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A Case Study of the Satisfaction of College Students on Blackboard System

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Abstract

Taking the Business College of Beijing Union University as an example, a survey and an in-depth study on the application of Blackboard system for College students about their learning attitudes, experiences, expectations and satisfaction was carried out. The study aims at 5 parts: the safety and stability of system platform, the aesthetics of interface design and accuracy of navigation, the richness and update of resources, the interaction and cooperation between the teachers and students, and the monitoring timely in the whole learning process. Based on the 5 aspects, the views and satisfaction of the respondents' Blackboard system application were investigated and analyzed between different genders, different learning attitudes, different grades and different majors. The results showed that, in general, the students were satisfied with the overall situation of the construction and application of the Blackboard. However, for some of the 5 parts, significant differences were shown between different gender, different learning attitudes, different grades and different majors. The results of the survey provide a certain reference and some suggestions for teachers to further improve the Blackboard-based courses construction and management, and finally enhance students' satisfaction.

Keywords*: Blackboard system; College students; Satisfaction; Questionnaire Survey; Business College of Beijing Union University*

1. Introduction

The Blackboard is a network system combining content resource management, online communication, assessment management and system management together. It integrates successfully into a "teaching" and "learning" environments based on the core curriculum. Thus the Universities and Colleges can use modern educational technology to improve the "teaching" and "learning" experiences in the teaching process. The Blackboard gradually becomes into an important extension and supplement of classroom teaching in Colleges and Universities all over the world. It effectively promotes the new teaching mode, expands the student's learning time and space, and also provides a good platform for communication and cooperation between the teachers and students. But in the process of Blackboard-based curriculum construction and application, are learners satisfied with their learning experiences? Are they satisfied with the security and stability of the system, the correctness of the system navigation, the richness of the system resources, and the interaction between teachers and students? All these problems need to be further study.

In this paper, a survey was carried out about the application experiences, the actual effects, the expectations and their satisfaction of the students from Business College of Beijing Union University. An analysis was made to study the relationship between satisfaction and the gender, grade, major and learning attitude of the students when they use the Blackboard. The concealed reasons were explored and discussed. We hope that through this study to find new ways to promote the quality of higher education.

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2. Research Background

The so-called satisfaction refers to satisfy their own desires, meet their own minds [1]. Since the concept of satisfaction is introduced into the service industry and related fields, the research on customer satisfaction is gradually increased. At present, the academic circles have two basic views. One focuses on the result. The experts and scholars believe that customer satisfaction is the customer subjective feeling and the psychological state to the whole process after the completion of consumption behavior [2]. The other one is focused on the process. The experts consider that customer satisfaction is the evaluation of comparison between their actual consumption experiences and their expectations. The degree of satisfaction depends on the initial level of expectation and perception of the actual level with respect to these expectations [3].

From the above definition of satisfaction it can be seen that the customer satisfaction is a kind of mental state and self-experience. There may be problems to give correct evaluation if it is not adequately and objectively defined. At present, the scholars produced a variety of customer satisfaction index model in the global scope to fit the evaluation of customer satisfaction index. The famous include the Swedish Customer Satisfaction Barometer Index (SCSB), American Customer Satisfaction Index (ACSI) model, European Customer Satisfaction Index (ECSI) model and so on. Chinese Tsinghua University put forward the Customer Satisfaction Index model (CSI) that is suitable for Chinese conditions in 1999 [4],which showed that Chinese scholars' research on customer satisfaction had entered a new stage.

The concept of satisfaction is widely used in the field of education currently. This represents a change of educational view, and is also a performance to show the subject status of students. Overseas research and practice suggests that the learners' satisfaction evaluation has a very strong positive correlation with their academic success, maintenance and College success [5]. Therefore, based on the satisfaction model, researches on the quality and reform of higher education are prolific. With the rapid development of communication technology and network technology today, this study has a great proportion of learning associated with network. Furthermore, the study on distance education satisfaction is more concentrated [5-7]. The scholars have conducted many in-depth study including the stability and safety about the website platform, the supplies of learning resources, the web page design, the students' acquisition from website, the learning support from teachers, communication and cooperation between teachers and students. The scholars investigated the learning satisfaction of students, analyzing the existed problems in the distance teaching system, and put forward many valuable countermeasures and suggestions based on their research objects. But from the literature study it was found that the research of scholars was mainly for part-time distance education, this is significantly different from full-time higher education in the teaching mode, learning mode, time and space between teachers and students. Therefore, its research results cannot be simply transplanted to the full-time College education teaching process.

