

THE CONSTRUCTION AND APPLICATION OF A TEACHERS' PROFESSIONAL DEVELOPMENT PLATFORM UNDER THE CONCEPT OF SELF-DIRECTED LEARNING

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ABSTRACT

Teachers' professional development is an important factor to improve the quality of teaching in colleges and universities. At present, teachers' professional development in colleges and universities mainly focuses on teacher training and consultation, lacking personalized attention to teachers' professional development. With the development of technology, the construction of a professional development platform for teachers based on the concept of self-directed learning provides a new perspective on teachers' professional development. This paper first analyzes the design ideas of A University's teacher professional development platform, and systematically describes how to integrate teachers' learning resources, build teaching portfolios and build online communication communities under the guidance of the self-oriented concept from the perspective of different sessions of data aggregation, self-development and teaching promotion. Then, after analyzing the application of the platform, the results show that the construction of a professional development platform based on the concept of self-directed learning plays an important role in supporting teachers' personalized development paths, promoting teachers' reflection on teaching, and building learning communities.

KEYWORDS

Self-Directed Learning, Teacher Professional Development, Portfolios, Portraits, Community

1. TEACHERS' PROFESSIONAL DEVELOPMENT AND SELF-DIRECTED LEARNING

The connotation of teachers' professional development was put forward one after another in the 1970s, and Jerry Gaff's definition of professional development for university teachers was widely recognized. He believed that teachers' professional development refers to teachers' improvement of teaching design, teaching evaluation, teaching activities, and continuous improvement of teaching effectiveness, etc(Gaff, 1975). Chinese scholars have interpreted teachers' professional development with Chinese characteristics. They believe that teachers' professional development is a process in which teachers improve their professional awareness, knowledge and spirit through continuous professional learning, reflection on teaching practice, curriculum development and inquiry into the ways of teaching, so as to ultimately achieve excellent teaching that promote students' effective learning and their own life values. It is a process of professional growth in which the social environment, cultural and personal characteristics influence each other continuously (Su, 2015). The two major ways for teachers' professional development are school promotion and self-development. The former includes improving professional development system, setting up teacher's professional development institutions, implementing professional development programs, and improving teaching training (Yao, 2018).

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In the field of teacher professional development, self-directed learning theory has attracted increasing attention, and there is a general awareness that teacher professional development cannot only rely on conventional training programs and one-way indoctrination, but requires teachers' initiative, purpose, planning and systematic practice, as a result, teachers acquire knowledge, develop competencies and form values in practice. Self-directed learning was developed from adult education theory. Knowles, a leading adult educator, defines self-directed learning as "a personal spontaneously process with or without help of others, in which learners determine learning needs, form learning goals, identify human and physical learning resources, select and implement appropriate learning strategies, and finally assessment learning outcomes.". Self-directed learning transcends the limitations of traditional self-learning in terms of concept, meaning, approach, and process by integrating the external characteristics of being a teaching and learning process with the internal characteristics of being a learner who actively assuming responsibility for learning, combining independent learning with external support (Li, 2005). Self-directed learning emphasizes learners' development, implementation, evaluation and responsibility for learning programs, and it is important for promoting teachers' professional development.

At the same time, with the development of information technology, technology has become massively employed in teaching and learning in schools. There are more channels of access to teaching resources and more timely and convenient communication, which facilitates teachers' self-directed development. In the new era, how to promote teachers' self-needed, active and conscious development behaviors based on the concept of self-directed learning through information technology has important practical and theoretical values for promoting teachers' professional development and improving the quality of the teaching force. Therefore, this study discusses how faculty professional development platforms can support teachers' self-directed professional development through the construction and practice of a professional development support platform for teachers at A University.

2. DESIGN OF A SUPPORT PLATFORM FOR FACULTY PROFESSIONAL DEVELOPMENT AT A UNIVERSITY

Many colleges and universities at home and abroad have set up teachers' professional development centers, which are especially responsible for teachers' professional development in their own universities and play an important role in strengthening teachers' awareness of professional development, enriching teaching knowledge and improving teaching ability, etc. However, the professional development of teachers in most colleges and universities still focuses on teaching training and consultation, lacking personalized attention to teachers' growth (Yan, 2019). At the same time, relating to the design and construction of the teacher professional development platform, the core idea is also to provide training courses for teachers, and promote teachers' professional development by providing them with online training courses. In addition, some universities build faculty information management systems to save, record, organize and analyze faculty information, and manage it scientifically (Tan, 2022), these kinds of platforms are often combined with teacher evaluations. However, these platforms, which singularly provide training courses for teachers or manage their teaching information, lack individualized attention to teacher growth and do not give full play to the potential of teachers' self-development.

