Evaluation on College Live Teaching during COVID-19 Based on CoI

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Abstract: In order to improve college live teaching, this study collected 405 questionnaires on line and analyzed the learning experience of college students based on community of inquiry by SPSS 26. The findings are: there is positive correlation between the frequencies and the level of three presences; teaching presence and social presence can predict 75.3% of cognitive presence; the overall effects of live teaching during COVID 19 period are ordinary, especially on the direct instruction of teaching presence, emotional expression of social presence and resolution stage of cognitive presence.

Keywords: live teaching, teaching presence, social presence, cognitive presence, COVID-19

1 Introduction

Under the influence of the COVID-19, live teaching has become the primary choice for many schools and teachers to carry out teaching[1]. The live teaching in this study refers to a real-time synchronous teaching form, which is assisted by the live platform and consists of teachers, students, live teaching environment and teaching resources. It has five characteristics: real-time, multi temporal, interactive, on-the-spot and participatory[2]. However, with the rapid development of live teaching, problems are gradually emerging, such as most learners' learning experience and effect are not ideal, and learning is mostly in a state of mediocre or chaotic results[3]. The epidemic situation is changeable. It's essential to evaluate the learning effects of the living teaching to support the solid operation of education system.

2 Community of Inquiry

The theoretical framework of Community of Inquiry (CoI) is a dynamic online learning and hybrid learning model created by Canadian scholars D.R. Garrison and Terry Anderson. This framework is based on Dewey's work *Community and Inquiry* and its critical reflection theory, extends it to online learning and mixed learning, and further condenses the elements of inquiry community into teaching presence, social presence and cognitive presence [4].This study collected and analyzed data related to live teaching based on the inquiry community scale, and answer the following questions:

First, does the level of teaching presence, social presence and cognitive presence change with gender, grade, major and attendance frequency?

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Second, what is the relationship among social presence, teaching presence and cognitive presence in the live teaching during the epidemic?

Third, how are college students' learning experience in the live teaching during the epidemic?

3 Methods

3.1 Participants

The participants are undergraduate and postgraduate students who participated in live broadcast teaching in Huanggang Normal University during the epidemic. Students from freshman to third year of master were selected, covering 11 major types. The proportion of men is 37%, and the proportion of women is 63%. The participants were 26.2% sophomores, 27.7% juniors and 24.9% seniors, indicating that most of the participants were sophomores to seniors.

3.2 Tool

The scale used in this study is based on the Chinese version of the Inquiry Community Scale compiled by Lan Guoshuai [5]. In combination with the information obtained from the interview, the wording of questions 12 and 33 is appropriately modified. The mapping between the CoI and the items of the scale is shown in Figure 1.

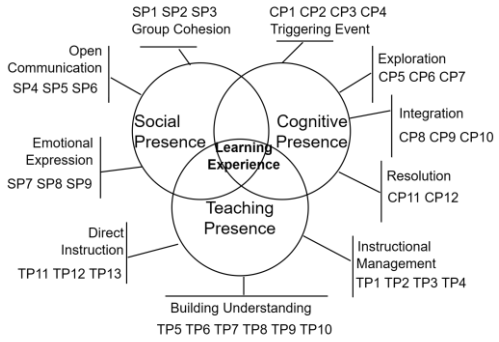

Figure 1. Mapping between the CoI and items

4 Data Collection

A total of 449 questionnaires were distributed online, and 405 valid ones were finally obtained, with an effective rate of 90%. The standardized Cronbach coefficient of the questionnaire was 0.948, and the KMO test coefficient was 0.959, indicating that the reliability and validity of the questionnaire were good. SPSS26 was used for data analysis, including independent sample T test, analysis of variance, correlation analysis, regression analysis and descriptive statistical analysis.

5 Results

5.1 The relationship between different variables and three kinds of presence

The results of independent sample T test and ANOVA showed that the three kinds of presence would not change with the change of gender, grade and major. According to the data analysis, among the three dimensions of inquiry community, the significant result of class attendance frequency of teaching presence, social presence and cognitive presence is 0, and there are significant differences. It can be seen from multiple comparisons (Cognitive Presence: 3>2,4>3, 4>2,5>2; Teaching Presence: 3>2,4>3,4>2,5>2; Social Presence: 4>2,4>3) that the higher the frequency of students' participation in live teaching, the higher the level of experience of the three kinds of presence.

Therefore, college teachers can redesign offline curriculum as learning centered flipped classroom. On the one hand, it ensures the consistency of the teaching mode, flexibly responds to the impact of repeated epidemics on the teaching mode, minimizes the impact of epidemics or other emergencies on the teaching effect, and on the other hand, it meets the learning characteristics of college students.

5.2 Relationship among social presence, teaching presence and cognitive presence

To answer the second research question, correlation analysis and regression analysis were conducted. Each variable has a significant correlation at the 99% significance level, and the correlation coefficient is greater than 0, so it is a positive correlation. For example, the correlation coefficient between teaching presence and social presence is 0.848, which is a positive correlation. By analogy, the correlation between all other variables can be explained.

The residuals between teaching presence and cognitive presence conform to the normal distribution and meet the premise requirements of the linear model, indicating that regression analysis can be conducted. Therefore, using cognitive presence as the dependent variable and teaching presence and social presence as the predictive variables, the regression analysis shows that the R square value is 0.753, and teaching presence and social presence can explain 75.3% of cognitive presence. What’s more, teaching presence and social presence have a positive impact on cognitive presence. The influence coefficient is 0.344 and 0.543 respectively.

