

The Ecological Thinking of Teachers' Group Professional Development Based on Network

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Abstract. The trend of teacher professional development is from individual to the group, the development of Internet has provided a broader platform for it, which can analyze the professional development of teachers group in a more systematic perspective. This paper discussed the ecological system of teachers' professional development groups, build an ecological model based on network, and then followed the principles of ecology; put forward some feasible ecological strategies to promote effect of teachers' group professional development.

Introduction

During the past decade, literature on teacher profession development has flourished, but the definition of teacher professional development (short for TPD hereafter) is still evolving and remains obscure. Based on different object and different understanding of TPD, there are many kinds of views and approaches, in short, we can divide it into three kinds: intellectual approach; practical-reflective approach and ecological approach. TPD under ecological approach emphasized "teacher culture", "community", "collaboration" and "context". It considers that TPD is not only achieved by teachers' personal learning and practical reflecting, the more important point is to form collaborative professional development culture and model [1]. At present, ecological approach has become major trend; the development of Internet has provided a broader platform, which can more effectively realize the community of teacher professional development.

The Ecological system of Teachers' Group Professional Development Based on Network

Ecological system refers to a perpetually dynamic, complex system with continuous adaptation, energy conversion, material circulation, metabolism and information transfer function in a certain region (or space) [2]. Similarly, the ecological system of teachers' group professional development based on network (short for TGPDBN hereafter) refers to a dynamic whole of regulating function, composed of teacher's ecology subject and corresponding ecological environment through the network interaction, teachers can break the constraints of time and space, forming groups with different forms, which relatively independent and interrelated. Among the system, in order to seek personal and teachers group professional development, the constituent elements mutual promotion and mutual restriction with the material circulation and energy flow, resource sharing. The development of network technology makes TPD break the normal procedure provides an open platform and rich support tools. This is a dynamic process of sustainable development. In general, the ecological system is composed of two parts: the ecological subject and ecological environment.

Ecological subject. Human being is the active subject of Ecological systems, which is also the only species. There are two main groups of species in TGPDBN: teacher specie and the service specie for teachers. The teacher specie refers to all teachers of different disciplines, different levels and different regions, it includes not only teacher as a human life system, but also a system of the individual and group teachers' professional quality structure [3]. The service specie for teachers refers to organizers,

managers and monitor of network platform, such as resource management staff, learning support service personnel. This paper focused on the activities of teachers species.

Ecological environment. In the ecology view, any kind of ecological subjects living in ecological environment, restricted by ecological environment. In the ecological system of teachers' group professional development, the ecological environment is based on the network platform to provide multi-level interactive space, including the social environment, learning environment and support service environment.

The social environment is a highly organized complex system, which consists of various elements in society [4], such as politics, economy, structure, population, culture and technology. Learning environment refers to all kinds of learning resources to meet the teacher professional development needs. Support environment for service refers to the provision of all environmental factors for teachers, including interactive platform, facility environment, network environment and information environment.

The ecological model of teachers' group professional development based on network

The ecology of education pay attention to comprehensive contact and overall value, emphasizes the dynamic process, pursuing sustainable development [5], the core idea in accordance with the concept of ecological orientation of teachers' group development, provides a new perspective for development of teachers group research. According to this view, the ecological subject group and the ecological environment mutually independent and contact each other in TGPDBN, using figure 1 can reveal a more detailed way of interaction between various factors in the system and formation of ecological model.