Different from the distance education, now most of the Universities teaching and learning process is still in a way of face-to-face classroom teaching and communication between teachers and students. So the network teaching platform such as Blackboard is an important auxiliary and supplementary to this kind of teaching. Based on this platform, students can easily complete many learning tasks such as preview, review, research learning, cooperative learning, extended reading and learning effect test. This means that, if the construction of the Blackboard-based courses could obtain students' satisfaction and promote their learning abilities, it would be fully reflected the students' subject position. Furthermore, it would affect the students' learning effect, promote blended learning, and flip the classroom. Therefore, it is much more important and necessary to carry out in-depth investigation and study on the students' satisfaction about their application of

Blackboard. In this study, the research group will concentrate on the students' attitudes of Blackboard application, feelings, expectations and satisfaction, and then put forward some targeted suggestions and references.

3. Research Method

In order to understand the students' feelings and satisfaction in their Blackboard application, analyze their learning experiences and expectations, explore the problems about Blackboard-based courses construction and management, and make the Blackboard truly become a strong support platform for students to learn, the research group used the questionnaire survey to collect data and carry out the research.

3.1. Design Basis of the Survey Questionnaire

In the field of marketing and service industry, customer satisfaction evaluation model has been relatively successful. But now in the field of education, especially for the evaluation of student satisfaction based on their Blackboard application, there is no complete and universal scale. So, when we want to create the specific satisfaction scale, we mainly refer to the research results of Fangxin LIU [8], Yishun WANG [9], Yuying JIAO [10], Lifeng YU [11], Ye ZOU [12], Zhuo DAI [13], Yanfang YU [14], and Guodong ZHAO [15], and make a detailed comparison among their satisfaction evaluation contents, as shown in Table 1.

Table 1. A Comparative Study of Satisfaction Survey

Sequence	Researchers	Classifications	Satisfaction evaluation contents
1	Fangxin LIU	Assistant teaching websites	Content, community, customization, function, appearance
2	Yishun WANG	E-learning	The teaching content, teaching system, display and interface, personal assistant, learning outcomes, learning community
3	Yuying JIAO *et al*	Network information services	Convenience, information quality, personalized content, website aesthetics, help support
4	Lifeng YU *et al*	Continuing education	Network curriculum resources, online tutoring support, network platform function, the effect of online course
5	Ye ZOU	Distance education	Website design, resources, navigation, evaluation system, interactive teaching, learning support, teaching view
6	Zhuo DAI	Network teaching platform	Platform reliability, navigation, contents, interface, artistic pages
7	Yanfang YU *et al*	Electronic teaching system	Learning interface, learning community, personalized contents
8	Guodong ZHAO *et al*	Blended learning	Characteristics of students, teachers, curriculum and system functions

According to the satisfaction theory and the research achievements of scholars, taking the specific situation of Business College of Beijing Union University into account, the research group conducted a fully discussion with some relevant teachers and experts. At last, the students' satisfaction index based on Blackboard application and course construction was determined. It could be mainly divided into the following 5 aspects. (1)

The safety and stability of Blackboard system; (2) The aesthetics of the appearance and correctness of navigation; (3) The richness of the resources and timeliness of update; (4) The interactivity among teachers and students, students and students, students and the learning resources; (5) The effectiveness of learning process monitoring. The following will focus on these 5 aspects to design the questionnaire, and launch the investigation in the Business College of Beijing Union University.

3.2. The Implementation of the Investigation and Data Processing

3.2.1. Research Object

The investigation includes all professional students from the freshman to the junior from Business College of Beijing Union University. Among them, the freshman has little experiences. Before entering the University, they had few opportunities to use Blackboard-based courses to support their learning systematically. So this is a new way for them. The answers to the questionnaire can reflect their most natural state. After one year application, the sophomore has a basic understanding of the function of Blackboard, and has formed the basic attitudes and expectations. For the junior students, after more than two years of using, they have been quite familiar with the Blackboard, and have better understandings for each function in this system. Therefore, they had the most experiences to evaluate whether they were satisfied with the construction of Blackboard-based courses. For all of these reasons, we choose the samples so as to have better representative and higher research value. The basic situation of the sample in this survey is shown in Table 2.

