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Exploring Innovative Paths for Professional Development of University Teachers in the Context of Interdisciplinary Integration

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Abstract: University education as an important cradle of talent cultivation in Chinese society, the professional ability and level of teachers also play an important role in the social supply of talent, in order to further enhance the effect and quality of talent cultivation in colleges and universities, it is necessary to vigorously promote the professional development of teachers, so as to create a high-quality teaching staff, to meet the social development of the demand for excellent talents. Interdisciplinary integration is an important path to promote teachers' professional development, which not only enables teachers to carry out educational teaching from an interdisciplinary perspective, but also enables teachers to refine their professional ability and strengthen their teaching level, so as to accomplish the task of training talents in colleges and universities in a higher quality. Therefore, in the paper, the concept and characteristics of interdisciplinary integration are analyzed in depth, its specific impact on teachers' professional competence and professional identity is analyzed, and finally an innovative path to promote the professional development of university teachers is proposed, which is used to help colleges and universities to create a high-quality professional teacher team.

Keywords: Interdisciplinary Integration; University Faculty; Professional Development.

1. Introduction

1.1. Background and Significance of the Study

1.1.1. Background

Under the background of rapid development of social science and technology and continuous updating of knowledge, interdisciplinary integrated education has become an important trend in the development of the current education field. In the education of colleges and universities, interdisciplinary integrated education can help to improve the quality of education, and at the same time, it can also promote the continuous deepening and innovation of academic research, so as to cultivate innovative talents with comprehensive qualities. However, there are many challenges in the professional development of university teachers under the interdisciplinary perspective, such as the problem of disciplinary barriers and the accelerated rate of knowledge updating, etc., and the existence of these problems to a certain extent imposes limitations on the professional development of teachers and the quality of teaching. Therefore, in-depth exploration and research on the impact of interdisciplinary integration in the professional development of university teachers and its innovative path has become an important task, but also become a key link to improve the teaching level of teachers and strengthen their professional ability. Therefore, the thesis centers on interdisciplinary integration, to explore and analyze the innovative path of professional development of university teachers, to help improve the professional level and ability of teachers, and to create a high-quality teaching force.

1.1.2. Significance of the Study

This dissertation research stands on the perspective of interdisciplinary integration to explore and analyze the professional development path of university teachers in depth, and is committed to analyzing and researching the mechanism and law of interdisciplinary integration in promoting the professional development of university teachers, so as to provide new perspectives for promoting the professional development of university teachers. Moreover, a series of innovative measures will also be proposed in this dissertation to promote university teachers to more fully adapt to the development trend of interdisciplinary integration, and continuously improve teachers' professional ability and quality, so as to make them competent for educational tasks in the context of interdisciplinary integration and to improve their teaching ability and level. The research results of this dissertation will also provide useful reference and reference for the construction of professional team of university teachers and the improvement of teaching level in universitys and universities, so as to boost the innovative reform of university education.

1.2. Purpose of the Study and Research Questions

1.2.1. Purpose of the Study

The purpose of this dissertation is to explore and analyze the impact of interdisciplinary integration on the professional development of university teachers, and at the same time, analyze the path of improving the professional competence of university teachers under the background of interdisciplinary integration, and put forward a series of innovative measures to promote the professional development of university teachers and help improve the quality of university education and the level of talent cultivation, so as to provide a steady flow of high-quality talents for the development and construction of the society.

1.2.2. Research Questions

The research questions of this dissertation are to analyze and explore what challenges and opportunities university teachers face in their professional development, and how interdisciplinarity has an impact on teachers' professional competence and sense of professional identity. At the same time, the research centers on how interdisciplinary to promote the construction of university teachers, so as to promote the innovation of teacher training and development system in colleges and universities, to meet the needs of interdisciplinary integration of teachers' professional quality ability, to help improve the overall quality of university and university teachers, and to strengthen the level of college and university education.

