

Multimedia Application in Chinese Higher Education

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Abstract—This research investigated both teachers and students in a University in China on the basic conceptions of multimedia and their perceptions of multimedia application. Despite the concepts and perceptions, this research also investigated the problems existed in multimedia application. In the end, suggestions were given to dealing with these problems.

Keywords- *conception of multimedia; perception of multimedia; applicability of multimedia; curriculum integration*

I. INTRODUCTION

Multimedia has a significant role on the improvement of teaching quality and efficiency (Xu, 2010), and it has good effect in Chinese Higher Education, but meanwhile many problems have revealed. First the cognition to the application of multimedia is not so percipient, and many faculty members cannot realize the importance of integrating multimedia into their curriculum (Chen, 2001). Some teachers still used multimedia just for administrative tasks (Blanche W. O'Bannon & Kathleen Puckett, 2010). Large numbers of university faculty do not have adequate technology skills (Zhang & Huang, 2001). Furthermore, multimedia teaching has become the republication of the traditional teaching (Wang, 2001). In addition, the equipments cannot match the application. Many of the computers in the classrooms were outdated and incapable of running current software programs, or lacked important hardware components. Last but not the least, the administrating system for managing and maintaining the equipments is not sound (Wang, 2010).

How to use multimedia to improve the teaching quality of universities in China has become a problem. In order to assess the actual role multimedia played in undergraduate instructions and solve the problems, a large-scale survey was conducted in a university in China among the freshmen, sophomores and seniors in October, 2009. The findings are divided into four parts: The first part is about the basic information of the participants, aiming to make out if these factors have any impact on the adoption of multimedia tools. The second and third parts focus on the conceptions and perceptions about multimedia and multimedia application. The fourth part aims to investigate problems existed in multimedia application. In the conclusion, solutions to the problems are listed.

II. RESEARCH APPROACH

This survey was carried out among the teachers and students who are the users of multimedia. Descriptive Statistics were used to analyze the collection of data to find out participants' multimedia concept and knowledge, multimedia

adoption, their perceptions and attitudes towards multimedia. Analysis was also done to the users in order to find out if those demographic differences will have any influence on knowledge acquisition, any impact on the multimedia adoption, and so on.

The following two research questions guided this research:

Research Question 1: What are the participants' perceptions of multimedia application?

Research Question 2: What are the problems of multimedia application in the participants' views?

III. RESEARCH SITES

A. Participants

In this study, teachers and students were investigated about the application of multimedia and problems existed when multimedia was used in a Chinese university. In view of the effectiveness and feasibility of the questionnaire, the investigation adopted closed and open ways. Random sampling was used to collect data through a questionnaire. Twelve colleges of the university answered the questionnaire with a total number of 980 students and 171 teachers. Those teachers and students were selected because they were willing to support the study. The number of valid questionnaires basically reflects the application of multimedia in this university, so it makes sense.

B. Instrument

The survey questionnaire consists of 46 items, which are divided into five sections. Section 1 consists of 6 demographic questions about participants' gender, age, learning time, grade, marital status, academic status and whereabouts. This section intends to collect the data to find out if these factors have any impact on the adoption of multimedia tools. The 10 questions of Section 2 collect data on teacher and student level of knowledge about multimedia, which will provide information on the potential resource which can be used for learning purposes. Section 3 has 8 questions, which cover the teachers' and students' different perceptions and attitudes towards using multimedia as teaching and learning technologies. Section 4 has 20 questions, which cover the problems when teachers adopt multimedia as teaching and learning tool. Lastly, section 5 is composed of 2 open questions related to the suggestions to using multimedia.

IV. FINDINGS AND DISCUSSION

big picture of the participants. Data on perceptions towards multimedia application reflect teacher and student acknowledgement of multimedia in teaching and learning. The most important are problems existed in the application of multimedia in teaching and learning process, as well as the suggestions to dealing with the problems.

A. Demographic Analysis

A total of 1151 teachers and students gave valid responses in the survey. With this population, there was almost an equal division of gender, 56% of females and 44 % of males. The participants' age range was between 18 and 59. In the teacher group, 11 are professors which occupy 6.4% of the teachers, 60 are associated professors (38.6%), 48 lecturers (28.1%) and 46 assistants (26.9%). Teachers occupy 14.9% of the total participants. See Table I and Figure 1 for detailed academic division.

TABLE I. ACADEMIC STATUS OF TEACHERS

Professional title	Number	Average age	Percentage
Professor	11	53	6.4
Associated	66	42	38.6
Lecturer	48	36	28.1
Assistant	46	27	26.9
Total	171	39.5	100

The survey collected student demographic information in regard to their gender, age, and grade, major and marital status with the intention to find out if these variables would affect student perceptions and attitudes towards multimedia and their application of multimedia. 100% of the students were in the age group of 18 to 24. With regard to marital status, 100% of students were single. Based on the analysis, there is no significant difference between genders and among age groups with regard to the knowledge of multimedia concept.