Table 2. The Basic Situation of Samples

Items	Classification	Number of students	Percentage(%)
Grade	Freshmen	37	16.5
	Sophomore	106	47.3
	Junior	81	36.2
	Total	224	100.0
Gender	Male	73	32.6
	Female	151	67.4
	Total	224	100.0
Major	Information Management and Information System	41	18.3
	Financial management	39	17.4
	International Business	38	17.0
	International Trade	31	13.8
	Finance Management	39	17.4
	Marketing	36	16.1
	Total	224	100.0

3.2.2. Research Tools

The survey questionnaire was designed by the research group. The items in the questionnaire were devised according to lots of literature study and repeated discussions with relevant experts and teachers. The questionnaire comes in two parts. The first part is essential information of the survey respondents, including their gender, grade, major and so on. The second part is to investigate the students' satisfaction while they use Blackboard-based courses, including the safety and stability of Blackboard system; the aesthetics of the appearance and correctness of navigation; the richness of the resources and timeliness of update; the interactivity among teachers and students, students and

students, students and the learning resources; the effectiveness of learning process monitoring.

3.2.3. Research Program

This study was carried out in the form of questionnaire survey, the survey respondents came from Business College of Beijing Union University. 242 paper questionnaires were distributed, and all of them were completely taken back, the recovery rate was 100%. In the process of data sorting, eliminating 18 invalid questionnaires with various problems. The valid recovery rate was 92.6%. We used missing values for the individual items lacking of standardization.

3.2.4. Reliability and Validity Analysis

In the questionnaire, with a few exceptions, we basically used 5 levels Likert scale to test the students' attitudes, views and satisfaction based on the Blackboard system. We used 1-5 to represent "totally agree", "agree", "not sure", "don't agree" and "disagree completely" respectively. In addition, we only used single choices in the questionnaire. The results were calculated and analyzed by using the statistics software Spss13.0. The reliability analysis and validity analysis of the questionnaire is shown in Table3 and Table4.

Table 3. Reliability Analysis of the Questionnaire

Dimensions	Alpha coefficient	Items	Total sample
The whole questionnaire	0.938	34	224
Safety and Stability	0.790	6	224
Navigation	0.754	5	224
Resources and update	0.814	6	224
Interactivity	0.810	9	224
Monitoring	0.830	8	224

According to Table 3, overall, the questionnaire homogeneity is very high, the Alpha coefficient is 0.938, and the coefficient of 5 dimensions on Blackboard satisfaction is higher than 0.75, which shows that the questionnaire has a good consistency and stability.

Table 4. Validity Analysis of the Questionnaire

		Total	Safety and Stability	Navigation	Resources and update	Interactivity	Monitoring
Total	Pearson correlation coefficient	1					
	Significance (bilateral)						
Safety and Stability	Pearson correlation coefficient	0.819**	1				
	Significance (bilateral)	0.000					
Navigation	Pearson correlation coefficient	0.792**	0.626**	1			
	Significance (bilateral)	0.000	0.000				
Resources and update	Pearson correlation coefficient	0.865**	0.675**	0.644**	1		

	Significance (bilateral)	0.000	0.000	0.000			
Interactivity	Pearson correlation coefficient	0.895**	0.622**	0.603**	0.715**	1	
	Significance (bilateral)	0.000	0.000	0.000	0.000		
Monitoring	Pearson correlation coefficient	0.838**	0.560**	0.579**	0.638**	0.725**	1
	Significance (bilateral)	0.000	0.000	0.000	0.000	0.000	

*. Represent at the significant level of 0.05 was significant (bilateral).

**. Represent at the significant level of 0.01 was significant (bilateral).

It can be seen from Table 4, all items and the measurement subject is significantly correlated (Pearson correlation coefficient is larger than 0.7, significance less than 0.05). This indicates that the questionnaire has a good content validity.

4. Results and Discussion

Below the research group will conduct a detailed analysis of the students' satisfaction from the following 5 aspects mentioned above.

4.1. The Analysis of Students' Satisfaction with Blackboard Security and Stability

4.1.1. The Fundamental Features

We could learn from the results of the survey, generally speaking, the students were quite satisfied with the security and stability of the Blackboard. The results showed that, 87.1% of the students thought that the process was generally very smooth when they logged on to the Blackboard. 81.7% of the students deemed the speed of browsing and downloading could meet their needs in their use of the Blackboard-based courses. 80.8% of the students considered that the system rarely emerged the phenomenon of system failure or could not logged in. 80.8% of the students thought Video and Audio resources could normally play online. 84.4% of the students believed the picture type and animation type materials could normally display and browse online. In addition, 85.3% of people thought it was safe while they uploaded homework or communicated with teachers and classmates.