2. Literature Review

2.1. Theoretical Foundations of Professional Development of University Teachers

The professional development of university teachers is a relatively complex and multidimensional process, which covers multiple levels, such as the updating of teachers' knowledge system, the improvement of teaching skills, the transformation of teaching concepts, and the enhancement of professional identity and other dimensions, the theoretical basis of which covers a variety of disciplines such as pedagogy, psychology and sociology. Theories in the field of pedagogy provide teachers with the support of educational methods and strategies, which can help them understand the whole process of teaching practice and the laws of teaching more fully. Psychology focuses on teachers' development and professional growth, and can provide guidance for teachers' psychological adaptation and career planning. The social principle takes a macro view to explore the intrinsic connection between teachers' roles and social development, which can help to enhance teachers' professional identity. Zeng Yanyu(2024) mentioned the viewpoints related to the development of university teachers in his article “Foreign Language Education and Teacher Development in universitys in the Context of Interdisciplinary Development” published in 2024, which argued that under the integration of the concept of interdisciplinarity, teachers in colleges and universities need to constantly update their knowledge structure and enhance their intercultural competence, so as to adapt to the needs of education and teaching in the new era. This perspective also emphasizes the need for teachers to be up-to-date in their professional development and to have a strong link between them and the development of their subject matter, so that they can adapt to the ever-changing pace of education.

2.2. Current Status of Domestic and International Research on Interdisciplinary Integration

In the current development of the field of higher education, interdisciplinary integration education has gradually developed into an important trend, and relevant experts as well as scholars at home and abroad have conducted extensive and in-depth research around interdisciplinary integration. In foreign countries, interdisciplinary integration is regarded as an important channel to promote innovation in higher education and improve the quality of education, and many colleges and universities have begun to establish interdisciplinary research institutes, offer interdisciplinary courses to promote interdisciplinary exchanges between teachers and students, and cultivate a large number of outstanding talents with interdisciplinary qualities and innovative abilities. In China, interdisciplinary integration has also been paid enough attention by the related personnel in the field of higher education. Mu Yuxing (2023) systematically analyzed and sorted out the status quo of interdisciplinary literacy of university teachers and put forward corresponding countermeasures by combing the status quo in his dissertation “Research on the Enhancement of Teachers' Interdisciplinary Literacy” published in 2023, and pointed out that the enhancement of teachers' interdisciplinary literacy is the key to the promotion of the internal development of higher education in the dissertation study. In the study, it is pointed out that improving teachers' interdisciplinary literacy is the key to promoting the connotative development of higher education, and it also helps to build a high-quality teaching team and improve the quality and level of education. Yang Rui and Zhang Hongfeng (2024) published the article “based on the interdisciplinary perspective of university teachers to improve innovative teaching ability to explore” also explored and researched the interdisciplinary perspective of university teachers under the innovative teaching ability to improve the relevant issues, in the article put forward the viewpoint that colleges and universities need to strengthen the construction of interdisciplinary teaching team, to promote the development of interdisciplinary courses, so as to stimulate the innovative ability of teachers. Ma Xiaoyan (2022) published the article “the dilemma and breakthrough of the professional development of young teachers in western universities under the background of the construction of ‘double first-class’, in which he carried out an in-depth exploration around the professional development of teachers, analyzed the dilemmas faced by teachers in their professional development, including the updating of the knowledge system of teaching, the updating of teaching skills, the updating of practical experience and other aspects. The article analyzes the difficulties faced by teachers in their professional development, including updating the teaching knowledge system, updating teaching skills, updating practical experience, etc. Finally, it proposes to build an interdisciplinary practice teaching system, strengthen the updating of knowledge, and exercise the teaching skills, etc., which promotes teachers' professional development. Zhang Qiyao(2022) explored and researched the issues related to teachers' willingness to teach across disciplines in colleges and universities in his 2022 article, “A Study of Young Teachers' Willingness to Teach Across Disciplines in the Context of the New Liberal Arts in university Economics and Management Majors,” and found that young teachers' willingness to teach across disciplines is affected by multiple factors such as disciplinary backgrounds, teaching experiences, and school policies. This study also provides a useful reference for in-depth exploration and aircraft teachers' attitudes and behaviors in interdisciplinary integration.

