Existing Problems of Chinese Virtual Learning Environment in Higher Education in Man-Machine-Environment System

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Abstract. The research is to 1) find out specific the existing problems of man-machine-environment system, the Chinese virtual learning environment in higher education, 2) identify the students' concerns and preferences for taking online courses and rebuild the model of Chinese virtual learning environment between the instructors and learners based on the communication theories 3) provide some possible suggestions for developing virtual learning environment in China. Through mathematical methods, the rationality of data is checked and the weights of the indexes are determined.

1. Introduction

The rapid development in science and technology makes the world become a close link. In addition, the booming development of the economy and the world refresh people's opinion on education and life-long-education gradually becomes the pursuit of modern society. As a result, virtual-leaning has now experienced a breaking increase in the China. Virtual-learning environment begins relatively late in China but currently has gone into a booming status. The platform of virtual-learning for college students in China is roughly classified into the two categories based on the developer. There are kinds of online video courses on the platform uploaded from universities in our country, such as Tsinghua University, Peking University, Zhejiang University, Fudan University and other 985 or 211 universities. The second kind is designed with business purposes by education training commercial bodies, for example, New Oriental, HuJiang. They are popular among young learners and their parents. Totally, size for online user in our country is getting bigger and bigger gradually, which reflects that demand for virtual-leaning is increasingly urgent.

In this way, Chinese government, Universities and even private companies intend to seize the opportunity of the information era to strengthen the Chinese education. However, from college students' perspective, there might be several existing problems of the quality and the communication medium of these online courses. Firstly, the developing technology for virtual leaning in our country is not as advanced as the western countries. Until now, China has not developed a stable system, which has clear course sections, easy-operation interface and convenient handle. Also, active user who keeps a frequency click on the course has not delivered a satisfactory performance. In other words, the learners have inadequate interests of the online courses and they are easily become bored within the process of virtual learning. In addition, the platform of virtual learning is over a single pass and cannot meet the needs of college students that the video courses still the mainstream type of virtual learning productions.

2. **Research Methods:**

2.1. Literature Review
Collecting the current researches and data of the Chinese online education industry to find out the current issues, existing problems and possible improvements of the Chinese virtual learning environment theoretically.

2.2. Quantitative research and Data analysis
For college students are the receivers and learners in this virtual learning environment, their feedbacks and concerns are significant for the outcome and the quality of this system. The author intends to design a questionnaire to find out the detailed and specific concerns of college students. Through the chi-square analysis, the author intends to identify the similarities and differences of the various college students in order to find out the possible suggestions of the improvements of Chinese virtual learning environment.

2.3. Modelling
Based on the current data and researches, the author intends to model both the existing Chinese virtual learning environment and the possible reconstructed system of it. It aims to visualize the abstract concept and outcome of this issue.

3. Literature Review
For the aim of this research is to identify the existing problems and providing some possible suggestions based on students' perspectives, the author needs some secondary reliable big data from Chinese National Bureau of Statistics and other researches to acquire the general information of Chinese virtual learning environment and to find out the general issues and problems from both students and instructors' perspectives in order to make the students' survey become more targeting.

3.1. Major Goals
The Chinese big data shows that in the survey of online education and training subdividing demand of Internet users, higher education and vocational training are connected nearly half (44.9 % and 44.6 %) ranked first and second [1]. The current higher education and vocational training education demand is high for college students in China.

3.2. Major Problems of Chinese Online Courses
Due to the data from Chinese National Bureau of Statistics, it shows that 43.2 % of users have a inattention problem in the use of online Education users, and 34.7 % of the users still have the problem of low interest in learning, the others are too dependent on online education products, no classroom atmosphere, unable to complete the curriculum plan, the curriculum unreasonable [1].

4. Quantitative research
University students' concerns, as the receivers and users of the Chinese virtual learning environment, determine the effectiveness and usefulness of the development of the online courses. In order to obtain more specific and detailed concerns for college students, the author conducts a survey, which mainly disseminated the questionnaires in Beijing universities, such as China Agricultural University, Peking University and University of Science & Technology of Beijing. These samples are randomly picked in these universities.