4.1.2. Satisfaction of Different Gender and Attitude with the Blackboard Security and Stability

According to the results of the independent samples t-test of the respondents' satisfaction about the Blackboard safety and stability with their gender, and also with their different learning attitude, it could be drawn, generally speaking, in terms of the Blackboard security and stability, there was no significant difference between different gender and different learning attitude.

4.1.3. Satisfaction of Different Grade and Major with the Blackboard Security and Stability

In order to understand the satisfaction with the Blackboard safety and stability of different grades and different majors, the research group had carried out the analysis of variance. The results showed that, different grades, different majors' students had significant differences in part of the items, as shown in Table5 and Table6.

Table 5. Analysis of Variance on Stability Satisfaction of Blackboard in Different Grades

Items	Source	Quadratic sum	Degree of freedom	Mean square	F value	p≤
Generally, it was very smooth when logged on to the Blackboard	Grade	4.550	2	2.275	3.345	0.037
	Error	150.290	221	0.680		
	Total	154.839	223			
The browsing and downloading was normal and the speed could meet my needs.	Grade	4.037	2	2.018	1.915	0.150
	Error	232.959	221	1.054		
	Total	236.996	223			
There had rarely a system failure or could not logged in.	Grade	9.850	2	4.925	3.999	0.020
	Error	272.146	221	1.231		
	Total	281.996	223			
Video type, Audio type resources could normally play online.	Grade	7.105	2	3.552	5.708	0.004
	Error	137.533	221	0.622		
	Total	144.638	223			
Picture and animation materials could be normally displayed and browsed online.	Grade	6.547	2	3.274	2.659	0.072
	Error	272.091	221	1.231		
	Total	278.638	223			
Uploading homework or communicate with classmates was much more safety.	Grade	1.992	2	0.996	1.584	0.207
	Error	138.897	221	0.628		
	Total	140.888	223			

Table 6. Analysis of Variance on Stability Satisfaction of Blackboard in Different Majors

Items	Source	Quadratic sum	Degree of freedom	Mean square	F value	p≤
Generally, it was very smooth when logged on to the Blackboard	Major	11.252	5	2.250	3.417	0.005
	Error	143.587	218	0.659		
	Total	154.839	223			
The browsing and downloading was normal and the speed could meet my needs.	Major	16.617	5	3.323	3.288	0.007
	Error	220.378	218	1.011		
	Total	236.996	223			
There had rarely a system failure or could not logged in.	Major	17.476	5	3.495	2.881	0.015
	Error	264.519	218	1.213		
	Total	281.996	223			
Video type, Audio type resources could normally play online.	Major	22.317	5	4.463	7.955	0.000
	Error	122.321	218	0.561		
	Total	144.638	223			
Picture and animation materials could be normally displayed and browsed online.	Major	20.665	5	4.133	3.493	0.005
	Error	257.973	218	1.183		
	Total	278.638	223			
Uploading homework or communicate with classmates was much more safety.	Major	4.129	5	0.826	1.316	0.258
	Error	136.760	218	0.627		
	Total	140.888	223			

Through the multiple comparisons of different grades, it was found that the freshmen had significant difference with the sophomore and the junior students. With the increase of grades, students' demand for the stability, safety, browse and download speed of the Blackboard increased gradually. Their tolerance of the occasional network instability or the lower speed to open Webpages was declining. Thus affected the satisfaction of higher grade students. But the University freshmen were not very sensitive to these kinds of things. Moreover, for the security use of Blackboard-based uploading or communication, the students of each grade had no significant difference. They were all quite satisfied with the safety of the Blackboard.

According to the multiple comparisons of different majors, it was found that the students from information management and information system major and financial management major had relatively higher requirements for the website speed and stability, whereas other professionals had lower requirements. The results showed that the students from different major had different expectations for the Blackboard security and stability. Students from financial management major reflected their professional characteristics clearly. They were generally more careful and cautious, so they had higher requirements for the security of the system. On the other hand, the specialty of information management and information system involved more professional curriculum about system design, development, security and maintenance, so their students were much more sensitive to the system security and stability. When they learned from the Blackboard-based courses, they paid close attention to the system performance. Therefore, their expectations to the platform were higher than others. This would undoubtedly affect their satisfaction with the Blackboard.

