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The Study on the Evaluation of Universities' Network Teaching Platforms' Quality in Jiangxi Province

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Abstract: In recent years, network teaching platform has been more and more popular. First, this article describes the development of domestic and international network teaching platform. Second, the development of network teaching platform in Jiangxi province is introduced. Third, the literatures on the evaluation of web sites' quality are reviewed. Finally, the quantitative evaluation system is proposed based on the quality evaluation method (QEM) of web sites. The system includes five indices. They are speed, navigability, teaching information, teacher and faculty information, help information. Network teaching platform of major universities are evaluated using these indices. These indices have important value to enhance the quality of network teaching platforms.

Key words: network teaching platform; evaluation; quality; Jiangxi province

1. INTRODUCTION

Undoubtedly, the information age has arrived. Information and Communications Technology (ICT) represented by computers, multimedia, and networks has been integrated into our life, work, and study. The whole world is undergoing a fundamental change due to the impact of technology. Education is no exception. Information technology (IT) education conference of national primary and secondary schools was held in October, 2000. "Long-term Education Reform and Development Plan (from 2010 to 2020)" was enacted in 2010. The application of educational IT has been up to the national strategy level. It reflects its important role in the educational reform.

However, any educational reform is eventually implemented by teaching and learning. E-Learning as a new way of learning plays a "main force" role in educational reform. Network teaching platform is an important part of e-Learning. The development of network teaching platform ultimately affects the speed and intensity of educational reform. Network teaching platform is also known as online classes, online teaching platform, network teaching management system, and digital teaching systems. It is based on the modern educational technology and IT. A network teaching platform includes online preparation, courseware, teaching material construction, network classes, online communication, online homework, online learning, online examination, teaching quality assessment, and other services to fully support all aspects of teaching and learning.

2. FOREIGN AND DOMESTIC NETWORK TEACHING PLATFORMS

2.1 Development of foreign network teaching platforms

Many foreign countries, especially the developed countries, have invested a lot of material resources in online learning and achieved a certain social benefits. Professor Green from Claremont University initiated and presided over a major research project "Information Campus Plan" in 1990, which marks the emergence of the concept of digital campus. In the United States, 3000 legislature and private universities have established formal websites. Nearly 95 percent of universities have established a wireless network, which provides students with online courses, online course registration, online magazines, reference materials and other services. And nearly 400 universities and colleges offer distant learning via internet. The contents of distant learning cover almost all

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disciplines of colleges and universities, which have completed the transition from traditional teaching to digital teaching on the whole. England is a nation which starts the online teaching earlier. Liverpool University of United Kingdom is actively exploring China's educational market. In foreign countries, network learning platforms have become popular learning resources. Many cities generally provide common and free learning platforms for the public[1].

Most products in the market can provide relatively complete solutions, such as Web CT (Web Course Tools) developed by the Department of Computer Science Columbia University, Virtual-U developed Simon Fraser University, Learning Space developed by Lotus Company, Smart force, Digital Think, and Blackboard. These products support independent learning and real-time learning. And most of them have the functions of tracking, publishing, and managing. Some products synthesize curriculum contents and innovation tools that not only enable the teacher to focus on the teaching content, but also provide the user with a rich and flexible learning experience.

2.2 Domestic network teaching platform

Recently, the construction of domestic digital campus has been developed rapidly. Since the 1990s, some universities in our country, such as Tsinghua University and Peking University, have begun to construct the campus network. And high-speed campus networks have been basically completed. The networks have the functions of online teaching, sharing information resources, academic research, community service, and office management. The government has also introduced a policy of Internet-based teaching. The State Council forwarded "21st Century Education Revitalization Action Plan" proposed by Ministry of Education in 1999. Distant education based on Internet-based was implemented in 1994. Currently, Ministry of Education has authorized 68 universities to conduct distant education. More than 2,000 learning centers have been built all over the country. The number of students reaches more than 2 million. The range of distant education covers all levels of hundreds of disciplines. Meanwhile, many universities increase their investment to establish campus networks and multimedia classrooms[2].

