Success Factors in the Construction of Virtual Learning Community: Based on A Survey of Curriculum Practice in Chinese Universities During the Epidemic

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Abstract

Learning community can promote students' mastery of knowledge and skills, as well as the development of cognitive ability and psychology. With the advent of the information age, the research of virtual learning community has gradually become a hot spot in the field of learning community study. During covid-19 epidemic, online teaching has been carried out in universities on a large scale. In this process, the construction of virtual learning communities provides an opportunity for learning community research. In the past research on virtual learning community, the main focus is on theoretical study. The possibility of using the network platform to establish a learning community is still being explored and there are few practical researches. Most of the researches focus on the strategy of promoting the establishment of the learning community in a certain course and network platform, but have not found common methods to organize and promote the virtual learning community. In the relevant research on online teaching under the background of covid-19, researchers conduct research from the perspectives of teaching methods and the use of Internet technology, but less from the perspective of the learning community. This study selected four courses of different majors from three universities during the epidemic, and conduct a questionnaire survey on the institution, common goals, interactive communication, and student learning effectiveness of the class learning community and group learning community. The questionnaire survey collected 105 samples, and use SPSS software for descriptive analysis and correlation analysis. The results found that we should pay attention to the establishment of the reward mechanism and common goals, the division of labor and active and efficient interactive communication between the members when constructing virtual learning community. These methods can effectively improve learners' participation in the learning community and learning effectiveness. It is hoped to provide some references for the development of online teaching in the post-epidemic era.

Keywords

Virtual learning community; Institution; Common goal; Communication and interaction; Learning effectiveness.

1. Introduction

The learning community is a learning collective guided with a cooperative learning view in the learning process, which influences and promotes each other through negotiation and sharing of various learning resources.1

Although past researches have shown the superiority of the "virtual learning community" to a certain extent, and have put forward some suggestions for constructing a "virtual learning community", its limitations are still obvious.

First of all, the past case studies were mostly small-scale and short-term experimental studies. Curriculum that can be designed may affect the behavior of teachers and students participating in the research, which will reduce the credibility of the research results, so recommendations they proposed may not be universal. Jiang Qiang, Liu Hongyan, and Zhao Wei (2008)2 at Liaoning Normal University found that the students who participated in the courses "Sky Network Teaching Platform" learned better than that of students who studied as an individual. Zhao Ling (2010) of Shanghai Ocean University put forward a basic structure of college English teaching model based on the network learning community, which can enhance communication among students, arouse students' enthusiasm for learning, and fully demonstrate the individuality of students than traditional college English teaching. [4]3

Second, the past research mostly focused on a certain subject, course or a certain platform, such as QQ group (Zhong Zhirong 2011)4 and MOOC (Cao Chuandong 2016).5 There were few practical researches on virtual learning communities, and they did not propose common methods to promote the construction of virtual learning community.

Under the background of covid-19 in 2020, colleges were forced to fully implement online teaching. The practice of virtual learning community in universities under the epidemic is a huge and natural database. This research will select some representative cases for analysis and comparison, and put forward suggestions that can be extended to regular courses.

2. Literature Review

Regarding to the constituent elements of a learning community, different scholars divide it to different perspectives according to the characteristics of the learning community. Kuang Shanyun (2005) believes that there are three constituent elements: learners, scholars and information flow.6 Zhong Zhixian (2005) divides it from the perspective of emotions and believes that the learning community is composed of four major components: a sense of belonging, trust, reciprocity and sharing. 7Liu Wei (2003) holds the view that the learning community includes participants, the formation process, team tasks and the form of learning activities. 8Based on the above literature, the constituent elements of the learning community mentioned in this study are participants, contracts, shared goals, and learning activities.

Researchers study the realistic learning community, virtual learning community, hybrid learning community (Li Zhihe20199, Tong Hui 201910), Classroom learning community, residential learning community, student type learning community, etc according to the construction methods of the learning community's platform and purpose. This study will use these classifications as a reference to do research.

The results of a number of studies have shown that the learning community has a significant impact on students' knowledge and skills, cognitive ability as well as psychology.