4.2. The Analysis of Students' Satisfaction with Blackboard Interface Design and Navigation Accuracy

4.2.1. The Basic Features

In the aspect of the beauty of the interface design and the correctness of the navigation, most of the respondents were satisfied. Among them, 88.8% of the students thought the interface design of the Blackboard-based course was reasonable; 89.3% of the students thought the navigation design of the Blackboard was in line with their browsing habits; about 86.6% of the students thought that the interface structure was clear and color coordination. In addition, there were 79.9% of the students believed that the function of the Blackboard was completed and could meet their learning needs thoroughly. About 85.7% of the students said yes and expressed their satisfaction in the survey of whether the navigation of the Blackboard was clear and whether the link was correct.

4.2.2. Satisfaction Evaluation of Different Gender and Different Attitude with the Blackboard Interface Design and Navigation Correctness

The results showed that there was no obvious difference between different genders in the view of the aesthetic nature of the interface design and the correctness of the navigation. Only in the topic of whether the interface design was suitable for students' browsing habits, male and female students showed different opinions. Among them, the female students were more satisfied with the current design. They thought most of the Blackboard-based courses had clear interface structure and coordinated color matching, and were more suitable for their browsing habits. But the male students were slightly dissatisfied with the existing interface design. They thought some of the course had more rigid navigation, which were not very suitable for their browsing habits. So they expected more flexible navigation in the future.

For students with different learning attitudes, the results showed a significant difference, as shown in Table 7. The results showed that the students who often logged in

the Blackboard were much more active, and they agreed with the current interface design and navigation settings. Compared with those students who seldom logged in the Blackboard, these students were obviously more familiar with the interface design, the course navigation and the contents link, so they were more comfortable with the use of Blackboard-based courses, and therefore they had higher satisfaction.

Table 7. Independent Sample T-Test for the Students' Blackboard Navigation Evaluation with their Learning Attitude

Dependent variable	Whether often login the Blackboard actively	Mean value	t value	p≤
Overall, the interface design of most courses was more reasonable.	Yes	1.81	-1.373	0.171
	No	2.06		
In general, the majority of the course navigation was more suitable for students browse habits.	Yes	1.72	-2.806	0.007
	No	2.12		
Overall, most of the course had clear design structure and coordinated color	Yes	1.72	-3.837	0.000
	No	2.17		
I thought the function of the Blackboard was completed and could meet my study needs.	Yes	1.82	-2.078	0.039
	No	2.10		
I thought the navigation of the Blackboard was clear, and the link was correct.	Yes	1.77	-2.520	0.012
	No	2.13		

4.2.3. Satisfaction Evaluation of Different Grade and Different Major with the Blackboard Interface Design and Navigation Correctness

Through the analysis of the variance of the interface design and the navigation setting, there was no significant difference among different grades.

However, the survey results showed that the evaluation of the interface navigation design of the Blackboard from different major students was different. The concrete results were shown in Table 8.

Table 8. Analysis of Variance of the Blackboard Interface Navigation Design Evaluation with Different Majors

Items	Source	Quadratic sum	Degree of freedom	Mean square	F value	p≤
Overall, the interface design of most courses was more reasonable.	Major	9.275	5	1.855	1.566	0.171
	Error	258.154	218	1.184		
	Total	267.429	223			
In general, the majority of the course navigation was more suitable for students browse habits.	Major	8.409	5	1.682	3.246	0.008
	Error	112.948	218	0.518		
	Total	121.357	223			
Overall, most of the course had clear design structure and coordinated color.	Major	9.424	5	1.885	3.276	0.007
	Error	125.433	218	0.575		
	Total	134.857	223			
I thought the function of the Blackboard was complete and could meet my study needs.	Major	14.742	5	2.948	4.635	0.000
	Error	138.686	218	0.636		
	Total	153.429	223			
I thought the navigation of the Blackboard was clear, and the link was correct.	Major	11.508	5	2.302	2.809	0.018
	Error	178.631	218	0.819		
	Total	190.138	223			

4.3. The Analysis of Students' Satisfaction with Blackboard Resources Richness and Update Timeliness

4.3.1. The Basic Features

According to the results of the questionnaire, generally speaking, the students were satisfied with the resources richness and the update speed. Among them, about 84.4% of the students believed that the Blackboard provided them rich and necessary learning resources of Text type. About 80.4% of the students believed that the Blackboard provided them necessary Audio, Video and other types of resources. This was slightly lower than the former. For the necessary training exercises, testing questions, expansion reading materials and other resources provided by the Blackboard-based courses, 85.7% of the students expressed their approval and satisfaction. In the timeliness of content updates, 90.6% of the students thought that teachers could update the teaching courseware, the practice and test in the website according to the course schedule. 85.7% of the students said that teachers would inform students promptly in the "notification section" of the Blackboard while the contents updated. In addition, 79.5% of the respondents also indicated that the teacher could update the expanding reading materials or discussion topics and other contents according to the hot issues in real life in time.

