

## **The Perception of Teachers in Using Computer-Based Technology at Higher Education**

By

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### **Abstract**

*Computer-based education is a type of education in which the students learn by carrying out special training programs on computer. Computer-based technology is an interactive instructional approach in which the computer, taking the place of an instructor. For some people CBT is equivalent to program that provides self-paced student instruction, tests and learning feedback with very little or no feedback of teacher. The present study was designed to analyze the perception of teachers in using the CBT(Computer-based technology) at higher education and to get opinion about the application of CBT. The study was descriptive in nature therefore survey method was selected to collect the data, questionnaire was use as research tool to collect the data. The questionnaire was administered to the 100 teachers of The Islamia University of Bahawalpur. After collecting data it was analyzed by applying percentage. Mean score was calculated for overall level of agreement/disagreement for each statement. For mean score norm was 3.00. However level of agreement was different for each statement. On the basis of data analysis finding and conclusions were drawn and recommendations were made. It was recommended that teachers need more training and awareness about the use of computer-based technology. Proper computer-based learning tools might be provided for the betterment of teaching-learning process.*

**Keywords:** *Computer-based technology; teachers' perception; Higher Education.*

### **Introduction**

Computer-based learning provides financial economies for developing and delivering higher education programs and courses while at the same time supporting and encouraging effective and strong instructional strategies. Similarly, the WWW (world wide web) enables the development of complex information sources to support learning and facilitates student-centered instruction and learning (Becker & Dwyer, 1994).

Computer based technology is an interactive instructional approach in which the computer, taking the place of an instructor, provides a series of stimuli to the student ranging from questions to be answered to choices or decisions to be made. For some people CBT is equivalent to program that provides self-paced student instruction, tests and learning feedback with very little or no involvement by a teacher. Using the computer for training and

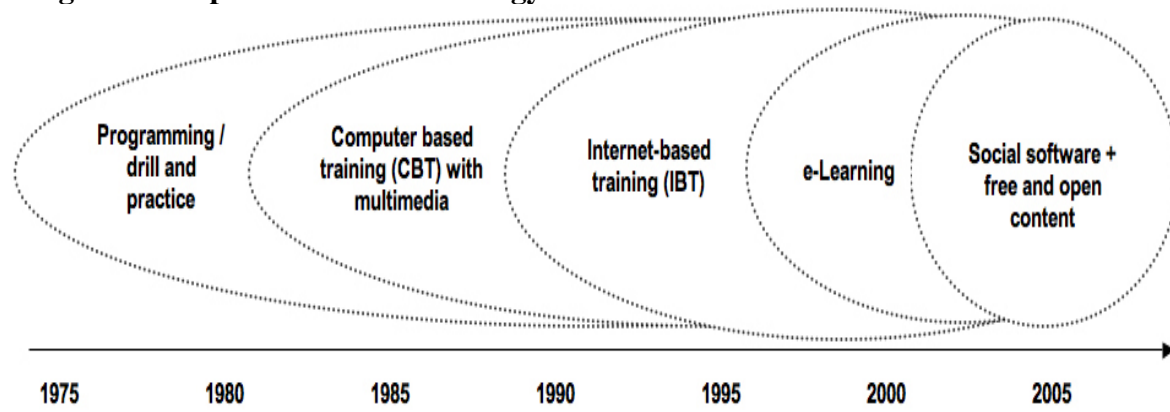
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instruction, CBT programs are called “course-ware” and provide interactive training sessions for all disciplines (computing.dcu.ie).

More or less synonymous terms of CBT are

- CAI – Computer-Aided Instructions
- CAI – Computer-Assisted Instructions
- CBI – Computer-Based Instructions
- CBT – Computer-Based Training
- CAL – Computer-Assisted Learning
- CALL – Computer-Assisted Language Learning
- WBI – Web-Based Instructions
- WBT – Web-Based Training(Oregon Network for Education).