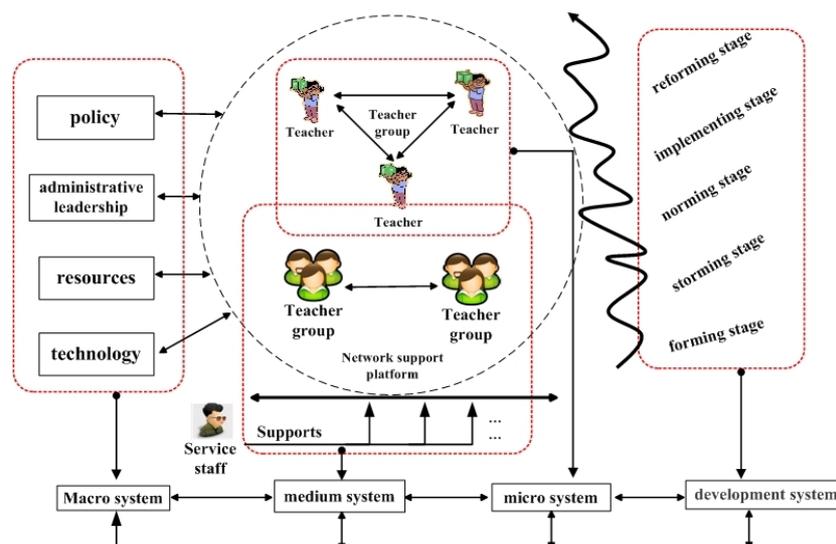


Fig. 1. the ecological model of teachers' group professional development based on network

Ecological subject and ecological environment interact with each other, according to the directly degree that the behavior system influenced on the development of people, the overall ecological model was divided into four subsystems: the micro system, medium system, macroscopic system and development system (as showed in figure 1).

Micro systems. It reflected the most direct effect relationship, between ecological subject, between ecological subject and near ecological environment, such as teachers personal learning activities in network platform, writing logs, making use of resources; teacher members communicated, shared and collaborated, formed groups in the network platform of mutual etc. The development of micro system will further contribute to the generation and development of medium system, will also affect the development of macro system and development system.

Medium system. It mainly referred to a variety of interactive activities in the network platform, such as activities between personal and teachers' group, among groups, also included the interaction with the ecological environment (such as learning environment, support service environment). The groups may be a discipline, a school, a regional or other informal groups, such as information exchange cross regional, collaborative lesson preparing, thematic discussions and training etc. the medium system includes the process of micro system, also shock to other macro factors and teachers' professional development system.

Macro system. TPD is a multi-level, multi structure ecological system. The macro system is part of social ecological environment; it included the social macroscopic factors involved in the professional development of teachers group, such as policy, value orientation, administrative leadership and resources, but also subject to impact of the whole social system changes, technological environment constraint factors. The macro system affects the development of the micro system, the medium system and ecological subject.

Development system. Development system highlighted the professional qualities of teachers individual and groups. The development of group is a dynamic process, According to Tuckman and Jensen (1977), a group forming (not necessarily virtual) can be defined in five stages: forming, storming, norming, performing and adjourning. Correspondingly, we divided the teacher development into five stages, namely the forming stage, storming stage, norming stage, implementing stage and reforming stage. For personal professional development needs, Teacher seeks or joins the corresponding group based on the network development platform. When teachers see themselves as group's member to think, the virtual community is formed. At the storming stage, teachers accept the existence of groups, but there will be some contradictions. At the norming stage, the relation between teachers is further close through interaction, and presents a certain cohesion and internal driving force. Subsequently, group structure tends to be stable, members reached a consensus widely. They shared and collaborated to promote professional development; the process went into the execution phase. In order to complete the other aspects of the study or the next phase of development, the teacher maybe added to the other group. The five stages is a continuous cycle, shown as irregular curve in figure 1.

The stage of teachers' group professional development is affected by development of macro system, medium system and micro system, and this system development process will effect reversely on other systems, shown in Figure 1 as two-way arrow among four systems.

Ecological strategies to enhancing the effect of teacher professional development under the network environment

Creating a good network ecological environment, establish the view of ecological learning. The view of ecological learning means that according to their own learning needs, learners actively select and use suitable learning resources and support service, allocate time reasonable, continued to maintain a good learning state, get good learning results [7]. To make the group of teachers under the network environment play a long-term effect, it needs to create a good network ecological environment, help teachers establish the view of ecological learning.

First, strengthening the construction of learning resources. Full investigation and analysis is necessary to meet the needs and interest of teachers. Form diversifications, innovative content, timeliness strong are the main character of high quality resource. At the same time, urge teachers to make full use of the learning resources, and actively restructuring resources. If a resource has already outdated, teachers should carry on the constantly updated to build rich, high quality resource.