4.3.2. Satisfaction Evaluation of Different Gender and Different Attitude with the Blackboard Resources Richness and Update Speed

T According to the independent sample t-test results of students' satisfaction evaluation of Blackboard resources richness and update speed with gender, overall, there was no significant difference between students of different genders. Male and female students both expressed their satisfactions with the two aspects of the Blackboard.

However, the statistical results showed that there had significant difference in some respects about the satisfaction of Blackboard resources richness and its update speed on the basis of students' learning attitude and whether they logged on the Blackboard actively, as shown in Table 9.

Table 9. Independent Sample T-Test for the Blackboard Resources Richness Satisfaction with their Learning Attitudes

Dependent variable	Whether often login the Blackboard actively	Mean value	t value	p≤
For most courses, the Blackboard provided a rich Text type resource for the students.	Yes	1.77	-1.259	0.209
	No	1.94		
For most courses, the Blackboard provided a rich Audio type and Video type resources.	Yes	1.86	-1.917	0.057
	No	2.13		
For most courses, the Blackboard provided the necessary training, testing, extended reading and other resources.	Yes	1.67	-3.557	0.000
	No	2.10		
For most courses, the teachers would inform the students in time via the course website while the contents were updated.	Yes	1.72	-2.098	0.037
	No	2.00		
For most courses, the teachers would update the courseware and exercises according to the course schedule.	Yes	1.73	-1.612	0.108
	No	1.94		
For most courses, the teachers would update the discussion topics and extended reading materials according to the hot issues in real life.	Yes	1.93	-0.797	0.426
	No	2.06		

4.3.3. Satisfaction Evaluation of Different Grade and Different Major with the Blackboard Resources Richness and Update Speed

The investigation results showed that there were significant differences of the evaluation with the Blackboard contents abundance and their update timeliness among different grade students. Through the multiple comparisons, it was found that students' satisfaction from the sophomore and the junior was significantly decreased in the two aspects mentioned above. This reflected that the freshmen had little experience to learn from the Blackboard, so they need time to get familiar with the website functions. For this reason, they had no time to take into account the adequacy of the Blackboard resources and their update speed. But with the increasing grade, the students learning experiences increased, their expanded reading and research demands gradually improved. Therefore, they put forward higher requirements for the Blackboard resources richness and the update speed.

In the aspect of specialty, the results of different majors showed significant differences in the two aspects of the richness and the update timeliness of the Blackboard resources, which was similar to previous statistical results. Through multiple comparisons, it was found that the satisfaction of students from information management and information system major and financial management major was still lower than other professional students.

To save the paper space, two variance analysis tables about the satisfaction evaluation of Blackboard resources abundance and the update speed with different grades and different majors were omitted here.

4.4. Analysis of Students' Satisfaction Based on Blackboard Communication and Collaboration

4.4.1. The Basic Features

There involved 3 aspects to communicate and collaborate via Blackboard. The first one was the interaction between teachers and students; the second was the interaction between the students and the students; the third was the interaction between the students and the learning resources.

The results showed that the students were quite satisfied with this. Among them, about 80.8% of the students believed that the applications of the Blackboard built a good environment for their group cooperative learning. 79% of the students believed that the applications of Blackboard helped them to discuss and cooperate easily. 86.2% of the students expressed their satisfaction for the discussion topics set by teachers in the Blackboard because these topics were closely linked to their learning contents or real-world practical problems. 81.7% of the students thought that the teachers' guidance and evaluation summary was timely. 80.4% of the students thought that the applications of Blackboard were more convenient for them to communicate with the teacher when they encounter difficulties in learning. In addition, about 87.1% of the respondents considered the application of Blackboard was more conducive to the sharing of information and wisdom between teachers and students.