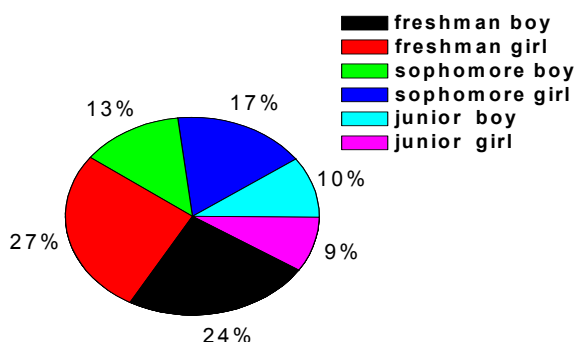


Figure 1. Academic Status of Student

B. Participants' Conceptions of Multimedia

1) Frequency of Multimedia Application

The research result from the students showed that over 90% of the students know about multimedia. They are familiar with multimedia, which made it valid for further questions. But when referring to the hardware and software resources of the university, most students showed they had no idea about this.

In the questionnaires to the students, 980 copies were valid responses. In the courses students choose, the students think that 23.5% are all-multimedia aided ones. Mostly-multimedia aided courses occupy 60.7%. Some teachers seldom use multimedia in their classes, but never-multimedia aided courses are only 1.8 % (see Table II).

TABLE II. FREQUENCY OF MULTIMEDIA APPLICATION

Item	Frequency	Percentage
All-multimedia aided	230	23.5
Mostly-multimedia aided	595	60.7
Sometimes-multimedia aided	137	14.0
Never	18	1.8
Total	980	100

In the questionnaire to the teachers, 117 were valid responses. Most teachers answered that they often use multimedia, and they could make the courseware by themselves. They are basically satisfied with the teaching surroundings. They usually adopt the ways of group cooperation, group discussion and mutual-activity. Overall, most teachers use multimedia, but their skills need improving.

2) Students' Reflection to Multimedia Application

Students are the main body of teaching activity, so they have the right to value the class instruction. In this survey, most students are satisfied with the application of the multimedia in class instruction. They thought that multimedia courseware can solve important and difficult problems and display the contents that cannot be solved in traditional classes. Multimedia plays an important role in activating the atmosphere in the classrooms and meanwhile can improve the learning efficiency. Students can check the courseware and communicate with teachers anytime they like. In this survey, the reasons why students are satisfied with multimedia are investigated.

TABLE III. INSTRUCTIONAL METHODS OF MULTIMEDIA APPLICATION

Item	Frequency	Percentage
Teacher-centered	73	42.7
Student-centered	32	18.7
Teacher-student negotiated	63	36.8
Never considered	3	1.8
Total	171	100

It is not like in traditional classes in which teachers are dispensers of knowledge. If multimedia is used properly, students' roles as active learners and inquirers will be strengthened. About this question, a survey is also conducted to find out what instructional methods teachers adopt when they gave their lessons with multimedia as aiding technology. 42.7% of the teachers thought when giving lessons, the classes were teacher-centered; 18.7% of the teachers thought that the classes were student-centered; 36.8% thought the classes were teacher-student negotiated, while 1.8% of the teachers thought they had never considered about this. About this result, please See Table III.

3) Degree of Teachers' Mastering Multimedia Technology

In the survey to teachers about to which degree they could master multimedia, 11% of the teachers said they could use multimedia freely in a professional way, 64% of the teachers could use multimedia technologies to make PPT for instructing a class, 17% only knew something about multimedia, while 8% of the teachers knew nothing about multimedia.

TABLE IV. TEACHERS' MASTERING MULTIMEDIA TECHNOLOGY

Item	Frequency	Percentage
Professional	19	11.1
Familiar	109	63.7
Know some	29	17.0
Know little	14	8.2
Total	171	100

C. Participants' Perceptions of Multimedia Application

Awareness of users' attitudes toward multimedia is a critical criterion in the evaluation of multimedia courses and development of multimedia computer-assisted curricula. Attitudes toward multimedia-enhanced instruction are considered to influence not only the acceptance of this medium of instruction, but also future behaviors in the learning process. These attitudes include their perceptions about the applicability of multimedia in curricula, teachers' tendency towards using multimedia and taking part in technology training, etc.

1) Attitudes towards the Applicability of Multimedia in Curricula

The applicability of multimedia presents if multimedia can be applied in all courses. Using multimedia in teaching and learning has shown the applicability not only from the overall but also single effects. 14% of the students and 44% teachers agree with the applicability of multimedia in all courses, while 86% of the students and 56% of the teachers don't think so. About this problem, there exists a big difference between teachers and students and among teachers themselves.

We can find from the specific analysis to colleges that the answers of the teachers in College of Business, College of Science and teachers in College of Applied Mathematics are close to the students', while teachers in Foreign Language College, College of Liberal Arts and Academy of Fine Arts support the application of multimedia.

The survey involved many courses, and teachers and students have different opinions about the adoption of multimedia in these courses. Among College English, Linear Algebra, Western Economics, Design Color, Series and Foreign Literature, the effects of the multimedia are different. College English, Foreign Literature and Western Economics rank the top three. Humanities and Social Science rank higher than Science.

