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Exploring the U-T-S Joint Cultivation Model in Master'S Degree Physical Education Practice

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Abstract: *In recent years, the traditional master's degree program in sports education has faced challenges, including insufficient collaboration between internal and external tutors and a lack of emphasis on practical aspects. To address these issues, a joint cultivation model called U-T-S (university-industry alliance-small and school) has been proposed to enhance the quality of Master of Physical Education (M.P.E.) education. The U-T-S model integrates resources from universities, industry alliances, and small and medium-sized schools to cultivate high-level applied physical education talents. Experimental research methods were used to investigate and practically explore the U-T-S model at the Hunan University of Technology. Feedback from administrators, tutors, employers, and students has shown that the U-T-S model effectively enhances students' practical ability, professionalism, and employment competitiveness. The study also identifies challenges, such as coordinating interests and improving cooperation mechanisms in practical implementation. Consequently, several improvement strategies have been proposed, including strengthening policy support, optimising cooperation mechanisms, and establishing incentive mechanisms. This study provides a new cultivation model and practical experience for the education of specialised Master of Physical Education, as well as a reference for the reform and innovation of other professional degree education.*

Keywords: *U-T-S; Master of Physical Education; Higher Education*

1. Introduction

The specialised Master of Physical Education has gained increased attention from academics and professionals due to its practicality and relevance [1]. However, the current training model for specialised master's degrees in sports faces several challenges. For example, the existing U-S (universities and primary and secondary schools) model meets the Ministry of Education's requirements for professional degrees that focus on practical training [2]but lacks enthusiasm, and the quality of education falls short of expectations in the long run. On the other hand, the U-U (universities and universities) model needs to establish practical cooperation due to the lack of complementary capacities between the parties involved. While the U-G-S (universities, government, and primary and secondary schools) model introduces the government as a strong coordinator, limited government participation hinders practical results [3]. Therefore, it is crucial to develop a new joint training model to address these challenges and enhance the quality of master's degree programs in physical education.

In this paper, we propose and explore the joint training model of the U-T-S (Universities, Industry Alliances, and Primary and Secondary Schools). This model introduces the industry alliance into the collaboration between universities and primary and secondary schools to address the limitations of the existing model, increase the engagement of all parties, and enhance the practical skills and employment competitiveness of Physical Education Master students [4]. As a connection between education and career guidance, the industry alliance can establish an effective cooperative relationship between universities and primary and secondary schools [5]. The U-T-S joint cultivation model proposal has theoretical significance and crucial practical value. The U-T-S model is based on the cooperative education theory, stakeholder theory, and the theory of postgraduate training model, emphasising the coordination of all party's interests and establishing cooperative mechanisms [6].

Furthermore, the U-T-S model provides new ideas and methods for the education of specialised Masters of Physical Education and addresses practical issues in the current training model through specific implementation and impact assessment. This paper systematically researches the implementation process and effect of the U-T-S joint training model through action research and experimental research methods. The study includes investigation and problem analysis of joint cultivation for the master's

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degree in physical education, construction and implementation of the U-T-S model, evaluation of the implementation effect, and strategies for addressing existing issues. Through these studies, this paper aims to offer practical and effective joint cultivation models for the education of Master of Physical Education and to provide references for other colleges and universities.

The innovation of this study is that the industry alliance is introduced into the training system of the Master of Physical Education for the first time. The U-T-S joint training model is proposed, and its effectiveness is verified through practice. The results of the study are not only of great significance to the education of master of physical education but also provide new insights into the joint cultivation mode of other professional degree education. It is hoped that the research in this paper can promote the further reform and development of specialised master's degree education in sports, improve the cultivation quality of specialised master's degree students in sports, and cultivate more high-level applied talents for the country.

2. Background to the study

The main goal of sports master education is to train practical and professional talents with high-level practical skills [7]. Unlike traditional academic master's education, sports master's education focuses more on developing practical skills and application abilities [8]. However, the current joint cultivation model for a sports master's degree has encountered several practical problems and struggles to meet the diverse social needs. Some issues include ineffective communication and collaboration between internal and external tutors, limitations in utilising social resources, and challenges students face, such as inadequate guidance and limited practical opportunities for internships and employment. Therefore, there is a need to explore and implement a new joint cultivation model to address these urgent challenges.