Guided by the theory of self-directed learning, there are three key elements in the design of the professional development support platform for teachers at A University: First, it is teacher-oriented and respects the autonomy of teacher development. Unlike the fixed training program paradigm, the A University Teacher Professional Development Support Platform not only provides teachers with diverse teacher training programs, but also learning resources and materials for teachers' professional development, opportunities for peer exchange and collaboration, and exploration of teaching laws. In addition to this, teachers have the right to choose their own matching resources and freely select their development path. Second, it emphasizes teachers' awareness and ability to self-reflect. Reflection is an inevitable requirement and a fundamental prerequisite for teachers' professional development. Teachers' self-directed learning is often directed at specific problems encountered in teaching practice, but the contextual nature, complexity, uncertainty, instability, and conflicting values of teaching practice make it impossible for teachers to solve practical problems directly by relying on or applying ready-made theory or book knowledge. They need to learn to critique pedagogical ideas, concepts and methods, to criticize and reflect on their own and others' theories, beliefs, words and practices, to remove

prejudices, limitations and barriers, and to explore and grasp the essence and methods of teaching and learning in order to effectively solve problems and make progress in learning (Li & Qin, 2006). The teacher's teaching portfolio is an important tool for teachers to reflect on their teaching. Therefore, in the design of A University platform, teachers' teaching reflection is promoted through the construction of teaching portfolios. Third, focus on collaborative peer development. Self-directed learning does not mean learning by oneself alone; it is one of the important ways of teachers' professional development and does not exclude collaborative learning and action research. Self-directed learning emphasizes the learner's flexibility, initiative and motivation to determine learning goals, content and methods according to his or her actual needs and time and conditions, but it also requires help, tutoring and support of others and the effective use of necessary human and material learning resources(Wang, 2009). The construction of an online community and the sharing and discussion of teaching portfolios have both facilitated and provided space for the collaborative development of faculty peers.

In summary, the A University teaching professional development support platform emphasizes teachers' independent choice, active reflection, personality development, and peer cooperation. The design framework is shown in Figure 1.

