ANALYSIS OF INFLUENCING FACTORS OF BLACKBOARD TEACHING EFFECT BASED ON ISM MODEL

Zaohong Zhou

School of Tourism and Urban Managem ent, Jiangxi University of Finance & Economics, Nanchang, 330032, China.

Email: zhouzh5652@163.com

ABSTRACT

Network Teaching is more and more brought to the attention of education of workers at home and abroad. Blackboard is a commonly used network teaching platform. It's beneficial to help teachers achieve the objectives of the communication with students and teaching evaluation. In order to promote the use of Blackboard platform, enhance the teaching effect, it's necessary for us to explore the factors affecting the impact, to find out the influencing factors of network teaching and its structure. Using the Interpretative Structural Model(ISM), this paper has carried on the normative analysis to the affecting of the network teaching, to identify influence the relationship between the network teachings. And promote the development of network teaching.

Keywords: Network teaching, Influencing Factors, ISM, Blackboard.

1. INTRODUCTION

During the past decade there has been an exponential growth in the use of information and communication technology (ICT) which has made pervasive impacts both on society and on our daily lives [1] Information and communication technologies are changing the teaching and learning process around the world [2]. Online learning has become another important format for course delivery in higher education [3]. According to a survey conducted by Allen and Seaman [4] at over 2,500 institutions of higher education in the US, 4.6 million students took at least one online course during fall 2008 [5]. The number of students enrolled in an online course has grown rapidly over the last decade, so increasing numbers of students will take an online course during the next decade. Long-distance real-time of modern education, and the advantages of resource sharing, has been gradually broke the limitation of traditional teaching in space and time, as a kind of relying on the professional new mode of network teaching platform. Network teaching as a new kind of network teaching form of Distance Education, because of its widely used in various field of Education, more and more get the attention of the scholars at home and abroad [6].Blackboard Teaching Management Platform(BB)is a Network Teaching Platform, which was used to virtual learning environment to strengthen the supplement of classroom Teaching and provide remote Teaching Platform [7].Blackboard Teaching Management Platform has a strong core functions, it can make effective management courses so teachers can set the content, generating operation and strengthening cooperation, to assist schools with an important goal of teaching, communication and evaluation about[8].The interface of platform is simple and unified, easy to operate, the teachers can easily create courses, add the course content,

create discussion boards and a series of operations [9].Doing this greatly reduced the difficulty of the teachers to use this platform to expand the scope of use of this platform [10],to facilitate teachers to create a variety of course [11] for students studying at the university of course [12].

But, the network teaching, as a kind of teaching form, is also a modern information technology, student's willingness to accept, may affect the network adopt and effect. On the other hand, due to the differences between different people's cognitive characteristics, can also cause people to have different cognition on the same thing. The students' cognitive will no doubt affect the student to the network teaching willingness to adopt/continue to use this will also affect the effect of network teaching. Therefore, it is particularly important to study the influencing factors of effect of network teaching.

2. LITERATURE REVIEW AND DETERMINE THE INFLUENCING FACTORS OF NETWORK TEACHING

2.1. Literature Review

At present, there have been some scholars in view of the network teaching effect influence factors were studied. Thomas based on students' cognitive behavior in view of the network teaching effect influence factors are studied, focusing on significant difference on students' performance [13]. Chao - Min Chiu study of the use of online learning, for online learning service provider provides advice [14], Hamburg [15], Petrides [16] and others for online learning adoption and continued use influence factors are studied,

Ong, Mahmod Sadde and Bahli confirmed and online learning and significant impact on relations between the network teaching system using behavior [17], Wen-zhi Wang presents the principle of multimedia teaching are discussed in this paper, the present teaching related research was summarized and combing, and gives the corresponding application Suggestions [18]. These studies because each scholar's point of view is different, the conclusion also has the very big difference.

2.2 Determine the influencing factors of network teaching

1. In order to scientifically set factors affecting B1ackboard network teaching platform, before the formal research, this study from the 128 study documents compiled 20 factors, which affect the network teaching. In order to verify the consensus degree of these factors, this research uses the variation Coefficient of Variance (Coefficient of Variance, CV) factor to represent the consensus.

2. Coefficient of Variation CV = (The standard deviation /average) x 100%

3. Generally, Coefficient of Variation (CV) of threshold value Ɛ for 0. 3, as long as the CV value is greater than the Ɛ value, it indicates that the factor has reached consensus on [19].