2.3. Research Gaps and Innovations

Experts and scholars at home and abroad have conducted in-depth explorations and researches on interdisciplinary integration and the professional development of university teachers, but there are some gaps and problems that need to be solved. First of all, in terms of the impact of interdisciplinary integration on teachers' professional

competence, the existing research focuses on the improvement of teachers' knowledge structure and teaching competence, but seldom touches on the cultivation of teachers' scientific research ability and innovation ability. Secondly, there is a lack of in-depth research on the impact of interdisciplinary integration on teachers' professional identity. There are also some shortcomings and gaps in how to effectively build interdisciplinary teaching teams and cooperation mechanisms, and how to innovate the teacher training system and development system that need to be addressed.

In response to the gaps and problems mentioned in the above analysis, this study will focus on how to promote teachers' professional development around interdisciplinary integration, as well as analyzing the impact of interdisciplinary integration on the cultivation of teachers' professional competence and creativity, the impact on teachers' sense of professional identity, and how to effectively build up interdisciplinary teachers' teams. In the study, a series of innovative paths to promote the professional development of teachers are also proposed based on the needs of talent cultivation in colleges and universities, such as the establishment of interdisciplinary teams and cooperation mechanisms, innovative teacher training and development system, the construction of a diversified evaluation system and incentive mechanism, and the strengthening of policy support and incentive mechanism, etc., which can be used to help improve the quality of talent cultivation in colleges and universities.

3. The Impact of Interdisciplinary Integration on the Professional Development of Higher Education Teachers

3.1. Concept and Characteristics of Interdisciplinary Integration

3.1.1. The Concept of Interdisciplinary Integration

Interdisciplinary integration, also known as multidisciplinary integration, is a new trend in the field of education, which emphasizes the focus on the organic integration of knowledge, methods, theories and ways of thinking of two or more disciplines, so as to solve the complexity of problems that are difficult to deal with in a single discipline, and to improve the efficiency of problem solving (Liu Xiaoxiao, Chang Xuhua, Chen Qiang. 2019). The most central element of interdisciplinary integration is to break down the barriers between disciplines, realize the in-depth integration of interdisciplinary resources, and on this basis promote cross-fertilization and interaction between disciplines, so as to make the knowledge system richer and broaden the research horizons while helping to cultivate students' innovative thinking.

3.1.2. Characteristics of Interdisciplinary Integration

Interdisciplinary integration is extremely distinctive and is reflected in the following aspects:

First, synthesis. Comprehensive is a major feature of interdisciplinary integration, in the stage of interdisciplinary integration of different disciplinary knowledge and resources need to be deeply integrated, so as to form a comprehensive solution to the problem, highlighting the composite nature of the problem-solving perspective and the integration of resources in the process of the problem.

Second, innovation. Interdisciplinary integration shows extremely significant innovative characteristics, that is to say, interdisciplinary integration requires the intersection and collision of disciplines, and this intersection and collision of disciplines can easily produce new theories, new methods and ways of solving problems, thus forming an innovative way of thinking.

Third, practicality. Practicality is another characteristic of interdisciplinary integration, which is mainly manifested in the fact that interdisciplinary integration emphasizes the comprehensive application of knowledge from various disciplines and the solution of practical problems on the basis of comprehensive application, a process that not only highlights the integration of knowledge from various disciplines but also realizes the close integration between theory and practice.