4.1. Reliability
To make sure the collected data is amenable and reliable, the author has done a reliability test after we got the data. Reliability test estimated the consistency and stability of a sample. In this study, we use Cronbach's Alpha for the standard. The higher value of Cronbach's Alpha means higher reliability of

the scale. To affirm the data set is reliable, the Cronbach's Alpha of a scale needs to be greater or equal to 0.6, and if the Cronbach's Alpha is greater than 0.8, this experiment will be regarded as ideal. The Cronbach's Alpha is 0.815 for this survey.

4.2. A survey on deficiencies of online education

This section is an analysis of deficiencies of online education, including reasons that samples drop online courses, deficiencies of online education platforms and concerns over online courses and issues regarding online study activities (table 1).

Table 1. Analysis of deficiencies of online education

Questions	Category	Frequency	Percent(%)
The possible reason that you have given up Online learning	Choosing course carelessly and choose some courses that not interested in	17	6.4
	Be Busy in other things, have no time in class	100	37.9
	Difficult courses, can't keep up with he teacher	22	8.3
	Long course time, without patience to listen to teachers	75	28.4
	Too expensive	15	5.7
	Never give up	35	13.3
What are the shortcomings of the online education platform from your perspective?	Large amount of other information access and difficult to be focused	35	13.3
	Knowledge is sometimes difficult to understand	65	24.6
	No classroom atmosphere, lack of communication with the instructors	135	51.1
	Slow downloading and low quality	18	6.8
	Other	11	4.2
In online learning, what do you worry about?	Problems encountered in learning cannot be resolved immediately	170	64.4
	Lack of learning resources	50	18.9
	Network speed is too slow	33	12.5
	Network technology issues	11	4.2
	Total	264	100.0

It can be known from the above chart: regarding reasons for dropping, most samples cite "too busy to keep up with course progress" and "course duration exceeds limits of patience". In terms of deficiencies of online platforms, 51.1% samples choose lack of classroom atmosphere and interaction. And 64.4% samples cite failure to address questions over operations as their biggest concern.

As for factors leading to drops of attention level during studies, Lack of interactions with teachers; The resources online are complex, in particular, there are many disturbing website; Online learning resources are not comprehensive and the form is rigid are the three most popular options are all chosen more 40% of the time, namely 62.9%, 59.1% and 47.7% respectively, which means lack of interaction, chaotic learning sources and out-of-date and rigid learning materials all lead to shorter attention span (table 2).

Table 2. What do you think are the problems in the process of online learning that lead to inattention?

Items	Frequency	Percent%
Lack of interactions with teachers	166	62.9
The resources online are complex, in particular, there are many disturbing website, which makes the students are influenced and some of them may be indicated.	156	59.1

Online learning resources are not comprehensive and the form is rigid	126	47.7
The speed of instructor's teaching is too fast and the thoughts are often interrupted	85	32.2
When students meet with difficulties in learning, the study ethics would be reduced	80	30.3

Table 3. Chi-Square analysis on the shortcomings of Chinese online education among different grades