### Origin of Computer-Based Technology



There are four major phases in the history of using computers in education. The fifth: the era of social software and free and open content is still to come. The phases are:

- (1) Late 1970's – early 1980's: programming, drill and practice.
- (2) Late 1980's – early 1990's: computer based training (CBT) with multimedia.
- (3) Early 1990's: Internet-based training (IBT).
- (4) Late 1990's – early 2000: e-Learning.
- (5) After 2000: the era of social software and free and open content is still to come. ([flosse.bloggning.fi](http://flosse.bloggning.fi))

Common practice divides the field of CBT/CBE into two sub fields; Computer-managed instruction (CMI) and Computer-assisted Instruction (CAI).

### Computer-Managed Instruction (CMI)

System in which a computer is used to manage several aspects of instruction, including learning assessment through administration of pretests and posttests; design and

preparation of learning prescriptions; and calculation, analysis, and storage of student scores. Computer-managed instruction is an instructional strategy whereby the computer is used to provide learning objectives, learning resources, and assessment of learner performance. Computer-managed instruction (CMI) aids the instructor in instructional management without actually doing the teaching ([wiki.answers.com/Q/What is computer managed instruction](http://wiki.answers.com/Q/What_is_computer_managed_instruction)).

### **Computer-Assisted Instruction (CAI)**

Computer-assisted instruction (CAI) is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place. It uses a combination of text, graphics, sound and video in the learning process. It is especially useful in distance learning situations. CAI programs use tutorials, drill and practice, simulation, and problem solving approaches to present topics, and they test the student's understanding. These programs let students progress at their own pace, assisting them in learning the material ([eprints.hec.gov.pk/350/](http://eprints.hec.gov.pk/350/)).

### **Computer-Based Learning Tools**

Sharp, (2005, pp. 172-291) described the programs for CBL which can be written in variety of modes. These modes are given below:

*Tutorial:* The tutorial presents information, asks questions, and makes decisions based on the student's responses. Like a good teacher, computer decides whether to move on to new material, review past information, or provide remediation. The computer can serve as the teacher's assistant by helping the learner with special needs. In the tutorial mode, new concepts are presented followed by questions. An incorrect answer will lead to backward recycling.

*Simulation:* In simulation programs, students can experience real-life situations without having to risk the consequences of failure. Students can experiment with dangerous chemicals on the computer screen, for example, and not to be in danger from the actual chemical. Simulation or role-playing games allow students to investigate relationships in real-life situations.

*Drill & Practice:* In drill & practice program the computer displays a problem, the student responds, and the computer provides an immediate feedback. This software differs from tutorial software in a key way: It helps students remember and utilize skills have previously been taught, whereas a tutorial teaches new material. The drill & practice mode assumes that the skill in question is known but that repetition is necessary to master the skill. Drill & practice is particularly helpful in subjects like mathematics, spelling, and foreign language.

*Multimedia:* Multimedia is not a new concept. For years teachers have made presentations using different kinds of media. Traditionally, they have used slides, movies, cassette players, and overhead projectors to enrich lessons. Now, however, teachers have personal computers and hard disk storage to combine these different media sources in their teaching. A computer-based method of presenting information, multimedia emphasizes interactively (Pfaffenberger, 2003).

*Internet:* The internet is a large network that links smaller computer networks in more than hundred countries. Having access to the internet means that you can tap into thousands of databases and talk electronically with experts worldwide on any known subjects. You can find jobs, communicate with teachers for educational planning, work out technical problems, sell products, conduct research, and find medical articles. (Sharp, 2005, p.291)

### **Influence of CBT on Teacher**

Teachers have reacted both positively and negatively to computer-based technology. Some of the positive reactions have resulted from: (1) exploiting the potential of interactive technology, (2) changing teaching style, (3) assisting classroom management, and (4) having greater feelings of self-worth (Baker, Gearhart, & Herman, 1990; OTA, 1988; Sheingold & Hadley, 1990).

