge and more skills. All educational resources on the online learning platform can be freely accessed by students, and students can adjust their learning progress according to their own learning habits and learning abilities, saving time and human resources, improving the educational effect and improving the educational efficiency. In addition, the "online + offline" hybrid teaching can also optimize the teaching organization, through the combination of online platform and offline practice, classroom teaching is more diversified and flexible. Through the Learn-Pass teaching platform, students can choose and complete homework independently, and the classroom can be more used for interaction, exploration and practice. Blended teaching also encourages students to be more involved, through a variety of teaching activities such as classes, discussions and demonstrations, students actively participate in the classroom and learn more skills and knowledge.

#### *2) Preset interactive classroom teaching activities*

The presupposition of interactive classroom teaching activities refers to the pre-designed by teachers according to the teaching objectives and course contents, including various interactive teaching forms and activity contents to promote effective classroom interaction and help students better understand and digest the knowledge and skills they have learned. In fact, the computer network-based teaching platform has a system to monitor students' progress, which makes it easy and intuitive for teachers to see the improvement of students' learning level. [13]. "Online + Offline" blended curriculum teaching has the characteristics of interaction, through a variety of teaching activities preset to achieve the interaction between teachers and students, students and students, in order to reflect the improvement of their class participation. After clarifying the teaching objectives, the presupposition of class organization should be made, the teaching objectives should be determined, and how to achieve these objectives through interactive activities should be considered. According to different themes and contents of each class, the organizational forms and teaching activities that match the teaching contents should be designed, including the teaching activities with strong participation such as group discussion and role playing. Prepare corresponding teaching resources according to the preset class activities, ensure that the teaching resources match the interactive teaching form, and design a variety of interesting and challenging classroom interactive activities on this basis, ensure that each activity link of students can adapt to the teaching content of this class, and combine the interactive activities in class with students' learning results for demonstration and evaluation. To achieve the effect of gradually realizing the purpose of teaching. Interactive classroom teaching

activity presets can make teaching more targeted, improve students' enthusiasm and activity in teaching, promote teacher-student interaction, and form a good teaching experience and learning atmosphere.

### *C. After-school Stage*

#### *1) Homework to consolidate and improve classroom learning*

Homework is a supplement to and improvement of learning in class. It can not only deepen students' understanding and mastery of the knowledge and teaching skills, but also test the learning effect while students make full use of the homework after class. Teachers need to properly set the difficulty of homework, strengthen the homework design, and guide students how to effectively complete the homework in order to achieve better teaching results. "Homework helps students improve their academic performance," according to research [14].

Homework is a very important part of Chinese students' course teaching, and proper completion of homework can effectively review knowledge. This course is based on the mixed teaching of "Online + offline" and "Practical Physical Education Classroom Teaching Skills". The design and completion of homework plays an important role in consolidating and improving the classroom learning effect. Reasonable homework content should be designed for each chapter, and a variety of question types should be set to ensure that the homework content is consistent with the learning objective. Homework content should have a certain difficulty trend, which can promote students' in-depth understanding of the learning content and strengthen their memory. Teachers should check and evaluate homework, give feedback on homework in time, optimize the interaction effect of homework, and focus on explaining and answering problems existing in homework in the next class teaching. Consolidating and improving the classroom learning effect is very important in homework. Students need to purposefully use online learning resources and make full use of offline time for practical operations.

#### *2) Evaluation and feedback of teaching effect through online examination*

The "online + offline" blended teaching course of Practical Physical Education Classroom Teaching Skills is an attempt based on the digital platform. The emergence of online examination increases the convenience and timeliness of teaching evaluation and feedback, which helps to better evaluate the teaching effect and optimize it in time. As we all know, digital technology relies on the Internet to transmit information. The ICT infrastructure remains a significant barrier to the successful completion of online exams under secure, proctored conditions, and its reliability is a prerequisite for the smooth conduct of exams. [15]. First, teachers can use online exams to collect data on students' learning outcomes and performance, including knowledge mastery and understanding. Secondly, through data collection and analysis, teachers can find students' problems and teaching deficiencies in time, and adjust and improve teaching strategies in time. At the same time, online exams can also promote students' independent learning and participation, and communicate and interact with online interactive and discussion platforms to increase students' understanding and application of knowledge. Teachers use online teaching platforms to provide diversified teaching content and resource sharing, and realize audio-visual teaching, graphic teaching, online live broadcasting and other forms of classroom teaching and after-class question-answering services. Online examination is an effective means to test students' learning results in "online + offline" blended teaching courses, which can effectively improve the effectiveness and quality of classroom teaching, and is also a more efficient teaching evaluation and feedback means.

