

# Research on the Structure of Virtual Learning Communities under the View of Ecological Learning

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**Abstract**—Virtual learning communities(VLCs) is an effective way for people to conduct online education. Constructing and perfecting the network learning environment can effectively improve the effectiveness of online learning. This paper analyzes the basic characteristics of virtual learning community from three dimensions: technology, education and sociality. On this basis, it constructs a sustainable virtualized virtual learning community environment at the individual level, social level and ecological level.

**Keywords**—Virtual learning communities, online education, Ecological Learning

## I. INTRODUCTION

With the rapid development of information technology and the continuous expansion of cyberspace, more and more people use the virtual learning communities to learn. VLCs have become an effective approach to online education and for people to build lifelong learning system because of its advantages of convenience, equality, interaction and sharing. VLCs based on network have become an important research field.

Learning is a complex process that cannot be fully explained by a single theory. In view of the many problems that arise in the construction of virtual learning communities in China, the development of ecology provides a new perspective for us to study the VLCs environment. Based on the analysis of the basic characteristics of the VLCs, this study intends to use the ecological learning concept to analyze the learning environment of the VLCs environment and the learning environment on which it depends, and to propose useful ideas to reconstruct VLCs and promote the begin development of the VLCs.

## II. THEORETICAL BACKGROUND

### A. Concept Development of the VLCs

VLCs are the product of information and communication technology and the new concept of education in network applications. For example, Rheingold first proposed that the virtual communities are a group of people who communicate and discuss each other mainly through the network. [1] They have a certain degree of understanding and full feelings, share some degree of information and knowledge, and form a social collection of personal relationship networks in cyberspace. Yongcheng Gan believes that VLCs are a virtual learning environment constructed on the Internet by a learning group composed of people with common interests and learning purposes[2]. They use a variety of network communication tools to promote knowledge construction and sharing ideas, ideas, resources, knowledge, learning experiences and collective wisdom through mutual communication, interaction, discussion and collaboration, and collaborative learning. Wenhui Peng proposed that virtual community is a new distance education network teaching support platform based on constructive learning theory, computer information processing technology, computer network resource sharing technology and multimedia technology[3]. Wang Lu believes that the VLCs are a collection of community members and their relationships in a network environment, that is, its essence is a social network[4]. VLCs are a new type of learning organization, so it is not only has sociological attributes and also has the basic attributes of human-machine systems. VLCs are products of the combination of modern social needs and scientific machine teaching and learning theory.

The early virtual community is a virtual social relationship collection. It is a social network formed by people in different regions through the network. With the development of information technology, the geographical boundaries of traditional communities are weakened, they have common interests and are willing to exchange information through the network. And shared individuals gather on the network and eventually form a virtual community. The virtual community is not only a new social structure, but also an information system. With the deep application of virtual communities in the fields of finance, information systems, e-commerce, knowledge management, enterprise innovation, online learning, etc., the research wave of virtual learning communities with the purpose of promoting learning and improving learning performance has gradually formed. A large amount of research work and research perspectives have expanded from an early single-disciplinary perspective to a multi-disciplinary perspective. Therefore, research should be analyzed from different perspectives, such as educational

technology. Knowledge and methods in the fields of sociology, information management, communication, knowledge engineering, and ecosystems.

### B. The Ecology of Learning

The ecology of learning was first proposed by Jan Vesser. He analyzes learning from an ecological perspective and believes that learners coexist, dynamically evolve, and co-evolve with the learning environment on which they live. VLCs can be regarded as a learning ecosystem. Individuals with different levels and differences have good common interests to learn and realize meaning construction. Ecology is an open and complex adaptive system that includes a series of powerful, interdependent elements[5]. George Simmons further expands the ecological perspective[6]. Qi Chen proposed an integrated ecological learning model from the perspective of ecological outlook[7]. Jinchang Yu analyzes and interprets the ecological characteristics of virtual learning communities from the perspective of ecological learning concept[8]. Lixin Zhang considers that the online learning has both internalization and explicitness, individual and group are equal, sharing and connectivity[9]. The concept of ecological learning has created a new way of thinking about learning behaviors.

## III. RESULTS AND DISCUSSION

### A. Basic Characteristics of VLCs

From the concept development of VLCs, we can find that it follows the development of “community-virtual community-virtual learning community”. Therefore, sociality, virtuality and education are its three basic characteristics. We can analyze VLCs based on these three characteristics. Many scholars have given similar conclusions when analyzing the basic characteristics of VLCs. For example, Tu constructed a triangular theoretical model of VLCs [10]. The three sides of the triangle represent the three dimensions of VLCs: the teaching dimension, the social interaction dimension, and the technical dimension. Among them, the teaching dimension includes interactivity, community learning and collaboration; the social interaction dimension includes social background, social culture and social cognitive environment; technical dimension refers to the construction of virtual learning environment. Carabajal analyzes the basic characteristics of virtual learning communities from three dimensions: technology, learning tasks, and social interaction. The technical dimensions in these research conclusions are similar to the virtual ones. The technical dimension determines the digital environment characteristics of VLCs, that is, the characteristics of the virtualized environment, mainly represented by the virtual space, the digitization of resources and the openness of the interaction process; teaching dimensions, learning task dimensions and education are similar, mainly emphasizing that the main purpose of VLCs are to disseminate, communicate and share knowledge and serve the community members. The dimension of social interaction is similar to sociality. It is the main feature of the community. It is the relationship between the learners and the cultural habits formed by the learners in VLCs. Therefore, we can analyze the basic characteristics of VLCs from three dimensions: technical, educational and social.