From the perspective of knowledge and skills learning, the learning community helps students improve academic performance, accumulate social experience, and acquire cross-domain knowledge and skills. (Zhao Chunmei and George D. Kuh,200411) In terms of cognitive ability and psychology, students participating in the learning community increased their cognitive

abilities, learning motivation and self-efficacy in all dimensions, and their anxiety about exams and control over learning beliefs decreased. (Stefano and Salisbury Glennon,200212)

In response to the online teaching in colleges during covid-19 epidemic, some scholars have carried out research based on the specific implementation of different colleges and universities, and they have designed different teaching methods to solve the problems caused by online teaching. However, these are all case studies of specific curriculum teaching methods, and there is no research from the perspective of the learning community.

3. Research Questions

This research uses a variety of methods to study the interactive participation of students in different forms of virtual learning communities, aims to promote the construction of learning communities and improve the participation of students.

Two questions guided this research:

1. How to improve learners' participation and learning effectiveness in the learning community?

2. How to find specific methods to help students establish and develop different forms of learning communities?

3.1. Data Analysis

This research investigated four courses in three universities using questionnaires. According to the nature of the course, two questionnaires, the class learning community questionnaire and the group learning community questionnaire were designed. The questionnaires were conducted from five dimensions: basic information, institution, common goals, interactive communication and learning effectiveness.

59 valid answers were collected from the class learning community questionnaire and 46 valid answers were collected from the group learning community questionnaire.

3.1.1. Reliability Analysis and Validity Analysis

The reliability analysis was conducted using SPSS. The results showed that the Cronbach's alpha = 0.885 for the class learning community questionnaire and 0.869 for the group learning community questionnaire. The coefficients were all greater than 0.8, indicating that the internal consistency of the questionnaires was good and the questionnaire results were reliable.

The results of the Kaiser-Meyer-Olkin test appeared as shown below. The class learning community: KMO = 0.749, Bartlett p-value < 0.001. The group learning community questionnaire: KMO = 0.716, Bartlett p-value < 0.001. Using principal component analysis to extract factors, we can see from the results of factor analysis that the four dimensions of institution, common goals, interactive communication and learning effectiveness of questionnaire design have certain similarities, and the rationality of questionnaire design is acceptable.

3.1.2. Descriptive Analysis

3.1.2.1 Institution

In the investigation of class learning community, 78% of the respondents think that there are clear and definite rules in the classroom (> = 4), and 77.2% think that these classroom rules have strong binding force on them (> = 4). The classroom rules in the class learning community are a kind of contract between teachers and students. Compliance with the contract can help to carry out the learning activities in the learning community.

In the investigation of group learning community, students have some different opinions on the way to determine the group members. 67.4% of the students prefer the way of free combination, while 17.4% prefer the method of random combination, and only 4.3% of the respondents hope that the teacher can determine the group members.

3.1.2.2 Common goals

The positive evaluation (> = 3) of students on the common goals in every aspects is greater than 90%, in the two different learning community. We believe that students have basically reached a consensus on the effect of common goals to stimulate learning enthusiasm, clearing learning goals and directions, and enhance the sense of community belonging.

3.1.2.3 Interactive communication

In class learning community, 67.8% of the students were positively evaluated on the frequency of communication with teachers, and all other aspects about the effect of interactive communication get more than 90% positive evaluation(> = 3).

In group learning community, the positive evaluation of the effect of interactive communication (> = 3) is higher than 80%. It can be considered that the willingness and effect of communication and sharing within the community are strong.

3.1.3. Correlation Analysis

3.1.3.1 Institution

According to the data of class learning community, the advanced reward mechanism is positively correlated with knowledge and skills (rho = 0.552, p-value < 0.001), time and learning management (rho = 0.388, p-value = 0.002), making progress in learning with peers (rho = 0.325, p-value = 0.012), learning motivation (rho = 0.262, p-value = 0.045) in the dimension of learning effectiveness.

The data of group learning community showed that there is a positive correlation between clear division of labor and knowledge and skills (rho = 0.356, p-value = 0.015), learning motivation (rho = 0.335, p-value = 0.023). Thus, it is concluded that group division of labor can promote the group learning community.