The data results verify Garrison's proposition that social presence is the support of cognitive presence, which can indirectly regulate the formation of critical thinking of inquiry community learners. Teaching presence is an effective means to strengthen the level of cognitive presence.

5.3 Learning experience

To answer the third research question, the study used the mean and standard deviation analysis in descriptive statistical analysis. The learning experience in teaching, social presence and cognitive presence was 3.97, 3.92 and 3.98.

In teaching presence, the mean of "instructional management" is the highest, indicating that teachers clearly convey important curriculum themes, objectives, activity dates and time arrangements, and provide clear guidance for learners to participate in activities. "Direct instruction" is slightly lower than the other two elements, and its corresponding items are TP11, TP12 and TP13, of which the mean of TP13 is the lowest. This is mostly due to teachers'

teaching style and experience.

On the dimension of social presence, the mean of emotional expression, open communication and group cohesion are all below 4, indicating that students did not get enough sense of social presence in live teaching during the epidemic. The mean of emotional expression is the lowest, which shows that compared with open communication and group cohesion, learners do not have enough time and opportunities to express their feelings. Among the items corresponding to the emotion expression dimension, the mean of SP1 is lower than the total mean of this dimension, which indicates that learners have not had the opportunity to fully interact with other learners in live teaching to gain a sense of belonging.

The mean of the cognitive presence dimension is higher than the other two dimensions, which shows that college students can grasp the important knowledge points in teaching to explore and integrate knowledge. However, the mean of the "solution" stage is the lowest among the four stages, which also confirms the view put forward by Vaughan and Garrison[4] that students face difficulties in the transition from the integration stage to the solution stage. The mean of CP11 in the items corresponding to the solution stage is lower than the mean of the stage. The reason why students cannot propose and apply solutions is that on the one hand, students' problem solving and application abilities need to be improved, and on the other hand, instructional design problems.

In terms of specific improvement measures for college live teaching, this study puts forward three suggestions:

First, integrate effective interaction.

In the live teaching scene with space separation, the lack of appropriate interaction, such as direct instruction and emotional expression, will not be conducive to the link between students and the inquiry community, and cannot create a trusted learning environment for effective learning. Mutual trust is the foundation of social presence, and also lays the foundation for the formation of the awareness of inquiry community.

Second, Integrate synchronous and asynchronous learning resources.

Synchronous and asynchronous teaching resources or tools are suitable for different types of learning activities and can complement each other in a timely and effective manner. Although asynchronous dialogue and communication are not as interactive as synchronous classroom, it is very conducive to deep thinking, because learners have enough time to reflect, explore and integrate. Also, teachers can clearly express the purpose and content of the activity in class, and leave the cooperative discussion part of the activity and the tasks that need to be integrated and applied after class, so that teachers can reserve interaction time and give students sufficient direct instruction.

Third, improve the instructional design.

In order to promote the college students' critical thinking, college live teaching should take learners and learning resources as a part of the learning environment at the beginning of the design, and make overall planning to maximize the advantages of resources and tools, so that learners can experience better teaching, social and cognitive presence, and finally integrate into the learning of the inquiry community.

6 Summary

This research deeply analyzes the influencing factors of live teaching and the learning experience of college students, and puts forward relevant suggestions. However, there are still some aspects to be further studied: First, expand the number and diversity of samples. The sample of this study is mostly female. In order to increase the representativeness and applicability of the data, the types of universities should be expanded to control the proportion of men and women. Qualitative research should be carried out according to the results of descriptive statistical analysis, to further understand students' ideas in the stages of "direct instruction", "emotional expression" and "problem solving", to deeply explore the specific reasons for the low mean, to improve the research and analysis results, and to fully reveal college students' learning experience in live teaching.

Project source

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Reference

[1] Liang Linmei, Cai Jiandong, Geng Qianqian. Online Teaching in Primary and Secondary Schools under the Epidemic: Reality, Improvement Strategy and Future Reconstruction: Analysis from Learning Perspective [J]. e-Education Research, 2020, 41(05):5-11.

[2] Wang Yunwu, Wang Yuru, Hong Li, Chen Yiwen. Live Teaching in the 5G Era: Innovating the Form of Online Education [J]. Modern Distance Education Research, 2021,7(04):12-19.

[3] LAURENC, ALVAREZ-XOCHIUAO,EDWARDS C.Learning in web 2.0 environments: surface learning and chaos or deep learning and self-regulation[J].Quarterly review of distance education, 2011, 12 (1): 1-21.

[4] Garrison, D. Randy, Terry Anderson, and Walter Archer. Critical inquiry in a text-based environment: Computer conferencing in higher education. [J] The internet and higher education 2.2-3 (1999): 87-105.

[5] Lan Guoshuai, Zhong Qiuju, Lv Caijie, Song Yating Wei Jiacai. Construction of a Chinese Version of the Community of Inquiry Measurement Instrument [J]. Open Education Research,2018,24(03):68-76.

[6] Vaughan, N., & Garrison, D. R.. Creating Cognitive Presence in A Blended Faculty Development Community [J]. The Internet and Higher Education, 2005, 8 (2): 1~12.