In recent years, a lot of network teaching platforms have been developed at home and abroad. Some platforms are developed by professional companies. Some platforms are developed by universities. Many platforms are eliminated over time because they have some flaws, such as small capacities or instability. However, some platforms have became increasingly popular. Currently, only a small number of platforms have been used in China's colleges and universities. There are four main types. The first type platforms are foreign commercial platforms, such as Blackboard, etc. These platforms have reliable functions because companies have adequate funds and sufficient experiences. But these platforms and their post-sale services are expensive. The second type platforms are domestic commercial platforms, such as Shanghai Excellent Course Center, Nanjing Sky Classrooms, Education Online of Tsinghua University, Jiangsu Ke Jian Online Learning Platform. These products keep up with national or local higher education reform and have good applicability to educational management and teaching requirement[3]. Some products have embedded teaching resources and authoring tools for coursewares. The third type platforms are developed by colleges and universities according to their own needs. They are used in small range. These platforms are developed in accordance with the characteristics of colleges or universities. Thus, the costs of these platforms are low and the objectives of these platforms are clear. But they also have poor compatibility and adaptability. The forth type platforms are developed by open-source software, such as Moodle. The users can perform a personalized design based on free codes.

3.   NETWORK TEACHING PLATFORM OF UNIVERSITIES IN JIANGXI PROVINCE

Colleges and universities choose different types of network teaching platform according to their own

different requirements. Network teaching platforms of universities in Jiangxi Province are investigated in this article. According to a list of colleges and universities in Jiangxi Province announced by Ministry of Education, there are 82 universities or colleges up to July 9th, 2014. There are 53 junior colleges and 29 undergraduate colleges and universities. All home pages of colleges and universities can be opened. It shows that the hardware constructions of campus networks of colleges and universities have been completed and provide the foundation for the development of e-learning.

Universities' names adding network teaching platform as keywords are searched in Baidu. The results show 22 colleges and universities which are 26.8% of all colleges and universities in Jiangxi Province have established network teaching platform. 13 undergraduate colleges and universities which are 59.1% of all undergraduate colleges and universities have established network teaching platforms. Nine junior colleges which are equivalent to 17 percent of all junior colleges have established network teaching platforms. From the perspective of the way to construct network teaching platforms, one university builds network teaching platform by itself and 21 colleges and universities purchase commercial network teaching platforms or cooperate with commercial companies, such as Education Online of Tsinghua University, Sky Classrooms, Fan Ya, URP systems, and Digital University City. From the perspective of construction body, 12 platforms are developed by authorities and 10 platforms are built by teachers and students themselves. Two platforms developed by authorities has been closed. In a word, it can be seen that network teaching platform of colleges and universities in Jiangxi Province are still in elementary stage.

4. EVALUATION OF NETWORK TEACHING PLATFORMS OF MAJOR COLLEGES AND UNIVERSITIES IN JIANGXI PROVINCE

4.1 Literature review about website evaluation

Olsina (1999) proposed website quality evaluation method, which comprises two parts: the quantitative evaluation and comparison of different websites. Quality evaluation of websites includes the following steps: (1) select a website or a series of websites; (2) determine the target websites from the perspective of users; (3) set the characteristics of websites; (4) give each characteristic certain score and evaluate websites using scores; (5) sum all scores of characteristics and obtain the overall score. Evaluation system includes a number of indices and each index can be decomposed into some indicators. The indicators can be further decomposed. The final indicators are given certain score. Once the score of each indicator is given, each index can be calculated. The overall score of websites can be obtained by summing score of each indices [4].

For example, Mateos (2001) evaluated and compared the websites of universities in Spanish. The indices of website evaluation are divided into four types. They are accessibility, speed, navigation, and content. Each type of indices can be divided into several indicators. For example, accessibility can be decomposed into two indicators. They are ranking in search engine and popularity. Accessibility, speed, navigation, and content account for 25%, 25%, 20%, 30%, respectively. An important feature of this study is only using objectively measurable indicators. The purpose of this study is to make the managers find the defects of websites and improve the quality of websites[5]. Olsina et al. (2001) described 100 characteristics and properties of academic websites and analyzed their elements. These elements are evaluated, compared and ranked. They study the evaluation about academic websites from the perspective of three kinds of people, which are students, scholars and academic leaders. In addition, they also provided readers with a structured framework, which consists of types, characteristics, and sub-characteristics[6]. Wu (2005) studied the websites of 10 universities using Alta and Google and obtained web impact factors based on the total number of pages and links. Web impact factors are compared in order to determine the applicability and reliability of websites[7]. Huang et al. (2006) studied 148 B2C e-commerce websites. They establish evaluation system using AHP method. Evaluation system includes

four aspects, namely service indicators, information indicators, technical indicators, and reputation indicators[8].
Wu et al. (2005) thought the websites should be evaluated by intrinsic and extrinsic indicators. Intrinsic
indicators are accessibility, ease of use, quality of information, openness. Extrinsic indicators includes the
average length of stay, the click rate, recognition of websites[9]. Li et al. (2006) believed the goals of surfing the
Internet is to find information quickly and accurately. Therefore, a complete evaluation about websites has three
characteristics, which are completeness, scientific, simplicity. They point out that the indices of websites should
include three aspects, which are website contents, operation functions, business functions[10].