3.2. Impact of Interdisciplinary Integration on Teachers' Professional Competence

3.2.1. Interdisciplinary Integration Promotes the Broadening of Teachers' Knowledge and the Deepening of Their Professionalism

Interdisciplinary integration of teaching stage, teachers need to master a wealth of professional knowledge, and also need to integrate the methods and ways of thinking of a number of disciplines, and this process of education and teaching constantly requires teachers to have a solid foundation of professional knowledge, but also requires teachers to extensively explore the relevant professional knowledge of various disciplines, and the integration of various disciplines of problem-solving methodology and thinking. Therefore, teachers in the interdisciplinary integration of teaching stage can also continue to expand their own knowledge, in the teaching practice more comprehensively to promote the depth of the connection between various disciplines, co-ordination of the differences between the disciplines, which not only helps to enhance the teacher's professional ability, but also helps to promote the teachers of the connotative development.

3.2.2. Interdisciplinary Integration Helps to Improve Teachers' Instructional Design and Innovation Ability

In the phase of interdisciplinary education and teaching, teachers need to change the traditional thinking of teaching design, break the traditional single discipline teaching mode, so as to innovate the teaching design, based on the integration of knowledge and methods of different disciplines, and comprehensive teaching around the enhancement of students' professional competence. And this innovative perspective of teaching ideas can not only enhance students' learning interest and subjective initiative, but also help to cultivate students' comprehensive ability and innovative thinking. This process not only puts forward new requirements for teachers' teaching design ability, but also requires teachers to combine the needs of students' professional development with the innovative design of teaching content, which also helps to improve teachers' innovation ability.

3.2.3. Interdisciplinary Integration Enhances Teachers' Collaboration and Communication Skills

At the stage of interdisciplinary integrated education, teachers of various disciplines often need to carry out in-depth exchanges as well as close cooperation, through the depth of cooperation of various disciplines in order to ensure that the

interdisciplinary teaching design is more scientific, and to improve the quality and effectiveness of interdisciplinary teaching. And in the exchange and cooperation between teachers of various disciplines will help teachers of various disciplines to learn from each other, learn from each other and improve together, which in turn will help teachers to continuously improve their cooperation and communication skills and promote their professional development.

3.3. Impact of Interdisciplinary Integration on Teachers' Professional Identity

3.3.1. Enhancing Teachers' Sense of Professional Fulfillment

Interdisciplinary integration of teaching in universitys and universities can effectively break the traditional teaching model, such as the traditional teaching model teachers tend to focus on teaching a single subject teaching, but through interdisciplinary integration is no longer limited to a single subject, which allows teachers to explore a wider range of disciplinary knowledge content, and for students to carry out a comprehensive educational practice. This kind of teaching practice not only enriches teachers' teaching experience and expands their professional knowledge, but also gives them the opportunity to see the positive role they play in the overall development of their students, thus helping to enhance their sense of professional fulfillment, which in turn will further stimulate the enthusiasm of university teachers to work and enhance their own sense of professional identity.

3.3.2. Broadening Teachers' Professional Horizons

At the stage of interdisciplinary integration teaching in colleges and universities, new requirements are put forward for teachers' professional knowledge and ability, which require teachers to have rich professional knowledge and good professional ability, so this also urges teachers in colleges and universities to carry out continuous learning and in-depth exploration of professional knowledge in other subject areas. Therefore, in this process university teachers will also come into contact with richer parenting concepts, teaching methods, and pay attention to the academic achievements of the field, so interdisciplinary integration of teaching also helps to broaden the professional horizons of teachers, and has a positive significance and impact on the promotion of teachers' professional development.