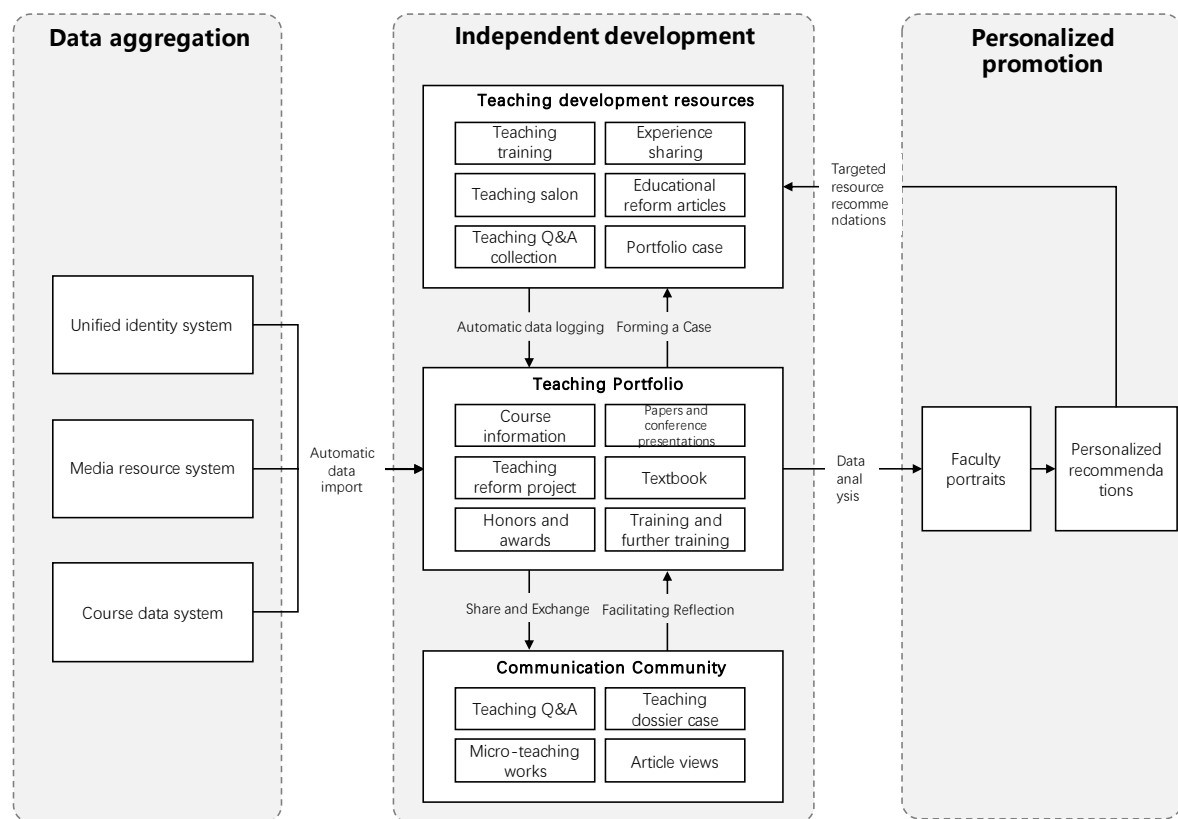


Figure 1. A teacher professional development platform design framework based on the theory of self-directed learning

1. Data aggregation

The data aggregation session involves multiple systems, mainly including:

1) the unified identity authentication system of A University, which is a management system for the basic personnel information and system authority of the whole school, including the teacher's job number, position, contact information, authority, etc., used for the information construction and management of the school.

2) The media resource system, in which there are instructional video recordings of all teachers in the school, as well as some featured courses, open courses and other video resources of some teachers. It is an important material reflecting teachers' teaching, and also the basic content of teachers' teaching portfolio.

3) Course data system, which contains the information of the whole faculty, including the time, location, target audience, and number of lectures offered. Through the data connection to these platforms, A University Professional Development Support Platform allows teachers to log in to the platform using unified identity authentication without registration, and for the automatic import of course information and media resource

information, it lays the data foundation for teachers' teaching portfolio construction and professional development activities.

2. Independent development

The independent development session is the core of the professional development support platform of A University, which mainly has three modules.

1) Professional development resources. In this module, the platform provides various teaching training projects for teachers' professional development, such as digital teaching & learning. At the same time, there are collections of teaching questions and answers, teaching experience sharing, teaching reform articles, and portfolio cases, etc. Of particular importance is that teachers' learning data from these resources on the platform are automatically recorded and become important data in the teaching portfolios.

2) Teaching Portfolio. Teaching portfolios can guide teachers to visually see their personal growth and progress and effectively promote their personal reflection (Yu & Feng, 2020). In the construction of the platform, the contents of the teaching portfolio include course information, papers and conference reports, teaching reform projects, teaching materials, honors and awards, training and further training, etc. Teaching portfolios play a vital role in teachers' professional development. They not only help teachers integrate teaching resources and record professional development data, but also serve as a basis for teachers' teaching reflection and peer exchange. Teachers can edit and share their teaching portfolios in the platform.

3) Communication Community. The teaching communication community provides online communication and sharing opportunities for teachers' professional development. According to teachers' learning needs, the columns in the platform community are divided into: teaching Q&A, teaching dossier cases, micro-teaching works, article views, etc. And the columns are adjusted and supplemented in real time according to the focus of teachers' attention.

3. Personalized recommendations

The personalized facilitation session is a support platform providing personalized services for teachers' personalized development. In this session, artificial intelligence algorithms such as machine learning need to be used to analyze teachers' professional development paths, which is one of the important application scenarios of educational artificial intelligence (Yang & Ren, 2021). By supporting teachers, the teacher professional development platform can collect and analyze various aspects of teacher development data, such as basic user data, topic preference data, learning path data, activity level data, interaction data, etc., thus building a multi-dimensional labeling system of teacher professional development portrait. This enables precise and effective support and services for teachers' professional development, such as recommending resources and activities that are of interest to teachers.