4. In this study, the questionnaire survey to the 20 factors are selected 90 network teaching staff, the importance of each factor score according to 10 scale division. The survey, a total of 85 questionnaires taken back.

After recycling questionnaire, this study calculated degree experts agree that a group of projects of various factors of the mean, standard deviation and Coefficient of Variation (CV), in order to understand the formation of the expert group to study various factors meet the degree of difference. The results shown in the table below:

Table 1. Network teaching factors influencing degree of difference

Number	Factor	N	Standard Deviation	Standard Deviation	Coefficient of Variation (CV)	Keep or Not
1	Students' gender	85	4.642	1.867	0.091	N
2	Students' age	85	4.839	2.526	0.355	Y
3	Students' network level	85	4.002	2.18	0.434	Y
4	Students of online learning	85	4.875	2.123	0.317	Y
5	The social environment of the school	85	3.887	3.396	0.091	N
6	Students in the course of time	85	5.955	2.773	0.327	Y
7	The students' interest in learning	85	7.104	1.439	0.735	Y
8	The student to the curriculum utility value	85	6.278	1.359	0.087	N
9	Students learning tools using ability	85	6.38	1.358	0.748	Y
10	Students team cooperation ability	85	2.328	2.971	0. 292	Y/N
11	Network function	85	3.883	3.582	0.652	Y
12	The use of teachers remote education level	85	4.741	1.891	0.944	Y
13	Teachers' network and multimedia technology	85	3.077	2.799	0.65	Y
14	Teachers' professional quality	85	5.185	2.627	0.657	Y
15	Teachers' teaching enthusiasm	85	5.497	2.565	0.871	Y
16	The teachers' teaching way	85	6.43	2.963	0.587	Y
17	The intrinsic value of the course	85	6.101	1.22	0.496	Y
18	Capturing value	85	5.455	1.222	0.848	Y
19	Teaching of the course	85	6.971	1.348	0.889	Y
20	And the connection degree of other courses	85	7.845	1.057	0. 211	N

The Table 1 shows that have reached consensus on the consistency (CV > 0.3) the result of the 15, for "students' team cooperation ability" this factor, although the CV is only 0.292, considering the real work, a factor for network teaching effect does have a lot to do, so also included in the reserve list, and for other factors, are not retained.

Through the above analysis, finally summarizes the 16 variables affecting the effects of network teaching, notes for S_i (i= 1, 2,..., 16), respectively, S1: student age; S2: the standard of network; S3: students' network learning intention; S4: students in the course of time; S5: students' interest in learning; S6: student learning tools using ability; S7: student team cooperation ability; S8: network function; The use of the integrated: teachers remote education level; S10: teachers' network and multimedia technology; S11: teachers professional quality; S12: teachers' teaching enthusiasm; / S13: teachers' teaching methods; S14: the intrinsic value of the course; S15: course acquisition value; S16: teaching expectations. Due to the influence factors is more, the level of the relationship between them from the intuitive point of view is not clear, cross each other, some factors, some interrelated, and some showed the factors the influence on other factors, these factors lead to very complex formed between hierarchical factor chain, to the analysis of the structure.

3. BASED ON THE ISM MODEL OF NETWORK TEACHING EFFECT INFLUENCE FACTOR STRUCTURE ANALYSIS

3.1 The influence of the uncertainty

Through the above research shows that the variables that affect the effect of network teaching are 16, notes for S_i (i= 1, 2, 16), in accordance with the following method to establish direct binary relation between factors, namely the adjacency matrix A.

$A=$

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S_{10}	S_{11}	S_{12}	S_{13}	S_{14}	S_{15}	S_{16}
S_1	0	1	1	1	1	1	0	0	0	0	0	0	1	0	1	1
S_2	0	0	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_3	0	1	0	1	1	1	1	1	1	1	0	1	1	0	1	1
S_4	0	1	1	0	1	1	1	0	0	1	0	1	1	1	1	1
S_5	0	1	1	1	0	1	1	0	1	1	0	1	1	1	1	1
S_6	0	1	1	1	0	0	1	0	1	1	0	1	1	0	1	1
S_7	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1
S_8	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
S_9	0	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1
S_{10}	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
S_{11}	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1
S_{12}	0	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1
S_{13}	0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1
S_{14}	0	0	1	1	1	0	1	0	1	1	1	1	1	0	1	1
S_{15}	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1
S_{16}	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0

Figure 1. Influence factors of binary relation matrix directly

3.2 Access of matrix

Factors in establishing a direct relationship between the adjacency matrixes, the operations of adjacency matrix, obtain of matrix.