4. Innovative Paths to Professional Development for Higher Education Teachers

4.1. Establishment of Interdisciplinary Teams and Cooperation Mechanisms

In the rapid development of China's education, interdisciplinary teaching has gradually become a new trend in the field of higher education, the development of interdisciplinary teaching not only helps to improve the level and effect of teaching, but also effectively breaks the boundaries between the traditional disciplines, for the cultivation of students' innovative thinking and innovative ability has positive significance. In order to promote the professional development of teachers in this process, it is necessary to vigorously build interdisciplinary teams and establish a perfect cooperation mechanism. For example, in the construction of interdisciplinary teams, teachers with different professional backgrounds should form a research team, so that teachers can cooperate with each other to carry out interdisciplinary teaching research and improve the quality of interdisciplinary teaching. At the same time, the mutual cooperation mechanism between teachers can also benefit each teacher, realize the collision and integration of knowledge and professional ability, and thus improve the professional quality and teaching level of teachers. For example, in the field of environmental sciences, interdisciplinary teams of teachers from geography, biology, and chemistry can be formed to develop interdisciplinary education in environmental protection and sustainable development through the joint efforts of all teachers, which will not only improve the quality of education, but also promote the professional development of teachers.

4.2. Innovative Teacher Training and Development System

Under the perspective of interdisciplinary integration, the promotion of teachers' professional development also requires a vigorous innovation of the teacher training and development system, so as to improve teachers' ability and comprehensive quality. In practice, the first task is to establish a sound teacher training system, such as the regular organization of teacher training in professional knowledge, training in innovative teaching methods, etc., to meet the professional growth needs of teachers of various disciplines through diversified training. At the same time, we can also consider the introduction of school-enterprise cooperation mode in colleges and universities, in which the training mode of enterprises can be introduced, so that teachers can learn how to fully integrate theory and practice through training, which not only improves the professional level of teachers, but also strengthens the professionalism and timeliness of training. Finally, in the phase of professional training for teachers, online and offline methods should be comprehensively utilized to provide teachers with more flexible learning opportunities through the integration of online and offline pathways, so that teachers can be exposed to a wealth of interdisciplinary teaching experience and practice cases through online and offline, thus promoting the professional development of teachers.

4.3. Constructing a Diversified Evaluation System and Incentive Mechanism

Vigorously constructing a pluralistic evaluation system and incentive mechanism is the top priority and the key to reflecting the effectiveness of teachers' professional development, especially in the perspective of interdisciplinary integration, constructing a pluralistic evaluation system and incentive mechanism has also become the top priority to guarantee teachers' professional development. In the stage of constructing a diversified evaluation system, it is necessary to pay attention to the diversification of evaluation dimensions and the three-dimensionalization of evaluation methods. In terms of evaluation dimensions, it is possible to integrate the teachers' academic achievements, teaching performance, social services, scientific research achievements and other aspects, and in terms of evaluation methods, it is possible to adopt a variety of evaluation methods such as students' evaluation, teachers' self-assessment, peer mutual evaluation, etc., which can not only reflect teachers' professional growth in multi-dimensions, but also This can not only reflect the professional growth of teachers in multiple dimensions, but also ensure the

objectivity and reliability of the evaluation results. In the construction of incentive mechanism, we can consider linking the evaluation results with teachers' salary and compensation, title evaluation, promotion opportunities, etc., which not only helps to stimulate teachers' enthusiasm for interdisciplinary learning, but also enables teachers to have stronger subjective initiative on the path of professional growth, which in turn helps to improve the overall quality of the overall university teaching force and professional competence.

4.4. Policy Support and Institutional Safeguards

To promote teachers' professional development based on interdisciplinary integration perspective, it is also necessary to strengthen the policy support and institutional guarantee, so colleges and universities need to play a leading role in this process, such as the establishment of a sound mechanism for teachers' professional development and management system, to fully coordinate the teachers' title evaluation, salary distribution, performance evaluation and other aspects, to link these contents with teachers' professional development, and to form a perfect reward and guarantee system, so as to provide policy support for teachers' professional development. The system provides policy support for the professional development of teachers in colleges and universities by establishing a sound mechanism and management system for teachers' professional development. In addition, colleges and universities should also strengthen exchanges and cooperation with social enterprises, research institutions and other aspects of the exchange and cooperation between the two sides can provide teachers with learning channels, learning resources, so that teachers can form an in-depth understanding of the concept of interdisciplinary integration in the continuous learning, and the concept of interdisciplinary integration into the teaching practice, to help strengthen the level of professional development of university teachers, to create a high-quality, specialized Teachers.