Ques-tions	Category	Grade					Total	X^2	P
		Freshman	Sophomore	Junior	Senior	Post-graduate			
Q1:	Q1-OptionA:	2(5.0)	3(5.5)	7(9.7)	2(3.8)	3(6.7)	17(6.4)	17.902	0.594
	Q1-OptionB:	16(40.0)	16(29.1)	27(37.5)	24(46.2)	17(37.8)	100(37.9)		
	Q1-OptionC:	1(2.5)	4(7.3)	10(13.9)	5(9.6)	2(4.4)	22(8.3)		
	Q1-OptionD:	13(32.5)	18(32.7)	17(23.6)	16(30.8)	11(24.4)	75(28.4)		
	Q1-OptionE:	3(7.5)	5(9.1)	2(2.8)	2(3.8)	3(6.7)	15(5.7)		
	Q1-OptionF:	5(12.5)	9(16.4)	9(12.5)	3(5.8)	9(20.0)	35(13.3)		
	Total	40(100.0)	55(100.0)	72(100.0)	52(100.0)	45(100.0)	264(100.0)		
Q2:	Q2- OptionA:	4(10.0)	12(21.8)	5(6.9)	8(15.4)	6(13.3)	35(13.3)	49.297 **	0.000
	Q2-OptionB:	4(10.0)	15(27.3)	26(36.1)	15(28.8)	5(11.1)	65(24.6)		
	Q2-OptionC:	27(67.5)	24(43.6)	35(48.6)	19(36.5)	30(66.7)	135(51.1)		
	Q2-OptionD:	0(0.0)	3(5.5)	3(4.2)	10(19.2)	2(4.4)	18(6.8)		
	Other	5(12.5)	1(1.8)	3(4.2)	0(0.0)	2(4.4)	11(4.2)		
	Total	40(100.0)	55(100.0)	72(100.0)	52(100.0)	45(100.0)	264(100.0)		
Q3:	Q3-OptionA:	31(77.5)	38(69.1)	40(55.6)	25(48.1)	36(80.0)	170(64.4)	35.674 **	0.000
	Q3- OptionB:	4(10.0)	10(18.2)	19(26.4)	12(23.1)	5(11.1)	50(18.9)		
	Q3-OptionC:	0(0.0)	5(9.1)	10(13.9)	14(26.9)	4(8.9)	33(12.5)		
	Q3-OptionD:	5(12.5)	2(3.6)	3(4.2)	1(1.9)	0(0.0)	11(4.2)		
	Total	40(100.0)	55(100.0)	72(100.0)	52(100.0)	45(100.0)	264(100.0)		

* $p<0.05$ ** $p<0.01$

5. Data Analysis

The chi-squared test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories. Through the chi-square analysis, the author intends to identify the similarities and differences of the various college students

in order to find out the possible suggestions of the improvements of Chinese virtual learning environment (table 3).

5.1. Chi-Square analysis on the shortcomings of Chinese online education among different grades
It can be known from the table 3: Q2: "What are the shortcomings of the online education platform from your perspective?" and Q3: "In online learning, what do you worry about?" These two items display significance. After comparing differences, it can be concluded that in terms of online platform deficiencies, groups of freshmen and postgraduates are more likely to point out lack of communication in classroom scenarios, whereas sophomores, juniors and seniors tend to blame rigid knowledge for making it hard to understand. As for concerns about online study, freshmen and postgraduates are more inclined to conclude technical issues cannot be solve immediately, whereas sophomores, juniors and seniors tend to worry more about limited supply of study materials.

5.2. Chi-Square analysis on the shortcomings of Chinese online education among different majors

Table 4. Chi-Square analysis on the shortcomings of Chinese online education among different majors

Questions	Category	Major			Total	X^2	P
		Art	Science	Engineering			
	Q1-Option A:	12(6.3)	5(11.9)	0(0.0)	17(6.4)		
	Q1-Option B:	70(36.5)	17(40.5)	13(43.3)	100(37.9)		
Q1:	Q1-Option C:	20(10.4)	0(0.0)	2(6.7)	22(8.3)		
						10.353	0.410
	Q1-Option D:	54(28.1)	12(28.6)	9(30.0)	75(28.4)		
	Q1-Option E:	12(6.3)	1(2.4)	2(6.7)	15(5.7)		
	Q1-Option F:	24(12.5)	7(16.7)	4(13.3)	35(13.3)		
	Total	192(100.0)	42(100.0)	30(100.0)	264(100.0)		
	Q2- Option A:	25(13.0)	5(11.9)	5(16.7)	35(13.3)		
	Q2- Option B:	47(24.5)	13(31.0)	5(16.7)	65(24.6)		
Q2:	Q2- Option C:	98(51.0)	21(50.0)	16(53.3)	135(51.1)		
						3.928	0.864
	Q2- Option D:	15(7.8)	1(2.4)	2(6.7)	18(6.8)		
	Other	7(3.6)	2(4.8)	2(6.7)	11(4.2)		
	Total	192(100.0)	42(100.0)	30(100.0)	264(100.0)		
Q3	Q3-Option A:	122(63.5)	29(69.0)	19(63.3)	170(64.4)		
						3.644	0.725
	Q3-Option B:	37(19.3)	7(16.7)	6(20.0)	50(18.9)		