4.2 Constructing an evaluation system on the quality of the network teaching platform

There are no tools to evaluate the network teaching platform. Therefore, it is necessary to propose a new
assessment tool to find the platforms' strengths and weaknesses and improve the quality of platforms. 5 types of
indices are chosen. They are speed, navigation, teaching information, teachers and faulty information, and help
information. These indices are chosen based on the previous literatures and authors' investigation. These indices
reflect the important attributes and characteristics which are widely agreed by users.

The importance of speed is no doubt. Some studies find that the speed of download is positively related to
users' satisfaction. In order to exclude possible errors caused by hardware and networks, tests are conducted
using the same computer at the same time. The tests are repeated five times. The average value is regarded as
the result.

The second type is navigation. Navigation reflects the organization and classification of information. The
tools of navigation should help users understand their own locations and structures of websites. Some scholars
propose two indicators to evaluate navigation: (1) navigation bar; (2) keyword search function in the homepage.
Navigation bar helps users position themselves. Keyword search function can help users quickly find the
information they need.

Building network teaching platforms has three main objectives. The first objective is to release teaching
information. The second objective is to help teacher and faculty obtain information. The third objective is to
help users make use of the platforms. In view of these objectives, the information of platforms includes teaching
information, teacher and faculty information, help information. Course and teaching information include
excellent courses and their rankings, teaching resource libraries, and other learning resources. Teachers and
faculty information are composed of information on teachers, information on distinguished teachers,
information on faculty curriculums and faculty specialties. To help users make use of the platforms, it is
necessary to provide profiles of platforms, announcements, instructions, and contact information.

Table 1. Indices and indicators of evaluating the network teaching platforms

Indices and indicators	points	Indices and indicators	points
speed	5	Teacher and faculty information	20
Response time	5	Common teachers	5
navigation	10	Distinguished teachers	5
Navigation bars	5	Curriculums	5
Search functions	5	specialties	5
Teaching information	45	Help information	20
Excellent courses	30	profiles	5
ranking	5	announcements	5
Resource libraries	5	instructions	5
others	5	Contact information	5

After all types of indices and indicators are defined, these indices and indicators are assigned appropriate

score. Total score is 100 points. Platform information is the most important aspect because releasing teaching information, helping students obtain teacher and faculty information, and helping users make use of the platforms are objectives of network teaching platform. Therefore, platform information accounts for 85 points. 45 points are allocated to teaching information. 20 points are allocated to teacher and faculty information. 20 points are allocated to help information. Speed accounts for 5 points. Navigation accounts for 10 points. These points are allocated according to previous research. Evans et al. (1999) and Miranda et al. (2004) also adopted the similar allocation of points [11][12]. All types of indices and indicators are shown in Table 1.

4.3 Quantitative evaluation of network teaching platforms

This article evaluates network teaching platforms of 10 colleges and universities in Jiangxi Province. URLs of network teaching platforms are shown in Table 2. The goal of study is not to find the best network teaching platform, but to compare platforms and improve the quality of platforms.

4.3.1 Speed

Preference value of speed is binary discrete variable. 1 represents that response time is less than 0.5 seconds. 0 represents response time is greater than 0.5 seconds. Score=points * preference value. Data collection method is automatic. URL is http://www.linkwan.com/gb/broadmeter/speed/ responsespeedtest2.asp. In order to avoid errors, tests are conducted by using the same computer at the same time. The computer is connected with ADSL. Bandwidth is 8M. The result shows that response time of each platform is basically same. All response time is less than 0.5 seconds.

4.3.2 Navigability

Preference value of navigation is binary discrete variable. 1 represents existence. 0 represents inexistence. Score=preference value*points. Data collection method is observation. The result shows that all platforms have navigation bars. 6 platforms have search function and four platforms haven't.