2.1. Limitations of existing joint training models

There are three main models for joint cultivation of a master's degree in physical education in China: U-S, U-U, and U-G-S. The U-S model has poor cultivation effects in operation due to systematic compartmentalisation and resource imbalance between colleges, universities, and primary and secondary schools. The U-U model faces challenges in achieving expected goals due to the non-complementary capacity of colleges and universities. The U-G-S model involves the government as a coordinator, but sustained government involvement is low, resulting in limited effectiveness of the model's operation. The above models suffer from insufficient motivation, poor communication, and unsatisfactory guidance during implementation. A new model is urgently needed to solve these problems.

2.2 Advantages of the U-T-S joint training model

The U-T-S joint training model introduces industry alliances as a new subject of cooperation. It aims to mobilise the enthusiasm of all parties and promote in-depth collaboration between universities, industry alliances, and primary and secondary schools. Industry alliances can provide students with practical resources and play an essential role in career guidance and employment. This model allows colleges and universities to enhance their practical teaching capabilities by leveraging the resources and experience of industry alliances. Primary and secondary schools can improve the quality of physical education teaching through cooperation with colleges and industry alliances. Furthermore, industry alliances can participate in the education process to cultivate talents that meet the needs of the industry. The U-T-S model emphasises the common interests of all parties and ensures that all parties can obtain actual benefits through the design of the benefit distribution mechanism and the cooperation mechanism. It also focuses on combining theory and practice and continuously optimises and improves the cultivation program to ensure its effectiveness. Finally, the model emphasises innovation by introducing the industry alliance as a new subject of cooperation, providing a new idea for education and cultivation.

3. Theoretical foundations

The construction and practice of the U-T-S joint cultivation model is an essential exploration of the education of sports speciality and a necessary innovation in theory. This paper discusses the theoretical basis of the U-T-S joint training model in detail, focusing on three aspects: cooperative education theory, stakeholder theory, and graduate training model theory.

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3.1 Theories of Co-operative Education

Cooperative Education Theory (CET) emphasises the active participation of students, teachers, and external partners in the education process to integrate education and practice sincerely. The theory originated in the United States at the beginning of the 20th century. Its core idea is that through cooperative education, students can closely connect academic learning and practical work to enhance their vocational ability and social adaptability. In the U-T-S joint cultivation model, colleges and universities, industry alliances, and primary and secondary schools are the main cooperative subjects in cultivating students with a specialised master's degree in physical education. Guided by the theory of cooperative education, the U-T-S model emphasises that colleges and universities provide academic support and primary theory education, industry alliances offer career guidance and practice opportunities, and primary and secondary schools provide specific teaching practice platforms. Through tripartite cooperation, students with a master's degree in physical education can acquire systematic theoretical knowledge in colleges and universities and accumulate rich practical experience in actual working environments, thus improving their comprehensive quality and career competitiveness.

3.2 Stakeholder theory

In 1984, R. Edward Freeman proposed the Stakeholder Theory, which emphasises that organisations should consider the interests of all groups and individuals they have relationships with, not just the shareholders. This theory is used in education to analyse and resolve conflicts of interest and coordination among different educational entities. In the U-T-S joint training model, colleges, universities, industry alliances, and primary and secondary schools are the main stakeholders, each with different interests. Colleges and universities aim to enhance the quality of training for students with master's degrees in sports and improve employment rates and social reputation. Industry alliances seek high-quality professionals and increased influence by participating in the educational process. Primary and secondary schools want to enhance teaching quality and teacher professionalism with the support of college and industry resources. Stakeholder theory offers a practical analytical framework for the U-T-S model, facilitating identifying and coordinating all parties' interests and building a mutually beneficial cooperation mechanism. This model establishes a transparent communication mechanism and cooperation agreement to ensure a balanced interest allocation and optimal resource allocation for maximum benefits.

3.3 Theory of Postgraduate Training Models

The Graduate Education Model Theory (GEMT) primarily discusses the goals, contents, and methods of graduate education. Its core focus is to balance theoretical learning and practical training to cultivate high-quality applied talents. As society's demand for high-level applied talents grows, more than the traditional single academic training model is needed. Graduate education is evolving towards diversification and practice, and the U-T-S joint training model is an innovative approach to graduate training. Under this model, students pursuing a master's degree in sports receive systematic academic training in colleges and universities and engage in practical work and teaching practice in industry alliances and primary and secondary schools. This training mode enables students to master a solid theoretical foundation, accumulate rich practical experience, and develop more competitive professional abilities. The "tripartite joint" training concept within the U-T-S mode deepens and expands the theory of postgraduate training mode, breaking the traditional on-campus training mode and integrating academic education, vocational training, and teaching practice. This creates an all-round and multi-level growth platform for Master of Physical Education and Sport students, promoting the comprehensive improvement of their quality and professional ability.

