

# Application of Information and Communication Technology: A Case Study of Teaching Effectiveness

Zhang Jurong<sup>1</sup> Kong Hshanglan<sup>2</sup>

<sup>1</sup> University of Air Force Engineering, zhangjurong@126.com

<sup>2</sup> University of Air Force Engineering, Kh1725@sina.com

## Abstract

This paper analyses the application of ICT in teaching and the effectiveness of teaching with ICT with a survey. Data was collected via questionnaire of students in our university. The results show that application of ICT in teaching is becoming a common practice, but more efforts need to be done to improve the effectiveness of ICT, such as teacher development, hardware development and software development. Students have a high positive attitude towards the use of ICT, however, teachers must change the students' perception and their attitudes towards the ICT in order to use ICT meaningfully.

**Keywords:** ICT technology; application of ICT in teaching; effective of teaching with ICT

## 1. Introduction

The application of Information and Communication Technology (ICT) for teacher development is an increasingly important area. The role of technology in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary education. It has become, within a very short time, one of the basic building blocks of modern society (UNESCO, 2002) [1].

The importance of ICT is quite evidence from the educational perspective. ICT provides higher interactive potential for users to develop their individual, intellectual and creative ability. Through the simultaneous use of audio, text, multicolor images, graphics, motion, ICT gives ample and exceptional opportunities to the students to develop capacities for high quality learning and to increase their ability to innovate.

ICT is currently being used in education to assist students to learn more effectively and help teachers to do administrative tasks more efficiently (Neil Selwyn 2003) [2]. In other words, Information Communication Technology in education has made it possible for students, teachers, specialists and researchers to collaborate with each other in diverse ways.

ICT has many beneficial uses in education. For example, ICT is a powerful tool in presenting or representing information in many different ways. It can be presented through different forms such as texts, pictures, tables, graphs and even multimedia which can make the class more interesting and lively. Besides, ICT can also play various instructional roles such as make the learners feel more relax to learn the various topics and task, and also make the learners active, because they learn by applying the technology to a task rather than by being directly "instructed" by the technology (Grabe & Grabe 2005 [3].

## 2. Methodology

This study conducts a survey of the situation and effectiveness ICT application in teaching. The instrument for data collection is a questionnaire of twenty questions for the students concerning the use of ICT and the effectiveness of teaching with ICT.

A sample of 230 subjects is used, out of which 88 are female students and 142

males. These students are receiving education in the AFEU. They are of 25 majors and in 4 grades taking a large variety of courses. The data were analyzed using percentages.

## 3. Findings and Discussion

The results of the survey are shown in Table 1 and Table 2.

Table 1. Application of ICT in Teaching

Questions	Answer A (%)	Answer B (%)	Answer C (%)	Answer D (%)
1. Which do you prefer, traditional teaching or teaching with ICT	ICT (45.2)	Blackboard-writing (12.7)	Both (30.5)	Either (11.6)
2. In class, the teachers often use	Computer and projector (4.8)	Multimedia (80.4)	Net-based classrooms (14.8)	
3. The most frequently used form of ICT presentation is?	Courseware (70.8)	Slides (2.4)	Audios and videos (20.5)	Network (6.3)
4. ICT should be used in	All the courses (28.9)	Some courses (68.3)	Not matter much (2.8)	Not necessary (0)
5. What should be presented in teaching with ICT?	What is in the textbook (2.9)	what will be tested in the exam (8.5)	What is in the textbook + broader knowledge (30.0)	What is in the textbook + relevant practice (58.6)
6. The most important use of ICT is	To present the teaching materials more vividly (39.8)	To solve the problems in teaching (9.2)	To increase my motivation (45.8)	To create an automatic learning environment (11.2)
7. In ICT-assisted teaching, the students pay more attention to	Contents (9.24)	Videos and audios (22.49)	Courseware + explanation by teachers (67.07)	
8. In ICT-assisted learning, the teacher pays more attention to	Only the courseware (12.5)	Sometimes asks the students whether they	Often pay attention to the response of the	Pay more attention to the students than to the

		understand (23.5)	students (28.9)	courseware (35.1)
9. Can ICT solve the problems in tradition teaching methods.	Solve all the problems (12.1)	Solve some of the problems (69.9)	Cannot solve the problems (10.1)	Don't know (7.9)
10. What is the most important aspect of present investment?	Hardware development (17.7)	Software development (21.3)	Teacher development (51.0)	

Results tabulated in table 1 showed the present application of ICT in teaching in general. First of all, a great majority (85.7%) of the students surveyed prefer teaching with ICT, among whom 30.5% of them like teaching with combined use of traditional teaching and teaching with ICT. Items 2 and 3 show multimedia-based courseware is the most common means of ICT teaching. As for items 4, 5 and 6 concerning the scope of ICT application in teaching, it shows that the majority (68.3%) think ICT can be used in some of the courses. In ICT-assisted teaching, students want to learn

more than what is in the textbook and they want the teaching materials to be presented more vividly so that to arouse their interest in learning. Items 7, 8 and 9 deal with the way ICT can be applied. The data show that both the teachers and the students are aware that ICT is not everything, but that it is only an teaching aid. We should not be too dependent on ICT. And finally, for item 10 "What is the most important aspect of present investment?", teacher development is considered the most urgent aspect of investment, and hardware and software also need further investment.