Table 2. URLs of network teaching platforms of 10 colleges and universities in Jiangxi Province

Colleges and universities	URLs
Jiangxi Science and Technology Normal University	http://jpkc.jxstnu.edu.cn/eol/homepage/common/index.jsp
Jiangxi Agricultural University	http://218.95.3.135/eol/homepage/common/opencourse/index.jsp
Nanchang University	http://online.ncu.edu.cn/eol/homepage/common/index.jsp
Jiangxi University of Traditional Chinese Medicine	http://jxutcm.mooc.chaoxing.com/portal/
Donghua Science and Technology University	http://eol.ecit.cn/eol/homepage/common/opencourse/index.jsp?_style=ecit
Jinggangshan University	http://teach.jgsu.edu.cn/
Nanchang University of Aeronautics and Astronautics	http://metc.nchu.edu.cn/scr2006/SchoolSpace/Default.asp
Jiangxi University of Finance and Economics	http://jxufe.xuexi365.net/portal/
Nanchang Institute of Technology	http://wjpt.nit.edu.cn/eol/homepage/common/
Jiujiang Vocational University	http://mail.jjvu.jx.cn/eol/homepage/common/index.jsp

4.3.3 Teaching information

Preference value of excellent course and its rankings, library resources, others is binary discrete variables. 1 represents existence. 0 represents inexistence. Score=preference value* points. Data collection method is observation. The result shows that all platforms have excellent courses. The results also show that 4 platforms

have rankings; 8 platforms have resource libraries; 6 platforms have other resources.

4.3.4 Teacher and faculty information

Preference value of indicators of teacher and faculty information is binary discrete variables. 1 represents existence. 0 represents inexistence. Score=preference value* points. Data collection method is observation. The results show that 6 platforms have information of general teachers; 5 platforms have information of distinguished teachers; 4 platforms have information of specialties; 9 platforms have information of curriculums.

4.3.5 Help information

Preference value of indicators of help information is binary discrete variables. 1 represents existence. 0 represents inexistence. Score=preference value* points. Data collection method is observation. The results show that 8 platforms have information of profiles; all platforms have information of announcements; 4 platforms have information of instructions; 3 platforms have contact information.

Table 3. The score of network teaching platform

Colleges and universities	speed	navigation	teaching information	teacher and faculty information	help information	overall score
Jiangxi Science and Technology Normal University	5	10	40	15	10	80
Jiangxi Agricultural University	5	10	45	20	10	90
Nanchang University	5	10	45	10	15	85
Jiangxi University of Traditional Chinese Medicine	5	5	35	5	15	65
Donghua Science and Technology University	5	10	45	20	10	90
Jinggangshan University	5	5	30	5	10	55
Nanchang University of Aeronautics and Astronautics	5	5	30	5	15	60
Jiangxi University of Finance and Economics	5	5	40	0	20	70
Nanchang Institute of Technology	5	10	40	20	10	85
Jiujiang Vocational University	5	10	40	20	10	85
Mean value	5	8	39	12	12.5	76.5
P value	0***	0.005	0***	0.443	0.052	0***

***denotes P<0.001

The scores of indicators are added. The results are shown in Table 3. The average score of network teaching platforms of colleges and universities in Jiangxi Province is 76.5. The score is significant at the level of 0.001. It means the overall quality of network teaching platforms is quite high. The results show that universities which get the highest score are Jiangxi Agricultural University and Donghua Polytechnic University. Universities which get the lowest score, such as Nanchang University of Aeronautics and Astronautics and Jinggangshan University, can learn from other universities. From the perspective of indices, except for teacher and faculty information and help information, the scores of other 3 indices are significant at the level of 0.05. It indicates teacher and faculty information and help information should be improved. Speed, navigation, and teaching information of platforms have already been perfect.

5. CONCLUSION

This study puts forward quantitative evaluation system of network teaching platform of colleges and universities in Jiangxi Province. 10 network teaching platforms of colleges and universities are evaluated by this quantitative evaluation system, which allows platform designers to compare the characteristics of platforms to find the advantages and disadvantages of existing platforms. Compared with the previous evaluation systems, the biggest feature of this evaluation system is to avoid the subjective factors of evaluation. The evaluation system includes five indices: speed, navigation, teaching information, teacher and faculty information, help information. After network teaching platforms are evaluated by this evaluation system, we find that the overall quality of platforms are rather high, especially in the speed, navigation, and teaching information. But improvements in helping information and teacher and faculty information are needed.

This paper sets the foundation for future research. This study finds that the key indices and indicators of evaluating network teaching platforms. The next step is to use this system to evaluate network teaching platforms of other provinces and test the evaluation system. Furthermore, one can use this system without professional training. With the further increasing information of website design, the evaluation system may be upgraded to an effective tool for designing network teaching platforms.

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