The theory of cooperative education, stakeholders, and postgraduate training mode together form the theoretical foundation of the U-T-S joint training model. These theories provide a scientific basis for constructing the U-T-S model and offer theoretical guidance for its implementation. In practice, through tripartite cooperation and leveraging their respective advantages and resources, the existing joint training model's challenges can be effectively resolved, improving the quality of specialised master students' sports training and cultivating more high-level applied talents for the country and society.

4. Methods

This study was registered with the institutional research office and received full ethical approval

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It aims to thoroughly investigate and apply the U-T-S joint cultivation model in the education of sports masters. To achieve this, we will combine action research and experimental research methods. This approach will allow us to comprehensively understand the specific issues and outcomes of the joint cultivation model. We will also be able to validate its effectiveness through experiments and offer scientifically grounded suggestions for improving physical education masters' education.

The experimental research method involves systematically observing and measuring the impact of an intervention on subjects by controlling variables and establishing control and experimental groups. This method is highly scientific and reproducible, providing reliable data for research. In our study, the experimental research method will primarily assess the implementation effect of the U-T-S joint training model. Our research subjects are students with master's degrees in physical education at Hunan University of Technology. The experimental group will undergo the U-T-S joint cultivation mode, while the control group will follow the traditional U-S cultivation mode. We will compare differences in practical ability, professionalism, and employment competitiveness by setting identical learning objectives and assessment criteria for both groups. This will help us evaluate the effectiveness of the U-T-S model. In the specific implementation process, students in the experimental group will participate in practical activities within industry alliances and primary and secondary schools, along with receiving theoretical education in colleges and universities. The industry alliances will provide vocational training and internship opportunities, while the primary and secondary schools will arrange for physical education teaching practice. The experiment will continue for one academic year, during which we will collect data through questionnaires, interviews, and field trips. Subsequently, we will analyse the data statistically to validate the training effect of the U-T-S model.

5. Process

The study's process involves preliminary investigation and problem analysis, the construction and implementation of the U-T-S model, and the evaluation and improvement of the model's effects. This process encompasses all aspects of the experimental research method to guarantee the study's systematic and scientific nature.

5.1 Preliminary investigation and problem analysis

The study initially used questionnaires and semi-structured interviews to comprehend the current situation and issues of the existing joint cultivation model of internal and external tutors for the master's degree in physical education. The survey respondents included teachers of physical education majors at the Hunan University of Technology, experts from industry alliances, primary and secondary school teachers, and current physical education master's degree students. The questionnaire covered the cultivation objectives, faculty, dissertation, internship practice, curriculum, assessment and evaluation, and cultivation effect. Interviews, on the other hand, were conducted to obtain more detailed qualitative data through in-depth communication with administrators, tutors, and employers.

The findings revealed that the existing U-T-S model faces numerous challenges, such as insufficiently close cooperation between on- and off-campus tutors, lack of systematic practice sessions, and limited enhancement of students' practical abilities. These problems provide an essential basis for constructing a new U-T-S model.

5.2 Construction and implementation of the U-T-S model

The research team began constructing and implementing the U-T-S joint training model based on the preliminary investigation. Firstly, the physical education programme of Hunan University of Technology, relevant industry alliances and primary and secondary schools were selected as the cooperation units. Then, a cooperation agreement was signed with all parties to clarify their respective responsibilities and tasks. Next, several training sessions and workshops were organised to ensure all parties understood and agreed with the U-T-S model. In terms of implementation, the U-T-S model includes the following key components:

- Mentor selection and training: Experienced mentors are selected from universities, industry associations, and primary and secondary schools, and systematic training is provided to ensure that they

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are equipped to mentor students with a Master's Degree in Physical Education.

- Design of practical courses: A series of valuable courses and programmes are designed according to the characteristics of the U-T-S model, covering physical education and sport teaching, research and training, and career guidance.

- Joint training mechanism: Establishing a regular communication mechanism between universities, industry alliances, and primary and secondary schools, as well as holding regular joint training meetings to discuss and resolve problems encountered in the training process.