5. Conclusion and Outlook

5.1. Conclusion of the Study

This dissertation study explores and analyzes the innovative path of interdisciplinary integration in the professional development of university teachers and concludes that interdisciplinary integration is not only an important trend in the development of university education, but also a key link in promoting teachers' professionalism and stimulating teachers' innovative vitality. In university education, through interdisciplinary collaboration and communication, teachers can break the traditional disciplinary boundaries, and then realize the mutual integration of knowledge and methods in teaching and learning, which not only improves the level and effect of teaching, but also promotes the professional growth of teachers. Moreover, interdisciplinary integration is also the key to the innovation of teachers' professional development system, through interdisciplinary integration can help teachers master rich knowledge, update their own professional skills, help to improve the teaching level of teachers, and then for the cultivation of talents in colleges and universities to inject a constant stream of vitality. In conclusion, interdisciplinary integration has far-reaching significance and impact on promoting the development of university teachers, and has also become an important conceptual leadership for the construction of university teachers.

5.2. Research Limitations and Future Prospects

Although this thesis has achieved certain results, there are also certain limitations and shortcomings in it. For example, due to the limitation of research time and resources, the study did not conduct an in-depth research and analysis of interdisciplinary integration practices in all universities. In addition, the study focuses on theoretical discussions and policy recommendations, and pays relatively little attention to the details of implementation and practical effects. In the future research, the author will also be committed to exploring more deeply how to expand the scope of the research sample, so as to analyze the impact of interdisciplinary integration on teachers' professional development in different types and levels of colleges and universities, with a view to achieving more fruitful research results.

5.3. Policy Recommendations and Practical Implications

Based on the conclusions and limitations of this study, the following policy recommendations are proposed. First, local governments and educational administrations need to issue corresponding documents to encourage and support colleges and universities to promote the practice of interdisciplinary integration, so as to provide an excellent objective environment and resources for teachers' professional development. Second, colleges and universities should improve their teacher training and professional development system, and commit to strengthening the interdisciplinary literacy of teachers, so as to improve their teaching level and scientific research ability. The practical significance of this dissertation is to help cultivate excellent educational and teaching talents with innovative spirit and compound ability, so that teachers can promote educational innovation in colleges and universities based on interdisciplinary perspective, and help universitys and universities to build a professional and high-quality interdisciplinary integration of teachers, and to provide a steady stream of diversified and compound talents for the development and construction of various fields of our society.

References

[1] Yanyu Zeng. Foreign Language Education and Teacher Development in universitys and Universities in the Context of Interdisciplinary Development[J]. Foreign Language and Foreign Language Teaching,2024(3):11-19,145.

[2] Mu Yuxing. Research on Interdisciplinary Literacy Enhancement of Higher Education Teachers [D]. Lanzhou University, 2023.

[3] Yang Rui, Zhang Hongfeng. Exploring the enhancement of innovative teaching ability of university teachers based on interdisciplinary perspective[J]. University Education, 2024 (6): 4-7.

[4] Ma Xiaoyan. Dilemma and breakthrough of young teachers' professional development in western universities under the background of “double first-class” construction[J]. Journal of Ningxia University (Humanities and Social Sciences Edition),2022(3):187-193.

[5] Zhang Qiyao. Research on Interdisciplinary Teaching Willingness of Young Teachers of Economics and Management Specialties in universitys and Universities under

the Background of New Liberal Arts[J]. Journal of Chengdu Normal university,2022(9):15-23.

[6] LIU Xiaoxiao, CHANG Xuhua, CHEN Qiang. The impact of innovative cooperation model on teachers' research performance-the moderating effect of the degree of interdisciplinarity [J]. China Science and Technology Forum, 2019 (7): 69-75,83.