Research on the Sustainable Development Path System of College Teachers' Professional Learning Community in the Era of Digital Intelligence

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Abstract: In the era of digital intelligence, the sustainable development of professional learning community (PLC) for college teachers is critical to the modernization of education and the professional development of teachers. This paper focuses on building professional learning community that adapts to technological change and supports teachers' lifelong learning. Firstly, the paper explores the changes of teachers' roles in the digital age, the diversity and characteristics of professional learning community, and the challenges in technology integration and professional development. Based on this, the sustainable development path system that includes technological support, teachers' professional growth and the shaping of the community's culture, as well as corresponding strategies and suggestions are proposed to facilitate the efficient operation and long-term development of professional learning community for college teachers and better promote their professional growth and development.

Keywords: the era of digital intelligence; college teachers; professional learning community; sustainable development

1. Introduction

1.1 Background of the study

With the rapid development of information technology, we have stepped into the era of digital intelligence characterized by the extensive application of big data, cloud computing, artificial intelligence and other technologies. The technological innovations of this era have not only reshaped the social structure, but also profoundly affected the field of education, especially bringing unprecedented challenges and opportunities to the teaching practice and professional development of college teachers. In this context, teachers need to adapt to the emerging teaching environment and master advanced educational technologies to enhance teaching quality and students' learning experience.

Professional Learning Community (PLC) has received widespread attention as an effective model for promoting teachers' professional growth and enhancing education quality. The core of professional learning community lies in the promotion of collaboration, resource sharing and reflective practice among teachers, which is considered to be the key to improving the quality of education. The role of professional learning community is particularly prominent in the context of the digital age, which not only helps teachers adapt to technological changes but also promotes the continuous development of their professional skills. However, as sustainable development becomes the core goal of education in the 21st century, ensuring the long-term sustainability of professional learning community has also become a new challenge for educational research. For professional learning community of university teachers, this means that in the pursuit of improving the quality of education, the far-reaching impact of their activities on the environment, the economy and society also needs to be considered.

1.2 Significance of the study

From the perspective of technological change in the era of digital intelligence, this paper aims to explore how to build and maintain an efficient and sustainable professional learning community for college teachers. This research not only enriches the theoretical framework of professional learning community, but also provides practical strategies for educational policy making and teachers' professional competence enhancement, which will help promote the modernization process of education and support the sustainable development of society and economy.

2. Literature Review

In the context of the digital age, the study of professional learning community has become a hot topic in the field of education. Scholars generally agree that professional learning community play an important role in promoting teachers' professional development and educational innovation. As professional learning community have evolved from traditional face-to-face communication to online collaboration, interaction and knowledge sharing among community members have become increasingly important, and the construction and management of learning community need to be supported by emerging technologies.

Existing literature focuses mainly on the construction of the structure, function and theoretical framework of professional learning community. Scholars have explored in depth the core features of professional learning community and analyzed their implementation strategies in diverse educational contexts, with supportive environments, shared visions, and sustained reflective practices receiving extensive attention. In terms of assessing the impact of professional learning community on teachers' professional growth, empirical studies have shown that professional learning community play a positive role in facilitating teachers' knowledge sharing, skill enhancement, and improvement of teaching practices. In addition, existing research has explored how to build and maintain effective professional learning community from a policy and management perspective. Such studies have proposed a series of policy recommendations and management models to support the establishment and operation of professional learning community.

In summary, existing research provides valuable perspectives for understanding professional learning community, but how to integrate

emerging technologies and educational practices in the context of the digital age in order to promote the sustainable development of professional learning community for university teachers is still an important topic that needs to be further explored.

3. Characteristics and Challenges of Professional Learning Community for College Teachers in the Era of Digital Intelligence

3.1 The reshaping of teachers' roles in the age of digital intelligence

With the advent of the digital age, the role of teachers has undergone a remarkable transformation. They are no longer just transmitters of knowledge, but have become facilitators of learning, integrators of technology, and guides to innovation. These new roles require teachers to not only master the content, but also to familiarize themselves with the latest developments in educational technologies and how to effectively integrate these technologies into their teaching practices. To adapt to these changes, teachers need to continually update their technological knowledge and pedagogy, which relies heavily on the support and resources of professional learning community.

3.2 The diversity and characteristics of professional learning community

Teachers' professional learning community display a rich diversity of organizational forms and operational mechanisms. These community communicate through online forums, social media groups, face-to-face seminars, etc. Discipline-specific professional learning community may focus more on deepening the pedagogy and content of a particular discipline, while interdisciplinary professional learning community emphasize the integration of knowledge and skills across different disciplines. In terms of operational mechanisms, some community focus on regular group seminars, while others emphasize immediate interaction among individuals. Teacher engagement and interaction patterns play a decisive role in the effectiveness of the community, and high-quality interactions are often based on a culture of trust and respect among members. However, teacher participation is affected by a variety of factors, such as individual motivation, organizational support and scheduling, which pose challenges to the stable functioning of the community.

3.3 Challenges and strategies

In the context of the digital age, the professional learning community of college teachers faces multiple challenges. The challenge of technology integration and application is particularly significant, which requires teachers to continuously update their technological knowledge and skills to adapt to the rapidly changing educational technology environment. At the same time, barriers to teachers' professional development need to be addressed, such as time constraints, lack of resources, and uneven professional development opportunities. In addition, how to integrate the concepts and practices of sustainable development into teachers' daily work and promote communication and collaboration among members to maintain the vitality and innovativeness of the community are key challenges in realizing sustainable development in education.