5.3 Evaluation of the effectiveness of implementation

After implementing the U-T-S model for some time, we assessed its effectiveness through experimental research. We selected two groups of Physical Education Master's degree students - one as the experimental group that adopted the U-T-S model and the other as the control group that continued using the traditional U-S model. We compared the two groups in terms of academic achievement, practical ability, career quality, and employment situation to evaluate the effect of the U-T-S model. The data analysis showed that students using the U-T-S model significantly outperformed those using the U-S model in practical ability, vocational quality, and employment competitiveness. Furthermore, qualitative interviews and observation records revealed that the U-T-S model had significant advantages in improving students' practical ability, promoting mentor cooperation, and enhancing the overall quality of education.

5.4 Continuous improvement and optimisation

Based on the assessment results, the research team continuously improved and optimised the U-T-S model. Specific measures include adjusting the curriculum of practical courses, strengthening tutor training, and improving the joint training mechanism. Through this process, the effectiveness and operability of the U-T-S model will be continuously improved to provide a basis for further promotion.

6. Discussion

Through exploring and practising the U-T-S joint training model, we have achieved significant research results in several areas. The following are the main findings and discussions of this study.

6.1 Effectiveness of the U-T-S model in enhancing practical skills

The U-T-S joint cultivation model greatly enhances students' practical ability with a master's degree in sports by integrating the resources of colleges and universities, industry alliances and primary and secondary schools[9]. Compared with the traditional U-S cultivation model, the U-T-S model pays more attention to the design and implementation of practical aspects so that students can exercise and improve their abilities in a natural working environment.

First of all, with the support of the industry alliance, students can obtain more vocational training and internship opportunities. The industry alliance provides students with abundant practical resources and professional guidance to help them better understand the industry's needs and workflow and master valuable skills[10]. For example, during the internship, students were involved in the organisation and management of sports events, using and maintaining sports equipment, and promoting and publicising sports programmes. These practical activities enhance students' professional ability and improve their professionalism and comprehensive quality. Secondly, in the teaching practice in primary and secondary schools, students can apply the theoretical knowledge they have learnt to actual teaching. With the support of primary and secondary schools, students have accumulated rich teaching experience in the actual teaching process, which has enhanced their teaching ability and educational level. By observing and participating in actual teaching activities, students can better understand and master the basic methods and techniques of physical education teaching and develop good teaching ability and communication skills. Finally, the theoretical education of universities provides students with a solid knowledge base. University tutors in the U-T-S model impart professional knowledge and help students combine theory and practice through case studies, special lectures and practical teaching to improve their comprehensive analytical and problem-solving abilities.

The U-T-S joint training model has achieved remarkable results in enhancing the practical ability of

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students with a master's degree in physical education. Students not only accumulate rich practical experience in vocational training and internships but also improve their teaching ability and educational level in teaching practice. Meanwhile, the close integration of theory and practice has led to the overall improvement of students' comprehensive quality and professional competitiveness.

6.2 Effectiveness and problems of inter-agency co-operation

In implementing the U-T-S joint training model, the cooperation between universities, industry alliances and primary and secondary schools plays a key role[11]. Each of the three main parties has played its advantages in the cooperation, which has jointly promoted cultivating students with a specialised degree in physical education. However, some problems have been exposed in the collaboration process, which needs to be further improved and perfected.

Firstly, colleges and universities play a central role in joint training [12]. Colleges and universities are responsible for formulating training programmes, organising theoretical teaching and coordinating resources. In the implementation process, tutors of colleges and universities actively participate in the guidance of students and maintain close communication and cooperation with industry alliances and primary and secondary schools to ensure that the training objectives are achieved. However, due to the differences between universities and industry alliances and primary and secondary schools in terms of management systems, working methods and cultural backgrounds, problems of miscommunication and coordination difficulties inevitably arise in cooperation. These problems have affected the effectiveness of joint training to a certain extent. Secondly, industry alliances are essential in providing vocational training and internship opportunities. The professional resources and rich practical experience of industry alliances strongly support students' career development[13]. However, due to the differences in management mechanisms and operation modes of enterprises and organisations in industry alliances, students may encounter problems such as unclear work tasks and insufficient guidance during internships. In addition, the motivation of industry alliance instructors to participate and the level of guidance needs to be improved, which needs to be addressed through further training and incentives. Finally, primary and secondary schools play an essential role in teaching practice[14]. Primary and secondary schools provide students with an authentic teaching environment, enabling them to practise and enhance their teaching abilities in actual teaching[15]. However, due to the limited teaching resources in primary and secondary schools, students may need more teaching equipment and homogeneous teaching content in their teaching practice. These problems must be solved by strengthening cooperation with universities and industry alliances to share resources and experience.