## IV. BASED ON THE PRACTICAL EXPERIENCE OF "ONLINE + OFFLINE" BLENDED CURRICULUM CONSTRUCTION OF "PRACTICAL PHYSICAL EDUCATION CLASSROOM TEACHING SKILLS" BY SUPER STAR LEARNING

"Practical Physical Education Classroom Teaching Skills" "online + offline" hybrid teaching course, based on the Super star learning platform for dual-track teaching, this course has been practiced in many colleges and universities in Guangxi, China, and has become a benchmark course for regional digital curriculum construction, which is an attempt to use teaching practice data to support teaching results. This course has a one-year teaching practice cycle, during which 24 classes have been taught, 1409 students have been served, 14 course chapters have been set up, 54 digital course resource libraries have been uploaded, 1092 classroom teaching activities have been conducted, 6,161 student discussions have been organized, and 2 digital examinations have been conducted. (Source: School of Sports and Health Science, Xiangsihu College of GuangXi Minzu University)

### *A. Diversified One-click Check-in Functions Help Class Attendance*

When students are faced with a large number of students, the inability to judge absence is a problem faced by all teachers. The use of noticing routines is an innovation designed to help create positive student-teacher relationships, increase student attendance, assist with student success in the classroom, and ultimately help increase on-time graduation rates [16]. One-click check-in function is a convenient tool to help teachers achieve

classroom attendance, including positioning check-in, photo check-in, graphic check-in, scanning check-in and other forms, which is an efficient and convenient auxiliary function. Traditional paper sign-in sheets require teachers to manually record students' attendance, which is inefficient and prone to errors, while the sign-in methods based on multiple one-click sign-in tools can improve the accuracy and efficiency of sign-in, and support multiple forms of sign-in methods, providing more convenience for teachers. Multiple sign-in methods can be achieved by scanning two-dimensional code, sign-in code and other technologies. Such applications can improve the accuracy of sign-in, speed up the speed and accuracy of sign-in, and provide instant sign-in feedback information and statistical report functions, which is convenient for teachers to evaluate and feedback teaching effects. It can be seen that the application of multi-style one-click check-in tools can help teachers more efficiently check in class attendance, and provide more convenience and personalized customization functions.

#### *B. Interactive Teaching Activities Function to Achieve Subject Participation*

Interactive teaching activities can realize the interaction of teaching subjects, and the realization of subject participation is one of the core elements of interactive teaching activities. In order to realize the effective participation of subjects in the teaching process, interactive teaching needs to provide various forms of teaching activities and interactive mechanisms, set classroom debates according to the teaching content, achieve flipped classroom in the form of group cooperation reports, and diversify teaching activities to encourage students to participate more in classroom teaching and improve students' learning ability and comprehensive quality. At the same time, interactive teaching also needs the support of multimedia technology and teaching tools to enhance the interest of classroom teaching and enhance students' sense of participation and experience. From the perspective of teaching practice, especially emphasizing the main role of students, improving the level of classroom interaction to promote the integration of teacher-student relationship, creating conditions for classroom interaction, and then improving the control ability of teacher-student interaction to enhance students' interactive language ability[17]. In addition, interactive teaching also requires teachers to have good teaching design and practical abilities, to develop scientific and effective teaching plans according to students' needs and learning characteristics, and to motivate students to actively participate in classroom activities. The realization of subject participation is one of the key elements of interactive teaching activities, which requires teachers to provide support in various forms and personalized customization functions, as well as scientific and effective teaching design and practice ability, so as to create a positive, open and free teaching environment and stimulate students' learning enthusiasm and initiative.