Computers have the potential to help students to solve problems, think for themselves, and collaborate with others (OTA, 1988). The computer's potential also influences and changes the way teachers teach. Computer-based technology allows teachers to move from the role of dispenser of knowledge to a facilitator or coach, allowing the teacher to encourage and guide students in becoming active learners. David (1991, p.39) stated, "Teaching must change from dispensing information and rewarding right answers to creating activities that engage students' minds and present complex problems with multiple solutions." Spending more time with individual students was also cited as a reason for teachers to exploit the computer's potential. Computer-based technology also permitted the teacher to present more complex material and expect more from the students (OTA, 1988). There are several perceptions by teachers in the use of computer-based technology that seem to be significant:

- Technology will support superior forms of learning (Means, Blando, Olson, Morocco, Remz, & Zorfass, 1993),
- Computer-based technology can change the way teaching/learning occurs (OTA, 1988, 1995; Sheingold & Hadley, 1990),
- Computer-based technology helps teacher to accomplish things that they cannot do by themselves (Albright & Graf, 1992),

- Computer-based technology enhances teacher/student productivity (OTA, 1988; Sheingold& Hadley, 1990),
- Computer-based technology prepares students for the work world (Albright & Graf, 1992).

Teachers who hold these perceptions tend to be the most successful in adopting and using computer-based technology. The perception that technology will support superior forms of learning comes from cognitive psychology. Means, Blando, Olson, Middleton, Morocco, Remz, and Zorfass (1993) conclude that advance skills of comprehension, reasoning, comprehension, and experimentation are acquired through the learners' interaction with content.

By reviewing the related literature, some researches related to the topic came into account. Brief discussion of these researches is given here. A doctorate's level study on the Factors Which Influence Teachers' Use of Computer-based Technology was done by Jaber (1997). The purpose of this study is to provide school administrators with data to help them make more informed decisions on the placement of computers and appropriate teacher training and support for use of computer-based technology for instruction in public schools, more up-to-date information on the current computer-based technology uses today and the information which will give educators an understanding of what influences teachers to use computer-based technology. Based on the population size of 1017, the sample size needed to be a minimum of 278. One in three was selected which resulted in a sample size of 339. The two school systems provided a list of all teachers in their county. The survey instrument was developed based on the review of the literature, interviews, and existing surveys. The results showed that teachers received most of their training from their peers (86%) and by being self-taught (80%). Teachers also reported that continuous training was preferred for future training. Teachers reported spending 30 minutes or less daily to use computers for instructional purposes (scholar.lib.vt.edu).

Another study about the Effectiveness of Technology in School was made by Bialo and Sivin-Kachala (1996). The aim of this study is to measure the effects of technology on students' achievement, their self-concept and attitudes about learning and effects on interactions involving teachers and students in the learning environment. A sample of 176 schools were chosen randomly from both country side and city. It was a survey type study. The survey instrument was constructed on the base of previous researches and consisted of questionnaire and interviews of both teachers and students. The results showed that introducing technology into the learning environment has been shown to make learning more student-centered, to encourage cooperative learning, and to stimulate increased teacher/student interaction. Courses for which computer-based networks were used increased student-student and student-teacher interaction, increased student-teacher interaction with

lower-performing students, and did not decrease the traditional forms of communication used (www.ala.org).

Another research conducted by Serin (2010) to measure the effects of the computer-based instruction on the achievement and problem solving skills of the science and technology students. The objectives of this study were to investigate the effects of the computer-based instruction on the achievements and problem solving skills of the science and technology students. This was a study based on the pre-test/post-test control group design. The participants of the study consisted of 26 in the experimental group and 26 in the control group. The experimental group received the computer-based science and technology instruction three hours a week during three weeks. In the analyses of data, the independent groups t-test was used at the outset of the study to find out the whether the levels of the two groups were equivalent in terms of their achievements and problem solving skills and the Kolmogorov-Smirnov single sample test to find out whether the data follow a normal distribution and finally, the covariance analysis to evaluate the efficacy of the experimental process. The results of the research indicated that the use of the interactive learning package assisted the learners in increasing their achievements and developing their problem solving skills in the fifth year science and technology course (www.tojet.net).