3.1.3.2 Common goals

In both class and group learning community, knowledge and skills were significantly positively correlated with learning enthusiasm stimulated by common goals (rho = 0.449/0.374, p-value < 0.001 / = 0.010) and clear learning purpose and direction of learning effected by common goals (rho = 0.483/0.339, p-value < 0.001).

Similarly, there was a positive correlation between learning motivation and clear learning purpose and direction of learning effected (rho = 0.268/0.325, p-value = 0.040/0.027) and learning enthusiasm stimulated by common goals (rho = 0.356/0.441, p-value = 0.006/0.002).

Making progress in learning with peers was positively correlated with the increased sense of belonging and cohesion effected by common goals (rho = 0.273/0.349, p-value = 0.036/0.017).

In class learning community, time and learning management were positively correlated with clear learning purpose and direction of learning effected by common goals (rho = 0.312, p-value = 0.016). In the group learning community, there was not enough evidence to support this result.

In addition, in the group learning community, the ability to negotiate the topic was positively correlated with knowledge and skills (rho = 0.589, p-value < 0.001) and making progress in learning with peers (rho = 0.474, p-value = 0.001).

3.1.3.3 Interactive communication

In the class learning community, the frequency of communication with teachers was positively correlated with knowledge and skills (rho = 0.350, P = 0.007) and learning motivation (rho = 0.399, P = 0.002).

There was a significant positive correlation between feedbacks from teachers and learning motivation (rho = 0.390, p-value = 0.002).

Approval and encouragement from teachers were positively correlated with learning motivation (rho = 0.372, p-value = 0.004).

The resources shared by teachers stimulated the interest in related professional fields, which was positively correlated with knowledge and skills (rho = 0.472, p-value < 0.001) and learning motivation (rho = 0.341, p-value = 0.008).

To draw a conclusion, the interaction between teachers and students in the community can not only help students improve their knowledge and skills, but also enhance their learning motivation.

In the group learning community, making progress in learning with peers, which was positively correlated with the help brought by encouragement and affirmation of group members (rho = 0.360, p-value = 0.014), answering the doubts of other group members (rho = 0.451, p-value = 0.002), actively expressing their own views and opinions in the group (rho = 0.321, p-value = 0.029) and the collision of ideas and opinions among group members (rho = 382, p-value = 0.009), members can raise and solve their own problems in the community discussion (rho = 0.476, p-value = 0.001).

The resources shared in the group stimulated the interest in relevant professional fields, which was positively correlated with knowledge and skills (rho = 0.406, p-value = 0.005) and learning motivation (rho = 0.398, p-value = 0.006).

It follows that the interaction and communication within the group learning community can significantly affect the improvement of the cooperation ability of the group members, and the resources that stimulated the interest can not only improve of members' knowledge and skills, but also enhance the learning motivation within the learning community.

4. Discussion

The investigation of four different types of courses in this research found that it can promote the construction of learning community from three aspects.

4.1. The Learning Community Should Establish and Reasonably Use the Reward Mechanism as Well as Pay Attention to the Division of Labor

The first is the institution of the learning community. In the form of the classroom learning community, it is specifically manifested in the establishment and implementation of the reward and punishment system. The research (Andreoni J, Harbaugh WT, Vesterlund L. 2003) has examined the effectiveness of punishment and/or reward incentives in enhancing cooperative behavior in humans.13 It is found that teachers will give different levels of rewards to students' speeches, homework and display content. For instance, in some courses, teachers will display students' excellent work on public platforms, whether it is answering questions or the homework display can improve the reputation of students to a certain extent, thereby inspiring their enthusiasm as participants in the learning community. Teacher will assess students' behaviors of the course according to the number of questions they answered, the quality of daily homework, and final exam results. Thus, Teachers should reasonably use the reward mechanism in the classroom teaching process to improve student participation and the activity of the learning community. However, it is found that there is no sex difference in reward-guided associative learning but a faster punishment-avoidance learning in females. (Chowdhury, T.G. 2020)14So the implement of reward and punishment in leaning community toward different sex may need further exploration.