The basic characteristics of the technical dimension are as follows:

- (1) The virtual learning community is a computer-based information system that supports people's learning across time and space.
- (2) The virtual learning community is an online learning environment that is a support system that maintains the atmosphere and context of the learning process.
- (3) The virtual learning community provides a free, open and ecological learning environment for a diverse learning communities. The learning environment includes the material foundation, the information resource environment and the social environment.

The basic characteristics of the educational dimension are as follows:

- (1) To meet the educational requirements, provide learners with a variety of learning resources, and promote the achievement of learners' goals and ability. With the development of the communities, the resources of the community will be constantly enriched.
- (2) To meet the requirements of communication and interaction, community members can communicate synchronously or asynchronously, promote the externalization, transmission and sharing of invisible knowledge, and accomplish certain learning tasks. With the collision of ideas and emotional exchanges between members, the community will develop and prosper continuously.

The basic characteristics of the social dimension are as follows:

- (1) Community members form a learning group through interaction and self-organization, and the interaction process is not limited by geographical regions.
- (2) Community members share common goals and interests, learn from each other, exchange learning experiences, and are willing to take responsibility and obligation to learn the community.
- (3) Community members are based on trust, generate close and identity relationships, and have a strong sense of belonging to the community.

(4) Individual interaction, group composition process is essentially a social exchange process and belongs to the part of Internet production and consumption.

(5) A community of ecological social relations with a common community cultural psychology formed by a diverse learning group.

Therefore, VLCs are not only an information system, but also a new Internet-based ecological learning community formed to complete online or realistic learning needs. It has the basic attributes of information systems, education and sociology.

#### B. Analysis of virtual learning community structure based on ecological learning view

This paper consider that learning is an update of self-knowledge and behavioral optimization that takes place in a specific environment, and that renewal and optimization come from individuals and the environment, and The interaction between individuals, while learning is a process that needs to be sustained and strengthened. Therefore, organically integrate various learning concepts, technical resources and social collaboration tools, examine the learning process from an ecological perspective, and regard the virtual learning community as a learning ecosystem, which is conducive to transcending the previous single orientation and focusing on a certain element. The limitation is which should be analyzed with a broader perspective and then promote the sustainable development of the VLCs.

VLCs can be analyzed from the three levels of individual, social and ecological layers. Each level can be regarded as a subsystem of ecosystem. The learners participate in VLCs as individuals. In the middle, the main body of learning is gradually transformed into individual learning community and bio-community. Learners obtain material, information and energy in various levels of environment, and promote the continuous circulation of material flow, information flow and energy flow in three levels. Thereby enhancing the individual's ability, promoting the overall environmental development, and ultimately building a sustainable and ecological virtual learning community environment. At the individual level, learners choose certain technologies and media according to their own needs, and build their own knowledge through the platform to obtain certain learning performance. At the social level, learners gather in the common interest target. Together, follow the common code of conduct, develop into a learning community, form a sense of trust and belonging in the interaction, enhance the community's stickiness, continuously improve their learning performance and promote the healthy development of the community; in the ecological layer, different themes and interests The learning community constitutes a diverse ecological community. Learners draw different learning nutrients in a diverse ecological environment, improve individual innovation performance in reciprocal symbiosis, and promote the prosperity and development of virtual learning communities. As shown in Fig. 1

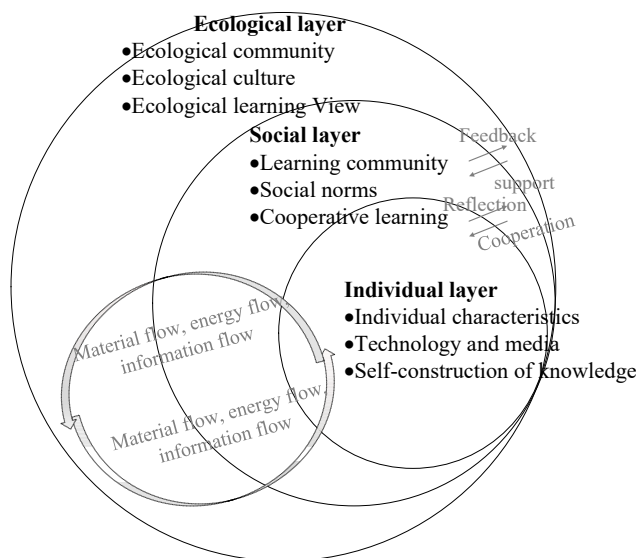


Fig. 1 Ecological structure hierarchy diagram of virtual learning community environment

#### IV. CONCLUSION

The purpose of this study is to analyze the basic characteristics of VLCs and the ecological structure from an ecological perspective, so as to promote the prosperity and development of VLCs.

#### ACKNOWLEDGMENT

The authors would like to thank the support from the National Natural Science Foundation of China (No. L1624041) .

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