Q3-Option C:	27(14.1)	3(7.1)	3(10.0)	33(12.5)
Q3-Option D:	6(3.1)	3(7.1)	2(6.7)	11(4.2)
Total	192(100.0)	42(100.0)	30(100.0)	264(100.0)

* p<0.05 ** p<0.01

The Chi-Square analysis is to test the different professional sample groups. Their differences in the online education among different majors are all higher than 0.05, and the *Ps* are all higher than 0.05, that is to say, all of them showed no manifest differences, that is, the group samples among different majors, they all show the consistency (table 4).

6. Discussion

6.1. On manifest differences among college student in different grades
The Chi-Square analysis only shows two major differences among different college students in various grades that groups of freshmen and postgraduates are more likely to point out lack of communication in classroom scenarios, whereas sophomores, juniors and seniors tend to blame rigid knowledge for making it hard to understand. The possible interpretation of this difference could be, for freshmen and the postgraduates, they are new students in certain academic environment they might need more communications within classroom scenarios and meet with more new classmates.

The possible solution of this issue is to add some social functions in this virtual learning environment. The idea of integration of multiple media could solve this issue for freshmen, which means building a learning community of multiple media with mutual recognitions [2]. The aggregated and integrated application of media, which means that in a learning community, the completion of learning needs to rely on the polymerized use of Internet media and mobile Internet media. For example, a user's ID can be used to log in to the online education website on the Internet and can also be used to log in APP on the mobile Internet media. It is also possible to be registered and mutual recognized on other related applications of mobile Internet media, such as WeChat, QQ, Yixin, Momo, etc. The advantage of this approach is to promote the interactions among the learners and build a sense of classroom virtually. Once people have an identity in relevant applications, other applications will also be followed up in real time, which means students are easier to communicate with each other.

Another major difference is that freshmen and postgraduates are more inclined to conclude technical issues cannot be solve immediately. It is understandable for the freshmen and postgraduates that they are new people and not familiar with the access system of this virtual learning environment. The possible solution of this issue is to provide a more detailed introduction of the new students with in the campus. Also, the access to the online education could be simplified and the developers need to provide a more stable and advances access system.

6.2. On the consistency of existing problems of Chinese virtual learning environment
The group samples among different majors, they all show the consistency of existing problems. In other words, the almost every student in different majors tends to complain among the same issues of Chinese virtual learning environment. The common issue for all college students is lack of the interest in the virtual learning environment. For one thing, they think it is very difficult to contact with the online instructors if they have some problems. For another, they blame that chaotic learning sources and out-of-date and rigid learning materials. The current online education only digitizes traditional teaching, replaces the traditional learners listen to teachers' explanations on-site by means of video recording and methods of online viewing.
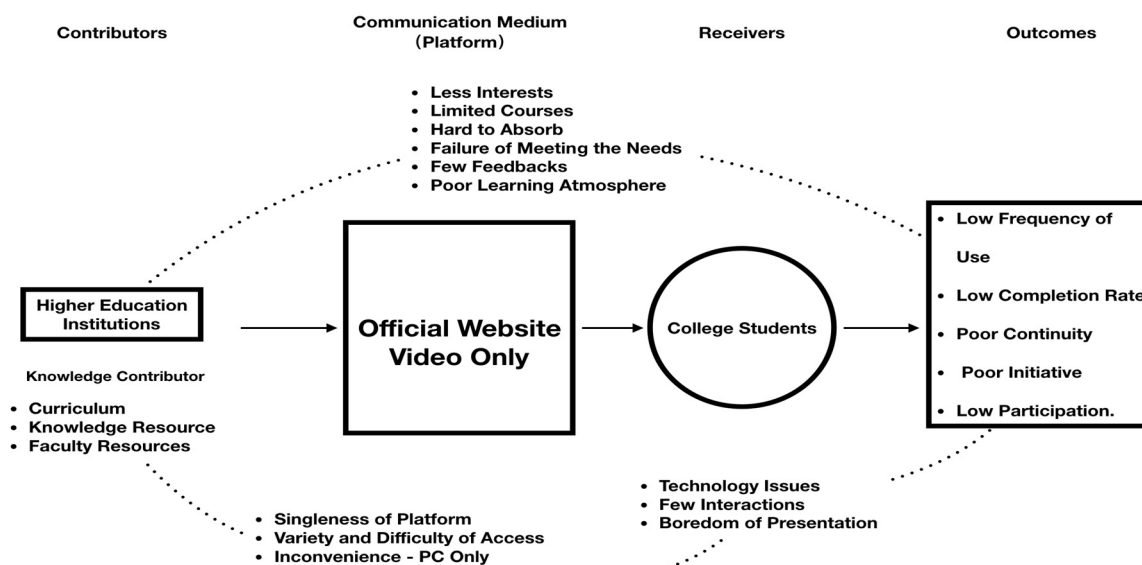
Figure 1. Model of Existing Problems of Chinese Virtual Learning Environment