3. THE PRACTICE AND APPLICATION OF PROFESSIONAL DEVELOPMENT SUPPORT PLATFORM FOR TEACHERS AT A UNIVERSITY

The professional development platform of A University has features such as "aggregating teaching data, promoting teaching reflection, and forming a communication community" to support teachers' entire professional development process. In this way, we support teachers' self-directed learning by providing instructional development courses and resources, building teaching portfolios, and creating opportunities for peer collaboration, and provide personalized support for teachers' instructional development by painting a portrait of their professional development through big data analysis. Since the platform began to be built in 2022, in two years, the platform has made useful practices and achieved initial results in integrating faculty professional development programs, building teaching portfolios, and building online communities.

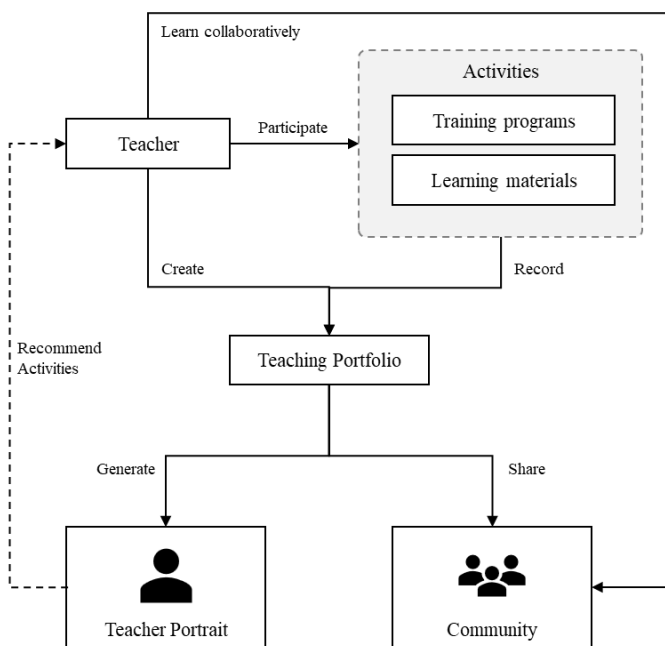


Figure 2. A personalized flow supporting teacher's professional development

3.1 Integrate Professional Development Programs to Support Individualized Development Paths

A University's teacher professional development platform integrates the university's programs and related resources for teacher professional development, where teachers can choose what they need and plan their own path to self-development.

First, it organizes teacher training with various themes. In response to the different development stages of BYU faculty and different development needs, different types and themes of training programs are provided on the platform, such as capacity enhancement training for new faculty members; internationalization training; academic writing training, etc. Training topics cover: innovation and evidence-based teaching, assessment of student learning outcomes and teaching, active learning and innovative teaching, Inclusive teaching and learning online, the future higher education and AI, what do we need from assessment in the post covid-19 era, etc. These trainings are offered on the platform each year for teachers across the school to attend freely. Front-line teachers can go to the platform and select the topics they need according to their teaching needs and learning goals. This is similar to an open learning platform where students can choose the courses they need to improve their learning ability and proficiency.

In addition to a wide variety of topics, the platform also provides teachers with multiple learning formats, for example, teachers can choose to attend training offline for learning, or participate online or watch playback videos, while the platform will also have documents provided by the lead teacher for downloading and learning. Teachers can choose the appropriate way to learn according to their time and preferences.

Through teachers' behavioral performance on the platform, this study found that: first, the number of young teachers who participated in the professional development program was absolutely dominant, which may be due to: 1) Young teachers are less experienced in teaching and are more likely to encounter problems in teaching, while the vast majority of young teachers do not have systematic training in teaching before they embark on their teaching positions, therefore, they have real needs for professional development. (2) Many universities have certain requirements for young teachers to participate in teaching training, for example, the "New Teacher Study Camp" of Southeast University and the "Honghu Academy" of Beijing Institute of Technology have requirements for the length or number of young teachers' participation. Second, teachers prefer the offline face-to-face learning format to self-learning through playback videos, and the platform can play a greater role in providing supplementary text and video materials.