In addition, attention should be paid to the division of labor and implementation in the group-based learning community. First, when setting up a group, teachers should give students more power to choose. At the same time, they should also advise them to consider the diversity of group members. Zheng Wei (2007) believes that participants in the community have their own expertise and should be able to help others.15 Therefore, the diverse abilities of group members can promote mutual learning between students and make up for their own shortcomings. When

conducting research and discussion, team members need to position different roles according to their respective abilities, and each perform their duties when the learning community achieves a common goal to promote the efficiency and quality of learning.

4.2. The Establishment of Common Goals Helps Promote Learning Motivation, Improve Learning Effectiveness, and the Sense of Belonging and Cohesion of the Community

The second is about the common goals. The members of the learning community improve their cognitive abilities and knowledge-building capabilities through negotiation and communication, thereby enhancing their ability to achieve common goals. (Li Zhihe, 2019) 16

In the questionnaire survey, it is found that students who can feel and recognize the role of common goals in promoting learning enthusiasm and clear learning goals and directions are more obvious in improving their knowledge and skills. At the same time, learning motivation is also affected by these two aspects. Therefore, in the process of achieving common goals, it is necessary to communicate, negotiate and reiterate to ensure the clarity of learning goals and consistency of direction, and always pay attention to the enthusiasm of participants.

In terms of time and learning management, classes and groups showed different results. In the class, clarifying the learning purpose and direction helps to improve the time and learning management ability, but there is no such result in the group. Combined with the actual situation of the survey respondents, the high participation and guiding role of the teachers in the class may help students better manage their learning, and the arrangements in the group are more free. However, frequent and multi-person interact require a lot of time, which may lead to the loss of learning efficiency. This may be the cause of the different results, and further research is needed to determine the specific cause.

The enhancement of sense of belonging and cohesion, and the mutual negotiation of members have a positive effect on improving the ability of students and peers to learn together. The realization of the common goal can improve the learning efficiency in the short term, and enhance the cooperative learning ability of the participants in the long term. But this study has obvious limitations. The research ignores the changes in the sense of belonging along with the different stages of community development. The subjects of the study are all students in the same class, and the participants may have an emotional basis. Therefore, the results of the study have no reference to the learning community with complex backgrounds.

4.3. Active and Efficient Interactive Communication Promote the Construction of A Learning Community

Finally, the interaction between learning communities is also an important way to effectively improve learning effectiveness. Research by Zhang Jianwei and others(2020) found that challenging learning tasks in online teaching can satisfy the individual's competency needs through interaction between teachers and students or students, and strengthen the internal drive for learning.17 In the cases selected in this study, whether it is a class or a group learning community, the interaction and results between community members are based on problems and tasks, which also provides explanation for the Significant correlation of interaction and learning motivation.

The motivation to build a learning community requires group members to actively participate in the discussion, express their own opinions, complement each other's strengths, and form an inclusive environment. According to the questionnaire survey, in the process of solving problems and tasks, team members sometimes dispute their opinions. As a miniature social organization, the learning community has conflicts (Liu Guangyu, 2009) 18, so this is a very normal phenomenon. In the final classroom report form, group members need to reach a consensus and respond to questions from other groups and teachers. Therefore, mutual

evaluation of content between members in advance has become an important preparation for some groups. Through mutual communication, assistance and brainstorming, the efficiency of problem solving will be greatly improved.

In the class learning community, the interaction between teachers and students pays more attention to the feedback and guidance ability of teachers as assistant scholars. The teacher's feedback does include not only the content of the course learning, but also the emotional identification and support. Especially in the virtual learning community environment, because it is different from the opposite form below the line, this emotional communication is to a large extent is ignored, but it has a certain effect on the improvement of students' motivation and enthusiasm for learning. The online environment during the epidemic has highlighted the individuality and individual needs of students, while the use of Internet technology has made teachers pay more attention to the individual situation and experience of each student. In the actual situation of the survey subjects, although different teachers adopt different forms in teaching interaction, they have all achieved certain results. For example, through the setting of task points on the learning platform, timely evaluation and feedback of each student's learning situation can be carried out. The lectures are recorded and broadcasted, while learning resources related to the course will also be shared to stimulate students' enthusiasm.