It was also found through the survey that the students were very satisfied with the online discussions and other interactive functions of the Blackboard. Moreover, they gave a high evaluation of interactive problems setting and the guidance for discussions by the teachers. But to our surprise, their enthusiasm was not very high to participate in the discussion and Blackboard construction. The survey showed that only 72.8% of the students would speak actively and express their views fully to the discussion questions. In addition, only 70.5% of the students hoped to become the discussion board moderator, and undertook the corresponding tasks. This proportion was significantly lower than the

proportion of students' satisfaction. It reflected that the students' learning was still relatively passive, so it was worth to cause the teacher's thinking.

4.4.2. The Satisfaction Evaluation of Different Gender, Different Learning Attitude, Different Grade and Different Specialty to Blackboard Interactivity

In order to understand whether there existed significant differences of different gender, different learning attitude, different grade and different specialty about the satisfaction evaluation to the Blackboard interactivity, the research group carried out an independent sample t-test of the Blackboard interactivity with gender, an independent sample t-test of the Blackboard interactivity with learning attitude, a variance analysis of the Blackboard interactivity with grade, and a variance analysis of the Blackboard interactivity with specialty. The results showed that there were no significant differences in the Blackboard discussion and interaction between males and females, and the students in different grade were not significantly different in general. However, the students with different learning attitudes and different majors had significant differences. From the statistical data it could be drawn that the students who often login the Blackboard learning were more active in interactivity. Through the multiple comparisons of different majors, we found that the students of financial management and information management and information system had higher demands on the Blackboard interactivity, so the two majors' students had lower satisfaction. Compared with the two majors, the other four professional students' satisfactions were higher, and there were not big difference among them. From this result, it would be obtained that the 6 majors of the College of investigation were divided into two groups, the difference between the two groups was significant.

4.5. Analysis of Students' Satisfaction Based on Blackboard Monitoring and Evaluation of Learning

4.5.1. The Basic Features

The target of College students learning is not only for knowledge, but also for the cultivation of abilities. After four years of College training, College students should to have the abilities to allocate time according to plan, to improve their expression from communication, to catch problems from thinking, to seek truth from exploration, and to evaluate their learning behaviors and effects of feedback in all directions. Modern educational technology, especially the widely used network teaching platform in Universities provides College students a very convenient way for understanding the surrounding companions and teachers evaluation through technical means so as to monitor their own learning. How do the students deal with it? Are they satisfied? What is the effect? Aiming at these problems, we carried out a survey which was well-designed and pertinent researched.

The results showed that the students expressed their recognition and satisfaction for the monitoring function of Blackboard. Among them, 85.3% of the students thought that the Blackboard was more helpful for them to monitor their learning process and effect, and the same proportion of students thought it was more conducive to promote their learning results evaluation and reflection. In addition, about 86.2% of the students thought that the processing grades could feedback to them in time through the Blackboard, so they could discover the problems existed in their learning, and accordingly adjust their learning strategies to improve the learning effect. About 82.6% of students were more satisfied with the Blackboard "Test Section" because of the real-time display of the score. 83.9% of the students were satisfied with the real-time display of the correct answer and explanation for the answer as soon as the online test was over.

4.5.2. The Satisfaction Degree of Different Gender, Different Learning Attitude, Different Grade and Different Specialty to Blackboard Monitoring and Evaluating Learning Situation

From the results of the survey, there were no significant differences between male and female students in views of the Blackboard monitoring to the learning process and the effect. Moreover, both male and female students were almost unanimous on whether to display the grade, whether to display the correct answer and whether to display the explanation to the answer of the online test. For this section, there were no significant differences between different genders. However, the difference between the students of different gender was larger on whether the Blackboard could promote the students to evaluate and reflect on the results of the study. The female students tended to think that the Blackboard application promoted their evaluation and reflection on the results of the study. This reflected the girls paid more attention to the learning process. On the other hand, the difference between girls and boys were also relatively large in the attitude towards feedback of Blackboard. The recognitions of female students were much higher than male students, reflecting the more attentive and more sensitive characteristics of the girls.

According to the independent sample t-test results between students of different learning attitudes and their views about Blackboard monitoring and evaluation, it was drawn that those students having positive learning attitudes and often taking the initiative to login the Blackboard were more satisfied with the Blackboard learning process monitoring, timely understanding of their academic performances and promote their learning results from the website evaluation and reflection. It reflected these students had positive attitudes to understand and control their studies. On the other hand, it also showed that there were still some students, who were deficiency in the participation and paying attention to their studies, their attitudes of study were still relatively passive, and could not actively and effectively use the facilities provided by the Universities to carry out their studies, explorations and researches. This deserved highly attentions of all the teachers.