Table 1. A summary of training topics on the platform

Training Topics	Object Oriented	Rounds	Number of people	Form
Improvement of teaching ability for new teachers	New teachers in our school	6	12,000	Offline + video replay
Midwest young faculty teaching skills enhancement	Midwest young teachers	1	2,000	Online live streaming + video replay
Cultivation of ideological and political model course	All teachers in our school	2	500	Online live streaming + video replay
PKU-MU professional development seminar	College teachers nationwide	2	1,000	Offline + video replay
Academic paper writing guide	College teachers nationwide	1	1,825	Online live streaming
Artificial intelligence to help build the teaching force	All teachers in our school	2	200	Offline
Digital and humanities	All teachers in our school	1	45	Offline

Second, the platform provides rich resources for teachers' training. Providing rich learning resources for teachers' professional development is an important foundation for promoting teachers' independent development. The teaching resources provided for teachers on A University's teacher professional development platform include a collection of common problems in teaching, excellent short videos shared by teachers, teaching ideas of outstanding teachers, teaching methods, teaching research papers, and teachers' teaching portfolios. These resources share the practices, experiences and achievements of outstanding teachers from different perspectives. For other teachers, they can play a good role in leading and modeling. Teachers can browse and download the learning resources they need on the platform independently for their own teaching scenarios, or they can share their achievements and insights and share resources with their peers.

3.2 Building Teaching Portfolios to Promote Reflection on Teaching

Teaching portfolios are an important tool to facilitate teachers' reflection on teaching. Nowadays in many countries such as US, UK and Canada, teaching portfolios is effective to help teachers' professional development (Wang, 2005). Institutions adopting teaching portfolios could profit from monitoring their development, implementation and impact (Burns, 1999). However we found in a survey that teachers were unfamiliar with the concept of teaching portfolios, as shown in the figure. This has brought about a lack of motivation and a lack of mastery of the construction methods by teachers to build teaching portfolios. For this reason, we also provide guidance and support to teachers in building teaching portfolios by organizing seminars. In the construction of the teacher professional development platform, we reduce the workload and technical threshold for teachers to build teaching portfolios by automatically integrating data on teacher development in through technical support. While automatically integrating data, we also support teachers to build and form teaching portfolios on their own to support their self-directed development. For example, teachers' activities on the professional development support platform automatically generate some of the process data of professional development, and the platform accumulates these data in an organized and purposeful way to help teachers form the prototype of a teaching portfolio. The platform not only allows teachers to choose their own resources and activities for professional development, but also provides them with an objective and comprehensive understanding of their teaching professional development process and helps them to conduct evidence-based reflection on their teaching.

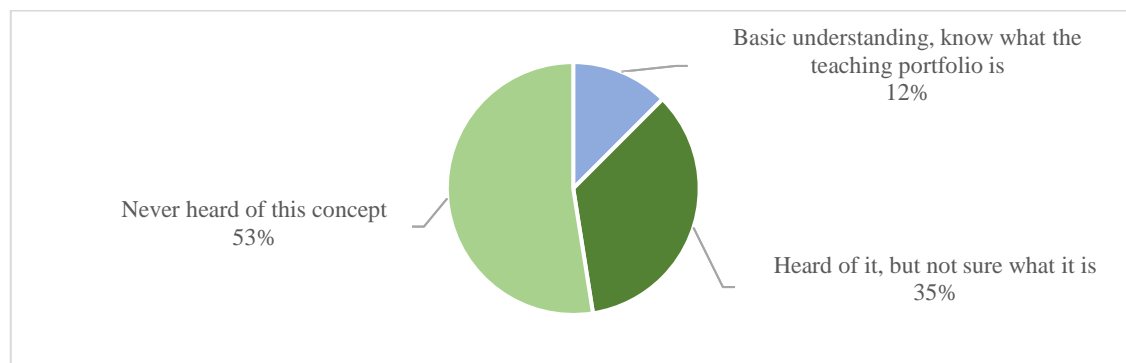


Figure 3. A survey of the familiarity of teaching portfolios

At present, A University teachers organize their teaching resources and reflect on their teaching based on the framework of teachers' teaching portfolios on the platform and have formed teaching portfolios with different content focus. For example, through the construction of the curriculum thinking and politics teaching portfolios, teachers have been able to deeply explore and refine the ideological values and spiritual connotations contained in the knowledge system of the curriculum, refine the elements of curriculum thinking and politics, and build a portfolio with curriculum thinking and politics as the core. The project has been in progress for one year since the start of the Curriculum Civics Cultivation Project at A University in 2021, and more than 120 Curriculum Civics portfolios have been built on the platform. Some teachers have also reflected deeply on how to use digital and artificial intelligence technologies to improve teaching in the course of teaching through the construction of teaching portfolios, and have built and formed cases of teaching portfolios with technology boosting course improvement.