The introduction of computer in education is not quick and easy path but in the developing countries like Pakistan it can be hardly afforded to ignore its importance in education, a more comprehensive plan is needed to be developed to give the practical knowledge of basic skills to operate the equipment, ability to design and prepare software etc to the maximum number of teachers.

### **Objective of the Study**

- To analyze the perception of teachers about the application of Computer-based learning tools at higher education.
- To find out the problems of teachers in using computer-based learning tools in their classes.
- To provide some guidelines for the betterment and development of teaching at higher education with the use of Computer-based technology.

### **Method and Procedure**

This study was descriptive in nature. A five point rating scale questionnaire was developed to collect the data. The questionnaire consisted of 19 closed ended and 2 open ended questions. The questionnaire was developed keeping in view the objectives and then checked by eminent teachers. Necessary amendments were done under their suggestions. The intended target population was all the teachers (male and female) of faculty of Education,

faculty of Science, faculty of Islamic Learning, faculty of Arts and faculty of management sciences of The Islamia University of Bahawalpur. Out of whole population, hundred teachers were selected through simple random sampling. The questionnaire was distributed among the teachers by approaching them personally. They were given enough time to fill the questionnaire. So the return rate of questionnaire was 100%.

### Analysis of Data

The data collected through questionnaire was analyzed by using Statistical Package for Social Sciences (SPSS) software. After collecting data it was analyzed by applying percentage. Mean score was calculated for overall level of agreement/disagreement for each statement. For mean score norm was 3.00. However level of agreement was different for each statement. Frequency and percentage of respondents were calculated and presented in tabular form.

Statement	SA	A	UNC	DA	SDA	Mean score
Computer-based learning may be the part of curriculum.	17.1%	56.4%	4.3%	4.3%	3.4%	3.93
Computer helps in teacher's instructions.	32.5%	50.4%	0.9%	0.9%	0.9%	4.32
Computer-based learning tools help in self learning of students.	27.4%	55.6%	1.7%	0%	0.9%	4.27
Better way of learning is to allow students to move at their own pace.	12.8%	55.6%	6.8%	7.7%	1.7%	3.83
Computer-based learning tools can be replacement of human teacher.	14.5%	23.9%	5.1%	32.5%	9.4%	3.02
Computer-based learning tools were more appropriate to meet the student's requirements.	10.3%	58.1%	5.1%	10.3%	1.7%	3.76
Learning through projects and slides is more intensive than learning through boards and charts.	12.8%	56.4%	3.4%	12.0%	0.9%	3.80
Computer-based learning helps in understanding the complex concepts of the subject.	17.9%	60.7%	3.4%	2.6%	0.9%	4.08
Computer-based learning tools were more helpful at higher level.	17.1%	55.6%	8.5%	3.4%	0.9%	3.99
Computer-based learning tools were more useful to develop cognitive skills in certain type of contents.	12.0%	59.8%	5.1%	8.5%	0%	3.88

Computer-based learning tools cannot be helpful for all kind of students.	9.4%	58.1%	4.3%	12.0%	1.7%	3.72
Computer-based learning tools play an important role to improve problem-solving skills.	12.8%	56.4%	8.5%	7.7%	0%	3.87
Computer-based learning tools required less time and energy of teachers.	15.4%	53.8%	6.0%	8.5%	1.7%	3.85
There is no difference in teacher's perception in using computer-based instructions and traditional instructions.	3.4%	20.5%	8.5%	47.0%	6.0%	2.63
Computer-based learning is helpful in development of competence.	12.0%	65.0%	5.1%	1.7%	1.7%	3.98
Teachers feel comfortable in using various computer-based learning tools like multimedia.	13.7%	63.2%	1.7%	5.1%	1.7%	3.96
You are using computer-based learning tools regularly in classes.	6.8%	17.9%	6.8%	47.9%	6.0%	2.67
Computer-based learning tools waste the time of students.	2.6%	12.8%	11.1%	52.1%	6.8%	2.44
All computer-based learning tools are available in your department.	10.3%	12.8%	3.4%	48.7%	10.3%	2.58