#### *C. Paperless Online Evaluation Function to Detect the Learning Effect*

Paperless online evaluation is a way to realize teaching evaluation using educational technology. Compared with the traditional paper test, the paperless online evaluation has more advantages, which can detect the learning effect of students more accurately and quickly, and plays an important role in teaching evaluation. The implementation of the paperless examination can make up for these shortcomings, produce the obvious and comprehensive benefits, realize the separation of the teaching and the testing, is conducive to the evaluation of the teachers' teaching quality and the teaching effectiveness, and improve the teaching quality and efficiency [18]. Paperless online evaluation can provide more types and more diversified test questions, which can better reflect the real learning level of students, and measure the learning effect of students more objectively and comprehensively. Second, paperless online assessments can provide more accurate and faster results. After students complete the test, the system can automatically score and generate test results and reports, so as to timely feedback students' learning results, knowledge mastery and understanding and application ability of teaching content. In addition, paperless online evaluation can improve teaching efficiency and quality. Students submit test answers online, and teachers can read and evaluate students' answers on the network, which not only reduces teachers' work burden, but also improves teaching efficiency. At the same time, the automatic statistics and analysis of evaluation results and the immediate feedback of student assessment can help teachers to understand the learning situation of students in time, and track and sort out the knowledge points in class in time. The teaching method of decision tree method can effectively implement the system and monitor the previous possible challenges in real time, so as to avoid possible problems.**Error! Reference source not found.** The paperless online evaluation function can help teachers detect the learning effect of students, and provide more accurate, rapid and personalized evaluation and feedback on students' achievements and performance, so as to provide better teaching services for students.

#### D. Digital Courses Break the Constraints of Time and Space

Digital curriculum is a hybrid education mode supported by educational technology, which digitizes classroom resources through the Internet, multimedia, virtual experiments and other forms, breaking the restrictions of time and space, and can be learned anytime, anywhere and across national boundaries. With the development of modern education technology, the popularization of computer network has been able to support the paperless examination, and the network-based paperless examination is more and more applied in the education scene. Therefore, a new online and offline hybridized education mode formed with both advantages of online education and traditional education [20]. The "online + offline" hybrid teaching course of Practical Physical Education Classroom Teaching Skills is built based on Superstar Learning, which has typical characteristics of digital courses. Digital courses have unlimited time and space, which can greatly facilitate students' learning and enable learners to learn at anytime and anywhere according to their personal and work arrangements. The phenomenon of not being able to attend classes due to time and space constraints is avoided. Students no longer need to arrive at school in accordance with fixed curriculum arrangements, and can arrange their own learning steps according to their own needs and time, freely choose learning content and learning time, providing students with a more flexible and convenient way of learning. In addition, digital courses can also cross geographical limits, and students can connect to the Internet from anywhere. This flexibility allows the school to attract learners from all over the world, design and teach courses on a global scale, make full use of resources, expand its reach and enhance its competitiveness. Teaching platform based on the network, as a new instructional mode has become a hot topic in online teaching [21]. The digital curriculum has the characteristics of breaking the time and space constraints, and provides a broader educational opportunity for all types of schools at all levels, which can help students more easily acquire knowledge, realize self-learning and improve growth. The application of this method can improve the flexibility and efficiency of students' learning, promote international academic and cultural exchanges, and promote the development of practical physical education classrooms.

#### V. CONCLUSIONS

Through the rational use of digital technology to promote the innovation and optimization of physical education teaching model, improve the learning effect and experience of students, and further promote the in-depth application of digital China strategy in the field of physical education. Practice has proved that the reform and attempt of the "online + offline" mixed teaching course "Practical Physical Education Classroom Teaching Skills" have achieved phased results. This is an opportunity for digital technology to innovate and try the teaching mode, which breaks the conventional teaching barriers and is an effective teaching mode, which can effectively improve students' learning effect and course participation. We will further ensure the quality of teaching. In the future, with the continuous development of digital technology, the academic community has reason to believe that digital transformation will play a more important role in sports professional courses, and provide strong support for cultivating more excellent sports talents. Big data technology has become a good helper of digital education, and the digitalization of education has become a reality based on big data.

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