Is reachable matrix form are used to reflect to connection diagram after a certain length of path between each node can be reached. Its principle is: on the basis of adjacency matrix, by using Boolean algebra operation rule (0 + 0 = 0, 0, 1 + 1 = 1 + 0 = 1, 1 + 1 = 1, 0 * 1 = 0 0 = 0, 0, 1 * 1 = 1 0 = 0, 1), as well as the following formula of matrix R:

$$(A+I)^{K-1} \neq (A+I)^{K} = (A+I)^{K+1}, K \geq 1$$

Type, I order the unit matrix with adjacency matrix.
By computing available of matrix.
After computing the get the following figure 2 R reachable matrixes (from) process.

$R=$

	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S_{10}	S_{11}	S_{12}	S_{13}	S_{14}	S_{15}	S_{16}
S_1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1
S_2	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_3	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1
S_4	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_5	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1
S_6	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_7	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_8	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1
S_9	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_{10}	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_{11}	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S_{12}	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_{13}	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_{14}	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
S_{15}	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1
S_{16}	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1

Figure 2. Factors of matrix

3.3 Structure model is set up

After winning of matrix, element system of class and stratum relation is not clear, so even the matrix R is hierarchically successively. In R reachable matrix, if you have exactly the same line and the corresponding column (S2, S4, S6,S7,S9, S10, S 12, S13, S15 and same S16, S3, S5 is identical to that of the S8), can be reduced. To S2, S4, S6 and S7, integrated, S10, speed 12, / S13, S15 and S16 exactly the same row (column) named S2 ', delete the 4, 6, 7, 8, 9, 10, 12, 13 and 15 row (column) and row (column), 16 to S3 and S5 and S8 exactly the same row (column) named S3, delete row (column) and 5 line 8 (columns). Again will shrink after processing cutting matrix, arranged according to hierarchy has got backbone matrix M, are shown in figure 3 below.

$$M = \begin{matrix} & S_1 & S_{2'} & S_{3'} & S_{11} & S_{14} \\ S_1 & 1 & 1 & 1 & 0 & 0 \\ S_{2'} & 0 & 1 & 0 & 0 & 0 \\ S_{3'} & 0 & 1 & 1 & 0 & 0 \\ S_{11} & 1 & 1 & 1 & 1 & 1 \\ S_{14} & 0 & 0 & 0 & 0 & 1 \end{matrix}$$

Figure 3. The factors affecting the backbone of the array

These factors through the division of the above, can form the structure of the model, can be seen from the backbone in the matrix, the factors influencing the network teaching effect can be divided into four levels:

The First layer: the standard of network S2,students in the course of time S4, students learning tools use S6, student teamwork S7, The use of teachers remote education level S9, teachers' network and multimedia technology S10, teachers' teaching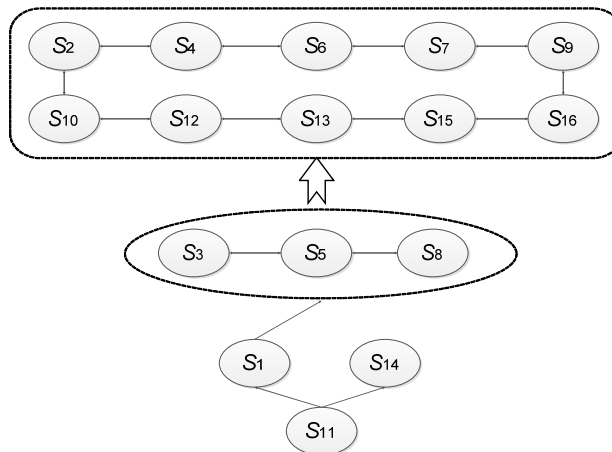 enthusiasm speed S12, teacher's teaching method S13, course acquisition value expected S15, and teaching of the course S16.

The Second layer: student online learning intention of S3, the students' interest in learning the S5, network function S8;

The Third layer: student age S1, the intrinsic value of the course S14.