This model shows the existing problem of Chinese virtual learning environment. The video only method of current system is only a one-way communication model that the students are only the receivers in this communication and education system. They only receive the video from the instructors, who are the knowledge contributors in this system and it does not reflect the essence of "Internet Plus", nor the extension of Internet thinking [3]. When students face some difficulties in this learning process, they have no channels to contact with their teachers. Also, only receiving the videos are boring process for students to learn, which causes the complaint of college students. In addition, there are always others minor problems such as difficulty of access, PC only inconvenience and limited learning resources, which cause the students determine to quit this virtual learning environment. Therefore, the users can't obtain a sense of pleasure and satisfaction in the learning process, and thus gradually loses their interest of using it.

The real online education should take user needs as the basis of design, maximizing the openness and simplicity of the Internet, and even featured with pursuing of extreme experience [4]. However, the reality is the transmission pattern of advanced online education is relatively single. The version design and function arrangement of each major online website tend to be consistent and the spread content is dull and boring. The content it spreads is not only small in quantity, but also almost lack complementary products and services. In this way, the Chinese virtual learning environment should add the Internet attributes in the structure chart of advanced online education transmission system, which not only satisfies the individual requirements but also realizes the purpose of teaching goes together with pleasure.

The possible solution of this issue might be the gamification progress of online education and dramatic field of view in the Chinese virtual learning environment. The setting of gamification progress content is to strengthen the entertainment and dramatization of online study, and to stimulate the user's interest in learning through games [6]. Games are the original impulses of mankind. The pursuit and love of entertainment and dramatization are objective fact, which is also a method that can be well utilized. Knowledge learning is a more serious internalization process. In traditional courses, teachers often set game sessions to make it easier for students to understand knowledge points, relax nervous nerves, relieve the depressing atmosphere, and get better results in teaching. Online education is to complete individualized teaching in a virtual environment. If we embark on the old path of behaviorism again, learners will experience mental fatigue due to factors such as self-control or teaching content. However, accepting the concept of games in traditional education, setting up interactive game sessions, recording learning progress, generating indirect network effects in a

dramatic way and promoting follow-up learning, which will inevitably push online education to a new development field of vision.

7. Conclusion

Based on above analysis, the integration of higher education has become a trend in China, however, from the college students' perspective the Chinese virtual learning environment still contains several problem. And the existing problems show both differences and contingency among different students. The possible solutions would be cross-media and gamification, which aim to increase the cohesion and the interests of learners. On the basis of media connection and gamification, the virtual learning outcomes would appear collaboratively progresses in several levels including information access, virtual learning atmosphere, attitudes and behaviors.

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