In order to effectively address these challenges, professional learning community for university teachers need to explore more flexible and inclusive organizational forms and more efficient operational mechanisms to promote wider teacher participation and resource sharing. At the same time, the professional learning community also needs to cultivate a supportive and collaborative culture that encourages teachers to share their experiences and learn from each other, so as to meet the requirements for teachers' professional development in the age of digital intelligence. This requires not only efforts within the community, but also support from the external environment, including cooperation and support from various parties such as policy makers, educational institutions, and technology providers.

4. Theoretical Construction of the Sustainable Development Path System of College Teachers' Professional Learning Community

4.1 Practical application of construction principles and concepts

In the context of the digital age, the construction of a sustainable pathway system of professional learning community for university teachers needs to be guided by the core principles of educational equity and inclusiveness, lifelong learning and continuous improvement. To this end, the construction and operation of the professional learning community should ensure that all teachers can participate in the activities of the professional learning community, regardless of their background, experience or technical level, by providing equal access to technical training and resources. At the same time, the professional learning community should encourage teachers to participate in ongoing professional development activities, such as regular workshops, online courses and peer reviews, in order to facilitate the updating of knowledge and skills so as to better adapt to the rapid changes in educational technology. In addition, the professional learning community should support teachers' individual professional development needs and harmonize them with the overall goals of the community in order to achieve individual and collective growth.

4.2 Elements and key dimensions

The components of the sustainable development pathway system include technical support and resource optimization, teachers' professional growth and capacity enhancement, and the shaping of community culture and values. These elements interact with each other to promote the sustainable development of the professional learning community. Therefore, professional learning community need to provide the necessary technical tools and educational resources to help teachers effectively integrate technology into their teaching practice, while teachers' professional growth and capacity enhancement depend on these technical supports, and through participating in the activities of professional learning community, teachers are able to enhance their teaching methods and subject knowledge. At the same time, the sustainability of these activities requires the shaping of culture and values as spiritual support, and the building of a culture of cooperation, respect and sharing helps to motivate teachers to actively participate and contribute their knowledge and experience.

4.3 Pathway system and implementation strategies

The construction of the pathway system should be based on the aforementioned principles and elements, forming a dynamic circular feedback mechanism so as to promote the mutual reinforcement of teachers' individual development and the overall progress of the community. Implementation strategies mainly include organizing regular technical training to help teachers master the latest educational technology, establishing an online collaboration platform to facilitate communication and resource sharing among teachers, and setting up a professional development fund to support teachers' participation in seminars and research projects. In addition, to ensure the effectiveness and sustainability of the pathway system, it is crucial to assess the effectiveness of the community's activities on a regular basis. This can be done through a combination of quantitative and qualitative methods such as questionnaires, interviews and case studies. The implementation of the above strategies will help the Professional Learning Community to sustainably adapt to the challenges of the digital age and support teachers' professional growth, thereby enhancing the quality of education.

5. Conclusion and Recommendations

5.1 Conclusion of the study

This study provides an in-depth analysis of the sustainable development of professional learning community for university teachers in the era of digital intelligence. The findings suggest that educational equity and inclusiveness, lifelong learning and continuous improvement are key principles for building effective professional learning community. The comprehensive framework proposed in this study integrates the elements of technical support, resource optimization, teachers' professional growth and competence enhancement, and community culture and value shaping, which provides a theoretical foundation and practical guide for the sustainable development of professional learning community.

5.2 Related recommendations

In the era of digital intelligence, the sustainable development of professional learning community for college teachers requires the participation and assistance of many parties. On the one hand, communication and cooperation within the professional learning community should be strengthened, an efficient technical support system should be established, and a positive community culture should be fostered in order to improve teacher participation and interaction quality. On the other hand, the sustainable development of professional learning community needs the support of the external environment. Policy makers should introduce supportive policies to provide teachers' professional learning community with necessary resources and technical support in order to promote teachers' professional growth and improve the quality of education. At the same time, colleges and universities and educational institutions should regularly assess the effectiveness of professional learning community activities and adjust policies and practices according to the assessment results to ensure the long-term sustainable development of professional learning community.

References:

[1] Castaneda, D. I. (2020). Knowledge sharing and innovation: a systematic review. Knowledge and Process Management, 27(3), 159-173.

[2] Clark, A. M., Zhan, M., Dellinger, J. T., & Semingson, P. L. (2023). Innovating Teaching Practice Through professional learning community: Determining Knowledge Sharing and Program Value. Journal of Professional Nursing, 39(1), 1-9.

[3] Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. American Educational Research Journal, 38(4), 915-945.

[4]Hudson, C. (2023). A Conceptual Framework for Understanding Effective Professional Learning Community (Professional Learning Community) Operation in Schools. Journal of Education, 1-14.

[5] Huijboom, F., Van Meeuwen, P., Rusman, E., & Vermeulen, M. (2020). Keeping track of the development of professional learning community in schools: the construction of two qualitative classification instruments. Professional Development in Education, 47(4), 667-683.

[6] Lee, M., & Kim, J. W. (2022). A review of professional learning community (PLC) instruments. Journal of Educational Administration, 60(4), 262-287.

[7] Li, Su-Min, Lan Shan. (2023). The experience and inspiration of the localization of teacher professional learning community in Singapore. Journal of Beijing Institute of Education (01), 86-92.

[8] Zheng X., Liu Y. Yin H. Biao. (2022). How do culture and context influence teacher learning? --An example from a study of teacher learning community in China. Journal of East China Normal University (Education Science) (10), 29-41.

[9] Lee, Xiaohui, and Changyan Park. (2020). Practices and Implications of Korean Teachers' professional learning community - A Case Study Based on Gyeonggi Province. Journal of Teacher Education (04), 94-103.

[10] Yu M, Li L-H. (2023). Feasibility study on the construction of blended professional learning community for college teachers in network era. Journal of Higher Education (36), 152-156.

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