Table 2. Effectiveness of Teaching with ICT

Questions	Answer A (%)	Answer B (%)	Answer C (%)	Answer D (%)
1. The equipment malfunction occurs	Often (31.3)	Sometimes (64.7)	Never (4.0)	
2. Can the present equipment satisfy teaching?	Yes (16.06)	Basically (61.85)	No (22.09)	
3. The teachers' ability to use the ICT are	Very good (21.5)	Good (34.6)	Not bad (28.8)	Poor (15.1)
4. The most essential factor which affects ICT-assisted teaching is	Short of software (40.1)	Teachers unable to make courseware (29.3)	Teachers unable to skillfully use the machine (12.2)	ICT not fit for a course (18.4)
5. For Powerpnt presentation, the best interval for each page is	10 seconds (4.4)	30 seconds (30.4)	1 minutes (38.9)	More than 1 minutes (26.3)
6. The sound used in turning Powerpnt pages is	Unbearable (17.8)	Distracting (38.7)	Attractive (24.8)	No difference (19.1)
7. The backgrounds in Powerpnt pages are	Very important (24.8)	Sometimes important (41.3)	Not important (11.7)	Don't care. (12.6)
8. The coursewares made by teachers are	Very good (18.88)	Not bad (71.89)	Poor (9.23)	

9. After class, the students like to learn with	Net-based interactive courseware (34.3)	Courseware on a single computer (61.7)	Just learn from the textbook (4.0)	
10. The use of ICT allows me to take greater control on my learning	Strongly agree (62.1)	Agree (18.2)	Disagree (18.2)	Strongly disagree (1.5)

The figures tabulated in Table 2 revealed the effectiveness of ICT application which to some extent verifies the data in Table 1. Items 1, 2, 3 and 4 show that the equipment and the teachers' ability to use the ICT are not very satisfactory. The malfunction of the equipment poses a problem to the teaching with ICT and teachers should try to keep up with the development of ICT technology. Item 5, 6, 7 and 8 deal with the effects of courseware presentation. Item 5 shows that the best interval between each page of courseware is between 30 seconds to 1 minute. Items 6 and 7 show that the use of sound in turning courseware pages is not necessary while the backgrounds in courseware pages are important. Item 8 discusses the quality of coursewares. It shows that making multimedia courseware becomes a technology that a teacher should master. As for Item 9, 34.3% students prefer net-based interactive courseware while 61.7% prefer courseware on a single computer. Perhaps this is due to the limitation of the students' computer skills or the limited availability of net-based coursewares or classrooms. Regarding the item "The use of ICT allows me to take greater control on my learning", majority of the students (80.3% ) agree with the statement. This shows that students are highly motivated to use ICT. However, there were still a small number of students' holds negative attitudes towards the use of ICT. Therefore, it is essential for the teachers to sustain and promote students attitudes because ICT could provide various benefits to them in their learning (Melor MD YUNUS et al 2009) [4] .

#### 4. Conclusion

Findings from this study found students have a high positive attitude towards the use of ICT. From this, we can interpret that students felt positive towards the use of ICT. This shows that students are highly motivated to use ICT. However, more efforts need to be done to improve the efficiency of ICT application in teaching, such as equipment, hardware, software and teacher development. Previous experiment has found that students who use ICT achieved better results in communication, cooperation and in solving problems. However, actions need to be taken in order to help the students overcome their problems. Teachers must changed the students' perception and their attitudes towards the ICT. Teachers could instil students' confidence level on ICT through encouragement of using the ICT tools and guide the students step by step on the way to use ICT meaningfully (Melor MD YUNUS et al 2009) [4] .

#### 5. References

- [1] UNESCO, Co-ordinator: Evgueni Khvilon, Editorial co-ordinator: Mariana Patru, Information and Communication Technology in Education—A Curriculum for Schools and Programme of Teacher Development, Division of Higher Education. UNESCO 2002.
- [2] Neil Selwyn. ICT in Non-Formal Youth and Adult Education: Defining Territory. OECD/NCAL International

- roundtable, Philadelphia, 2003. Retrieved July 19, 2008 from [http://www.literacy.org/ICTconf/OE\\_CD\\_Selwyn\\_final.pdf](http://www.literacy.org/ICTconf/OE_CD_Selwyn_final.pdf)
- [3] Grabe & Grabe. Integrating technology for meaningful learning. USA: Houghton Mifflin, 2005.
- [4] Melor MD YUNUS et al, MAIMUN AQSHA LUBIS, CHUA PEI LIN. Language learning via ICT: Uses, Challenges and Issues, WSEAS TRANSACTIONS on INFORMATION SCIENCE and APPLICATIONS, Issue 9, vol. 6, September, pp.1453-1467, 2009