The cooperation among universities, industry alliances and primary and secondary schools in the U-T-S joint training model has achieved remarkable results. Still, there are also some problems that need to be solved urgently. By further strengthening the tripartite cooperation and optimising the cooperation mechanism, the advantages of each subject can be better utilised, and the overall effect of joint training can be enhanced.

6.3 Improvement Strategies for Existing Problems

To further improve the U-T-S joint training model and solve the problems encountered in the implementation process, this paper proposes the following improvement strategies:

Firstly, communication and coordination between universities, industry alliances and primary and secondary schools should be strengthened. Colleges and universities should establish a regular communication mechanism and organise regular joint meetings among representatives of the three parties to share experiences and findings and solve problems encountered during cooperation. Through the establishment of a transparent communication mechanism and collaboration agreement, the balance of interests of all parties is ensured, and the optimal allocation of resources and maximisation of benefits are achieved. Secondly, industry alliance mentors' participation enthusiasm and guidance level should be improved. Universities and industry alliances should work together to formulate training plans for mentors, organise regular training and exchange activities, and enhance industry alliance mentors' teaching and mentoring abilities. At the same time, an incentive mechanism should be established to recognise and reward industry alliance tutors with excellent performance and stimulate their enthusiasm for participation and sense of responsibility. Third, optimise the allocation of teaching resources in primary and secondary schools. Colleges and universities should establish a resource-sharing mechanism with primary and secondary schools, provide necessary teaching equipment and resource support, and help them improve their teaching conditions. In addition, primary and secondary schools should design

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rich and diversified teaching practice activities according to the actual needs of students to improve their teaching ability and education level. Fourth, the evaluation and feedback mechanism must be strengthened. Colleges and universities should establish a scientific evaluation system to comprehensively assess the cultivation effect from multiple dimensions, such as students' theoretical knowledge, practical ability and professionalism. Through questionnaires, in-depth interviews, and field visits, feedback from students, tutors, and employers can be collected in a timely manner, problems in the cultivation process can be analysed and summarised, and targeted improvement measures can be put forward. Finally, the U-T-S joint cultivation mode will be promoted and applied. Colleges and universities should actively publicise the successful experience of the U-T-S model and promote the implementation plan and operation process of this model to other colleges and universities. At the same time, it should strengthen the cooperation with other universities, industry alliances and primary and secondary schools to jointly explore and practice the new model of joint cultivation, to provide more support and guarantee for the reform and development of the education of physical education specialisation.

Through the implementation of the above improvement strategies, the U-T-S joint cultivation model can be further optimised to improve the cultivation quality and career competitiveness of Physical Education Specialist students so as to cultivate more high-level applied talents for the country and society.

7. Conclusion

This study demonstrates the significant effectiveness of the U-T-S (university-industry alliance-small and medium-sized school) joint cultivation model in enhancing the practical ability and career competitiveness of master's degree students in physical education. The practical research of this joint cultivation model integrates the resources of universities, industry alliances, and small and medium-sized schools. It provides a new cultivation framework for physical education master's degree education through cooperative education theory, stakeholder theory, and the graduate school cultivation model theory.

The study found that the U-T-S model effectively enhances students' practical abilities. With the support of the industry alliance, students gain rich vocational training and internship opportunities, accumulate valuable practical experience, and apply theoretical knowledge to actual teaching in primary and secondary schools, improving their teaching ability. However, some problems have been revealed, such as poor communication between colleges, industry alliances, and primary and secondary schools, as well as insufficient teaching resources in primary and secondary schools. To address these issues, the paper proposes improvement strategies, including strengthening communication and coordination between universities, industry alliances, and primary and secondary schools, improving participation motivation and guidance level of industry alliance tutors, optimising the allocation of teaching resources, and strengthening the evaluation and feedback mechanism. These strategies provide a useful reference for other universities.

In conclusion, the U-T-S joint cultivation model provides a new path for the reform and development of sport-specialised master education. Tripartite cooperation effectively solves problems in the existing cultivation mode and improves the comprehensive quality and professional ability of master's degree students in physical education. With the further implementation and promotion of these improvement strategies, the U-T-S model will be applied in more colleges and universities to cultivate high-level applied talents for the country and society.

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