5. Conclusion

This study first summarizes and defines the relevant theories of virtual learning community through literature research. And the questionnaire based on three dimensions including institution, common goal and interactive communication makes it operational to measure and analyze. Finally, the study makes suggestions for the construction of the learning community that can be continued and extended to regular courses. This study has selected subjects that cover different majors however it is not enough that the sample size is small. In future research, more diverse courses and larger sample sizes can be chosen to ensure that the proposal is universal. There is also a lack of data on teachers' attitudes towards the learning community in this study. As important participants in the learning community, teachers deserve more in-depth research and discussion in the future. In addition, in the part of interactive communication, due to the limitation of researchers' capacity, it is difficult to conduct network analysis on the relationship between members of the community. In future studies, social network analysis tools (such as Ucinet) can be used to connect the respondents and conduct a more in-depth study on the interaction between members of the virtual learning community.

References

[1] Zhang Hongbo, Xu Fuyin. The construction of learning community and related factors analysis based on the perspective of social network[J]. Audio-visual Education Research, 2016, 37(10): 70-76.

[2] Jiang Qiang, Liu Hongyan, Zhao Wei. Building an "online learning community" to promote learners' autonomous learning [J]. Modern Educational Technology. 2008(1): 112-114.

[3] Zhao Ling. Research on College English Teaching Model Based on the Network Learning Community [J]. Open Education Research. 2010 (05): 72-76.

[4] Zhong Zhirong. Construction and application of network learning community based on QQ group[J]. China Audio-visual Education, 2011(08): 92-95.

[5] Cao Chuandong, Zhao Huaxin. A case study of social interaction in the MOOC course discussion area [J]. China Distance Education, 2016(03): 39-44.

[6] Kuang Shanyun. The construction of network learning community[J]. Open Education Research, 2005(04):33-35.

[7] Zhong Zhixian. Knowledge construction, learning community and the understanding of interactive concepts[J]. Audio-visual Education Research. 2005(11):20-24+29.

[8] Liu Wei, Sun Yuesheng. The role of teachers' guidance in the network learning community [J]. Contemporary Educational Science, 2003(17): 44-45.

[9] Li Zhihe, Zhou Nana, Qin Yifan, Li Ning. The construction of the activity mechanism of the hybrid learning community in the network learning space[J]. China Audio-visual Education, 2019(09): 104-111.

[10] Tong Hui, Yang Yanjun. Research on collaborative knowledge construction community in blended learning [J]. Modern Distance Education, 2016(02):56-62.

[11] Chunmei Zhao, George D. Kuh. Adding value: Learning communities and student engagement[J]. Research in Higher Education,2004,45(2):115-138.

[12] Stefanou, C.R., Salisbury-Glennon, J.D. Developing Motivation and Cognitive Learning Strategies Through an Undergraduate Learning Community[J]. Learning Environments Research ,2002,5: 77-97.

[13] Andreoni J, Harbaugh WT, Vesterlund L (2003) The carrot or the stick: rewards, punishments and cooperation. Am Econ Rev 93:893–902

[14] Chowdhury, T.G., Wallin-Miller, K.G., Rear, A.A. et al. Sex differences in reward- and punishment-guided actions. Cogn Affect Behav Neurosci 19, 1404–1417 (2019).

[15] Zheng Wei, Li Mang. Learning community and its formation [J]. Global Education Outlook, 2007(04): 57-62.

[16] Li Zhihe; Zhou Nana; Qin Yifan; Li Ning. The construction of the activity mechanism of the hybrid learning community in the online learning space. China Audio-visual Education, 2019(9): 104-111.

[17] Zhang Jianwei, Zhou Yufan, Xuan Xingyu, Hua Weijun, Li Haihong. Online teaching and student development in colleges and universities during the epidemic prevention and control period: a case study based on University B [J]. China Higher Education Research, 2020(06): 64-71.

[18] Liu Guangyu, Shao Jiaming, Dong Zhenjuan. Construction of Classroom Learning Community[J]. Chinese Journal of Education, 2009(04): 65-67.