### Responses to the open ended questions

- Majority of respondents stated that major problem in using CBL tools is unawareness of computer knowledge. Proper CBL tools are not available in department and if some tools are there, it is not allowed to use these tools daily in lectures. There are no any refresher courses that teach how to use CBL tools. Because of this teacher do not know the use of modern tools. Electricity problem is the major issue in using computer-based learning tools. Some respondents stated that there is no space of use of CBL tools in their curriculum.
- Majority of respondents had suggestions that refresher courses should be held to train teachers about CBL tools. For proper awareness of computer based learning, there must be good contents about CBL included in curriculum. Budget for computer-based education should be provided. All CBL tools should be available in departments.

### Findings



- 53.0% of respondent were disagreed with the statement that there is no difference in teacher's perception in using computer-based instructions and traditional instructions. The mean value is 2.63.
- A mean value 4.32 shows that respondents agreed with the statement that computer helps in teacher's instruction. Percentage is 82.9%
- A mean value 4.27 shows that respondents agreed with the statement that computer-based learning tools help in self learning of students. Percentage of agreed respondents is 83.0%
- 68.4% of respondent agreed with the statement that better way of learning is to allow students to move at their own pace. The mean value is 3.83.
- 41.9% of respondent disagreed with the statement that Computer-based learning tools can be replacement of human teacher. The mean value is 3.02.
- 68.4% of respondent agreed with the statement that Computer-based learning tools are more appropriate to meet the student's requirements. The mean value is 3.76.
- 69.2% of respondent agreed with the statement that learning through projects and slide is more intensive than learning through boards and charts. The mean value is 3.80.
- A mean value 4.08 showed that respondents agreed with the statement that computer-based learning helps in understanding the complex concepts of subject. Percentage of agreed respondents is 78.6%.
- 72.7% of respondent agreed with the statement that computer-based learning tools are more helpful at higher level. The mean value is 3.99.
- 71.8% of respondent agreed with the statement that Computer-based learning tools are more useful to develop cognitive skills in certain type of contents. The mean value is 3.88.
- 67.5% of respondent agreed with the statement that computer-based learning tools cannot be helpful for all kind of students. The mean value is 3.72.
- 69.2% of respondent agreed with the statement that computer-based learning tools play an important role to improve problem-solving skills. The mean value is 3.87.
- 69.2% of respondent agreed with the statement that Computer-based learning tools required less time and energy of teachers. The mean value is 3.85.
- 77.0% of respondent agreed with the statement that computer-based learning is helpful in development of competence. The mean value is 3.98.
- 76.9% of respondent agreed with the statement that teachers feel comfortable in using various computer-based learning tools like multimedia. The mean value is 3.96.
- 73.5% of respondent agreed with the statement that computer-based learning may be the part of curriculum. The mean value is 3.93.
- 53.9% of respondent disagreed with the statement that you are using computer-based learning tools regularly in classes. The mean value is 2.67.

- A mean value 2.44 shows that respondents disagreed with the statement that computer-based learning tools waste the time of students. Percentage of disagreed respondents is 58.9%.
- 59.0% of respondent disagreed with the statement that all computer-based learning tools are available in your department. The mean value is 2.58.