3.3 Create a Profile of Professional Development and Recommend Resources

User profiling is a tool for profiling and analyzing the behavioral characteristics of users by extracting data tags. Through the establishment of profiling models, users' personalized needs can be effectively explored and matched with accurate service resources. As an effective tool to profile target users and improve decision-making efficiency, user profiling is widely used in many fields (Zhang, 2020). Teachers' professional development support platform can record the whole process of teachers' professional development behaviors, such as teachers' preference for training topics, their choice of learning formats, their activity in sharing and communication, and the teaching practice issues they are concerned about. Through the analysis of teachers' behaviors on the platform, teachers' professional development paths and portraits can be formed.

The platform diagnoses and plans teachers' professional development based on their professional development profiles, and provides more targeted resource recommendations (including training activities, articles, resources, etc.). At the same time, teachers can also get their own professional development radar chart to help them objectively and comprehensively understand the characteristics in their teaching professional development, and then better plan their teaching professional development.

3.4 Build an Online Communication Community to Form a Learning Community

Connectivism, as the guiding ideology of learning in the form of Internet education, believes that knowledge circulates in the interaction between people, and that everyone is both a contributor and a transmitter of knowledge (Goldie, 2016). As a platform to support teachers' professional development, it also provides a community of information sharing and crowdsourcing for teachers' learning that is not dependent on temporal and social relationships. In this online community, learners contribute knowledge together, forming collective perspectives and enhancing individual learner development in a network collision (Qin & Zheng, 2020).

The role of the teaching professional development support platform in community building is firstly to meet different teachers' professional development needs. For teachers needing practice-reflections, the platform supports the teachers to accumulate information about their practice and reflective writing in private personal teaching portfolios; for teachers with ecological orientation, the platform provides social functions such as posting topics, leaving comments and sharing. The teacher professional development platform supports teachers' self-directed development not only by providing resources, but also by building and forming online learning communities and providing opportunities for teachers' peer collaboration to exchange and cooperate. Self-directed learning emphasizes learners' self-management, self-regulation, self-evaluation, and responsibility for learning, but this is not the only way teachers develop professionally; teachers also need to engage in collaborative learning, inquiry learning, and other-directed learning in the process of professional development. Learning communities are therefore an important support to help teachers seek cooperation and solve problems by sharing knowledge, experience, materials, and resources among teachers in order to promote the improvement of teaching ability and professional development of individual teachers and teacher groups. Based on the learning common learning body, peers can discuss teaching confusion together and seek expert guidance for answering questions.

Although from a connectionist perspective, communities are not primarily knowledge-generating; knowledge and content are primarily generated by the participants in the community, however, in the initial stage of community development, in order to strengthen the interaction among teachers and guide them to think about teaching methods and practices from different perspectives such as theory, practice, and culture, the construction of the community is also interconnected with the pedagogical development project module in the platform. For example, if teachers are involved in a particular topic of teaching and training, they can further explore and share resources on that topic in the community. At the same time, in the community, teachers can find partners with common learning characteristics and content preferences.

4. CONCLUSION

The construction of the professional development support platform for teachers at A University has been at the forefront in China, supporting teachers' independent development by providing them with rich professional development resources and focusing on teachers' active reflection and peer collaboration on teaching at the same time. To summarize this round of research, we believe that the construction of a teacher professional development platform under the concept of self-directed learning is a continuous development process, and the accumulation and integration of data is the key to forming a portrait of teachers' professional development and an important foundation for the platform to provide accurate services to teachers. While students' behavioral performance and mastery of knowledge in a course are relatively concentrated within a single scope, teachers' pedagogical development is a long-term process that spans their entire professional development journey, so the construction of a teacher professional development platform requires greater integration and completeness of data. And this is the primary challenge in building a teacher professional development platform, especially one that is to support teachers' self-directed development. Secondly, at the early stage of online teaching community construction, teachers are often not highly motivated to participate, so they need to be motivated to take the initiative to share resources and wisdom in the community, and gradually form a community with scale after a period of popularity gathering, in order to better play the role of contributing knowledge and producing knowledge together in the community.

Taking the support platform for teachers' teaching professional development at A University as an example, this paper systematically elaborates the design ideas and implementation of the platform construction under the concept of self-direction, and analyzes the value and challenges of each construction module, hoping to provide some thoughts and inspiration for the construction of the platform and teachers' professional development.

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