From the survey results it was also obtained that there were no significant differences among different grades on the opinion of whether the Blackboard promoted students to monitor their learning processes and effects, and whether it improved their evaluations and reflections of their learning results. But for these questions, the differences among different majors were very significant. Through the multiple comparison results among different majors, it was found that the financial management professional students had a strong reflection on all aspects of the learning process monitoring through the Blackboard, and the second was the information management and information system major. Both of the two specialty students had very strong feelings and requirements for their usual performance feedbacks, online test scores displayed, and answer explanations in time through the Blackboard platform, whereas other specialties were not obvious. This result was consistent with the results of the satisfaction degree of the Blackboard interaction discussed above. Financial management professional students and information management and information system professional students were shown different attitudes and features with the other 4 professional students.

5. Conclusions

In this paper, a deep investigation and study was carried out to explore the attitudes, feelings, satisfactions and expectations of Blackboard which was widely used in Universities and Colleges. The research was divided into 5 aspects, including the safety and stability of system platform, the aesthetics of interface design and accuracy of navigation, the richness and update of resources, the interaction and cooperation between the teachers and students, and the monitoring timely in the whole learning process. It was

found after the research that different gender, different learning attitude, different grade and different professional students had similar or different views and satisfactions in the 5 aspects which would be concluded and summarized in the following parts.

(1) Overall, the students were satisfied with the whole situation of the construction and application of the Blackboard. The proportion of students holding this view reached 89.3%. There were no significant differences in the degree of satisfaction among the students of different gender, different grade, different major and different learning attitude.

(2) The students of financial management and information management and information system showed a high degree of consistent attitudes and behaviors with their professional characteristics. In terms of the security and stability of the system platform, interface design and the correctness of navigation, the resources richness and update speed, the communication and interactivity based on the Blackboard, especially the monitoring and evaluation of the learning process, these two professional students were revealed significant differences with other professional students. They had a higher demand for the construction and application of the Blackboard, and at the same time, their utilization was also higher.

(3) There were no significant differences in the 5 aspects mentioned above between the students with different gender. Only in the view of the interface design of the Blackboard, male and female students showed different views. Compared with the female students, male students expected that the navigation should be more convenient and flexible in the Blackboard interface design in order to adapt to their browsing habits. In addition, the female students had a higher recognition attitude for whether the Blackboard could promote the students to evaluate and reflect the processes and results.

(4) The students of different learning attitude had some differences in the above 5 aspects of the investigation. In comparison, the students who had the habits of regularly study, research, online testing and monitoring of the learning process via the Blackboard had higher satisfaction evaluation. Moreover, they were also more positive and active in the study and communication in the Blackboard platform.

(5) The students in different grades also had some differences in the above 5 aspects of the survey. This was mainly manifested in high grade students who had higher requirements on the Blackboard security and stability, especially on the resource richness and update speed. This reflected as the increasing of grade, students' independent learning and research abilities were gradually improved. Therefore, the demands of the important platform Blackboard to provide learning resources for the higher grade University students were also increased.

(6) Through this survey it was found that the students were very satisfied with the auxiliary role of the Blackboard for their learning. Among all the respondents, about 87.9% considered the Blackboard had great contribution for their autonomous learning and research work, 92.4% of the students believed that the Blackboard was an important platform for their daily learning, 89.3% of the students thought that the application of Blackboard was more conducive for their repeated learning to the difficulties and key contents of courses inside or outside the lesson.

For the auxiliary learning effects of the Blackboard, there was no significant difference among the students of different grade and different majors, but there had obvious difference between different gender and different learning attitude. In general, the female students and the students who often logged in the system to learn showed more recognition of the promotion of their learning based on the Blackboard.

In addition to the above aspects of research results, the group also studied the problems and the needs to be improved of the Blackboard in order to perfect the platform function, and to further develop its effects on students learning. The feedback information of students' first-hand was collected and analyzed. Results showed that students put forward many suggestions such as the contents and teaching resources of the Blackboard should

be enriched further, the discussion topics should be closer to the real life, and the teacher's feedback on the discussion, communication and test results should be more timely. In particular, they suggested that the University should further improve the infrastructure, so that the access to the Blackboard could be more easily and safely.

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