2) Teachers' Attitudes towards the Multimedia Application in Class

Although as we mentioned in the former part that 56% of the teachers don't think multimedia can apply to all courses, most of them agree that some courses can adopt multimedia. Among 171 teachers, 140 support the application of multimedia. This rate is very high, reaching 81.9%. Teachers who are against the application of multimedia only occupy 1.8%, which shows although not all teachers support the application of multimedia, few are against it. Other 10.5% of the teachers think that it doesn't matter whether use multimedia or not in their teaching (see Table V to find the ratio of the attitudes). Most teachers think that multimedia play an important role in relieving inadequate teachers and classroom resources in China.

TABLE V. TEACHERS' ATTITUDES

Item	Frequency	Percentage
Favor	140	89.1
Not favor	10	5.8
Against	3	1.8
Doesn't matter	18	10.5
Total	171	100

3) Attitudes towards Taking Part in Multimedia Training

Frequency for teachers to take part in multimedia training will directly affect the quality and effect of classroom instruction. It is the embodiment of university leaders' and teachers' attitude towards the application of multimedia. In this survey, although 6.4% of the teachers never took part in any training, most teachers took part in training often or once in a while, occupying 93.6%. Education Technological Department of his university has given training to teachers all over the university on multimedia use. This can show this university leaders attaché importance to multimedia. See Table VI to find the frequency of teachers' taking part in multimedia training.

TABLE VI. FREQUENCY OF TEACHERS' TRAINING

Item	Frequency	Percentage
Often	61	35.7
Now and then	99	57.9
Never	11	6.4
Total	171	100

D. Problems Existed in Multimedia Application

1) Improper Use of Multimedia

In the survey, over 70 percent of the students thought that there were problems when teachers use multimedia to give instructions, while 23.6% of the students had different opinions. 40.5% of the students thought that teachers use courseware to give lessons instead of giving any instruction.

6.7% of the students thought that teachers use the contents of the textbook to take the place of courseware. 26.1% of the students thought that some teachers did not make the courseware by themselves; instead they project the textbook or their papers directly. And some students thought that some teachers only play audio equipment in their classes.

2) Teachers' Skill Needs to be Improved

According to the survey, aged teachers are experienced in teaching but lack the ability of gaining and applying multimedia information; young teachers are just the opposite. In class, they are standing by the computer and students are fixing their attention only on the screen, and therefore, there is no eye contact between teachers and students.

Many teachers also think that if multimedia is not properly used, the teaching quality is also affected. According to the survey, when multimedia is used, there often too much information for the students to follow. Many students think that too much information also interfere their digestion of knowledge. See the following tables.

TABLE VII. TEACHERS' IDEAS OF THE INTERFERENCE TO STUDENTS

Item	Frequency	Percentage
Too much information	60	35.1
Lead to distraction	40	23.6
Too small characters	36	21.0
Cannot grasp teacher's idea	27	15.6
Not used to multimedia	8	4.7
Total	171	100

TABLE VIII. STUDENTS' IDEAS OF THE MULTIMEDIA'S INTERFERENCE

Item	Frequency	Percentage
Completely rely on courseware	325	33.1
Low level of the courseware	254	25.9
Lack of interactivity	173	17.7
Teachers' unfamiliar of multimedia	125	12.8
Poor expression	103	10.5
Total	980	100

3) Management of Multimedia Needs to be Improved

There are many problems referring to management. In some classrooms, the equipments are not complete. Some classrooms are too big, the curtains are too thin to shut down the sunshine, audio effect is not so good, and the position of the screen is not in a proper place.

After fixing the multimedia equipments, much hardware cannot be updated in time because of the expensive investment, so the equipments become old and out of date, and there often happen breakdowns.

Multimedia teaching related to many departments, including teaching senate, equipment, teachers, personnel and financial department and other functional departments. Sometimes there lacks of integrated management of multimedia teaching between departments, so the management efficiency is not high.

The professional quality of the stuff in charge of multimedia is different. Sometimes high-quality services cannot be given.

V. CONCLUSION

From this survey we can learn that multimedia plays a positive role in promoting students' initiatives, cultivating students' learning interests, activating class atmosphere, and improving teaching effect and so on. But there are still many problems in multimedia application, such as teachers' improper and unskillful use of multimedia, poor management in multimedia application, etc. In order to solve these problems, some measures should be taken. First of all, multimedia cannot take the place of traditional teaching completely. Computer is after all a machine operated by human, and teachers' emotion cannot be incarnated by it. Second, the courseware should well be designed to get rid of useless interference. Third, the amount of information in the courseware should also be well controlled, for too much information will add students' burden which perhaps get them lose study interest. Fourth, a sound management system should be set up to make all the functions of multimedia run well. And the most important, make sure to make use of every opportunity to raise teachers' skills of using multimedia, which is the premise of effective education in Higher Education in China.

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