Secondly, paying attention to improving learning supports service system. As a core structure of TGPDBN, the purpose of Learning support service system is providing learning support environment for teachers anytime anywhere. The key lies in building collaboration and interaction environment for teacher's development, doing a good job in transmission and distribution of resources, organizing and managing the whole process of teaching, providing guidance and consultation of development, helping teachers to solve difficulties.

Identifying the "niche" to promote teachers' individual professional development. Niche refers to the status and role of species in the biological communities or ecosystems, this concept can be extended as "proper position, satisfactory post, adaptive interest, capacity and environment". Members in TGPDBN are interrelated, teacher's role and influence is more crucial than other models.

Teachers must find their own niche, Such as their location, roles, ability, interest and demand, expectations of professional development, support obtained from the group, contribution to group and so on. On the basis of this, each members show their specific behavior patterns in the community, strive to become a key species in the group.

The "key" role of teachers should be strengthened. They not only pay attention to their individual professional development needs and direction, but also the development trend and needs of whole ecological groups. Sometimes, they can organize and control the group development, leading and guiding timely. Such as when a teacher's performance is not active or direction is not clear, "the key" teachers provide corresponding help, so as to promote online community development activities better.

Eliminating the restriction factor, strengthening teacher groups' interaction. Diversity role of members determines the population structure; the interactive mode of teachers is an important way to promote the professional development. It will affect the teachers' development of individual and groups.

Online interactive activities among teachers, including individual and individuals, between individual and group, between group and group. Eliminating possible limiting factor of the ecological system to promote the interactive activities carried out smoothly.

First of all, solving technical problems in the network platform. The technology level of teachers participating in the network development group is very different, so it is necessary to ensure the usability, effectiveness, safety and flexibility of the platform. Secondly, solving the issues of specification and network group activities. Network group activities based on network should follow certain rules, in the process of members interaction should follow the corresponding rule as well [8]. Therefore, it is necessary to establish and perfect a series of norms and standard, such as supervision mechanism, reward and punishment mechanism, authority mechanism etc.

Finally, solving the compatibility of virtual and authenticity in the process of teachers professional development. Online professional development is different from development based on school or region in the ways, and the performance. Therefore, school and educational administrative departments may formulate relevant rules and norms to combine the online and offline development, increasing teachers' motivation and enthusiasm of network group development.

Strengthening the overall effect, forming the ecological community culture. Teachers' community culture based on network is that teachers gathered in the network platform, through long-term development, gradually formed widely accepted common belief. It includes teachers' professional consciousness and spirit, instruction philosophy, ethics, management system and thus reflected the common behavior characteristics and the spirit of teachers.

At present, teachers encountered many practical problems in the process of development, such as resource bottleneck, development crisis, and then they seek outside help. Teachers gathered and formed group activities through the network. The effect of activity largely dependent on group members, they participated, interacted with others, shared resources and formed a common vision in virtual environment by mutual assistance. It can increase teachers' sense of belonging, trust and mission. Ultimately the ecological culture of teacher groups is formed.

Preventing the teacher ecological crisis, achieving the system cycle balance. In the process of teacher professional development, some deep-seated problems such as, backward concept, lack of resources, closed exchange, discipline development imbalance have become a bottleneck restricting, teacher professional development has encountered the ecological crisis.

The ecological balance is the core concept of ecological system. Therefore, we should make full use of the open and richness of the network platform, strengthening the circulation and energy flow in ecosystem. Secondly, teachers' personal and group development cycle balance has to be strengthened. In the process, attention should be paid to every teacher in ecology in groups, providing the best

service for the support to promote its potential and enthusiasm. Urges the different groups to complete the evolution stages in the process of interaction, thus promoting the ecological system evolution.

Conclusions

Based on the principles of ecology, it can be concluded that the nature of TGPDBN is to realize mutual adaptation and sustainable development of all component, finally to pursuit teachers' group development goals. It enables teachers develop from the individual to the group, combined with the network and the reality, as teacher policy security and network platform gradually improved, with the development of leading group experts and teachers' autonomous development, the network will play an increasingly important role in the development of the teachers' group, the development goals of the whole ecosystem will be achieved.

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