The Fourth floor: teachers' professional qualities S11.

Establishes the influence factor of network teaching structure model (shown in figure 4) as follows):

Figure 4. Network teaching structure model of influence factors

3.4 Structure model analysis

Directly from the ISM structure model, the network teaching by ten first level factors: the standard of network S2,students in the course of time S4, students learning tools use S6, student teamwork S7, The use of teachers remote education level S9, teachers' network and multimedia technology S10, teachers' teaching enthusiasm speed S12, teacher's teaching method S13, course acquisition value expected S15, and teaching of the course S16.This layer of influence factors is the basic factor, directly affect the network teaching has obvious effect to network teaching factors, need to be particularly important.

The second factor is the deep-seated influence factors of network teaching, students' network learning intention of S3, the students' interest in learning the S5, network function S8, although these three factors is not so important as the first layer, the first level is the secondary factor, these factors play an important role in the essential contact. Student online learning intention of S3 and the students' interest in learning the S5 is the subjective factors influencing the network teaching, network function S8 is the objective factors influencing the network teaching.

The third factor is the student's intrinsic age S1 and course value S14, the two factors is the intermediary factors influencing the network teaching, they are through the second influence factors, therefore, belongs to the indirect impact factors influencing the network teaching.

The fourth factor is the surface factors influencing the network teaching, teachers' professional quality S11 although the impact on the network teaching is not so

directly to the above factors, but without the support of teachers' professional quality, can also pass the negative influence of network teaching.

The four level reflects the influence the logic relation of network teaching, based on this model, distinguish the relationship between various influencing factors, divided into the surface impact factors influencing the network teaching, the middle layer indirect influence factors and the factors influencing the deep root, is conducive to grasp the mechanism of the network teaching development, teaching strategy to provide theoretical guidance for the Internet.

4. SUGGESTIONS FOR NETWORK TEACHING

1) Strengthen the propaganda of the importance of network teaching or learning, improve students' understanding of network teaching. At present, the student to the network teaching recognition is not high, also has the phenomenon of network learning motivation is not pure, therefore, should strengthen the teaching or network for students to learn the importance of propaganda, make it realize the important role of network learning and to its future development, encouraging them to form the correct network learning attitude and learning motivation.

2) Set up a experiential course major assignments, improve the level of students' network. Because of a shortage of students' network learning experience and skills, with the network teaching the impact of the current development status of students, also related to college students' understanding of the network teaching is not clear. Therefore, network teaching should be according to the nature of courses and the need of reality, set up some difficult stage task course into the teaching process, students are required to complete the task through the team cooperation, guides the student to put plenty of time to improve students' ability of using learning tools, to realize the improvement of students' network.

3) To build a typical, drive the other students in online learning. In addition to the propaganda of the importance of network teaching or learning, also should choose those who love the network of colleges and universities students, as a typical give praise or reward, leading to other students online learning enthusiasm.

4) Improve teachers' teaching concept and design ideas, give full play to the advantage of network. Network teaching is not a simple addition of "network" and "teaching", but both together. Network teaching is not a traditional teaching mode simply moved to the network teaching platform, network teaching needs to follow the new teaching concept and design ideas. Therefore, we should improve teachers' teaching concept and design ideas, teachers according to the appropriate mode and idea to design and implementation of network teaching, maximizing the advantage of network, improve the quality of teaching.

5) Exploration team of network teaching mode. Time and energy is the biggest challenge for teachers in network teaching, university teachers' scientific research usually pressure, and the traditional teaching tasks, teachers in network teaching on the time and energy shortage. In order to improve the efficiency of network teaching, network teaching team cooperation mode can yet be regarded as a kind of practical and effective response. Specifically, and the professional, and the formed between subject teachers team, a clear division of labor, the collaborative work, which in a larger extent, guarantee the efficiency of network teaching, can also solve the problem of shortage of university teachers' time and energy.

6) Improve the construction of network course platform. For colleges and universities, the network course construction is a long-term, complex, development process, must treat seriously, actively play their own advantages, in order to do the work better. With the development of further deepening the reform of college education teaching system, and the continuous improvement of the curriculum construction and the change of teaching requirements, the use of students for the course will be more and more requirements are put forward. Therefore, the teacher must be able to skillfully use the Blackboard network platform, perfecting the construction of network course, better play to the role of the network course.

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