### **Conclusions and Discussion**

- Majority of respondent agreed that computer helps in teacher's instruction, in understanding the complex concepts of subject and to improve the level of learning. Also computer-based learning tools help in self learning of students and more useful to develop cognitive skills in certain type of contents but it cannot be helpful for all kind of students.
- Majority of respondent agreed that the better way of learning is to allow students to move at their own pace and learning through projects and slides is more intensive than learning through boards and charts.
- Majority of respondent agreed that Computer-based learning tools are more appropriate to meet the student's requirements. It plays an important role to improve problem-solving skills and in the development of competence therefore it should be part of curriculum.
- Majority of respondents agreed that it requires less time and energy of teachers and teachers feel comfortable in using various computer-based learning tools like multimedia.
- Majority of respondent disagreed that Computer-based learning tools can be replacement of human teacher. A role of human teacher cannot be ignored in the learning process. Computer-based learning tools can be assistant of teacher but cannot play role of human teacher.
- Majority of respondent disagreed that there is no difference in teacher's perception in using computer-based instructions and traditional instructions. It is obvious that performance of teacher must be better when using computer-based learning tools because these tools requires less time to convey more knowledge .
- Majority of respondent disagreed that they are using computer-based learning tools regularly in classes because all computer-based learning tools are available in their department.
- Majority of respondent disagreed with the statement that computer-based learning tools waste the time of students.

### **Recommendations**

As teacher's perception is positive in using Computer-based technology, so it is recommended to counteract the problem that

1. Teachers of higher education might be facilitated for the provision of CBT.
2. Refresher course might be conducted for teachers to give them proper awareness of computer education.
3. Proper CBL tools might be provided for daily use in lecture.
4. Computer-based learning might be the part of curriculum.
5. The problem of electricity shortage is the main hurdle in promoting computer-based technologies so it is recommended that generators might be provided to departments.
6. The further study may be conducted on the effect of use of computer-based learning technologies on learning procedure of different type of students.

## References

- Albright, M.J., & Graf, D.L. (Eds.) (1992). *Teaching in the information age: The role of educational technology*. San Francisco: Jossey-Bass Publishers.
- Becker, D., & Dwyer, M. (1994). Using hypermedia to provide learner control. *Journal of Educational Multimedia and Hypermedia*, 3(2), 155-172.
- Bialo, R. E. & Sivin-Kachala, J., (1996), The effectiveness of Technology in Schools, *American Association of School Librarians*, volume 25, Number 1 retrieved on 18/09/11 from <http://www.ala.org>
- David, J. L. (1991). *Restructuring and technology: Partners in change*. Phi Delta Kappan, Digital's courseware Authoring System, (1984) "introduction to computer Based Education."
- Dwyer, D., Ringstaff, C., & Sandholtz, J. (1991). *Changes in teachers' beliefs and practices in technology-rich classrooms*. Educational Leadership.
- Jabber, E.W., (1997), A survey of factors which influence teacher's use of computer based technologies, *scholar.lib.vt.edu*, 71997-02347, retrieved on 2/09/11 from <http://scholar.lib.vt.edu>
- Means, B., Blando, J., Olson, K., Morocco, C., Remz, A. and Zorfass, J. (1993). *Using technology to support education reform*. (Office of Educational Research and Improvement), Washington, DC: Department of Education.
- Pfaffenberger, B. (2003). *Computers in Your Future*. New Jersey: prentice Hall.
- Serin, O., (2010), The effects of the computer-based instruction on the achievement and problem solving skills of the science and technology students, *The Turkish Online Journal of Education (TOJET)*, volume 10 Issue 1. Retrieved on 12/09/11 from <http://www.tojet.net>

Sharp, V. (2005). *Computer Education for Teachers*. New York. McGraw-Hill.

Sheingold, K. & Hadley, M. (1990). *Accomplished Teachers: Integrating Computers into Classroom Practice*. New York: BankStreetCollege of Education.

U. S. Congress, Office of Technology Assessment. (1988). *Power On! New Tools for Teaching and Learning*. (Report No. IR 013574) Washington, DC: Office of Technology Assessment (ERIC Document Reproduction Service No. ED 295 677).ego, CA: EdITS Publishers.

Computer-based training retrieved on 17/07/11 from

[http://edutechwiki.unige.ch/en/Computer-based\\_training\(oregon network of education\)](http://edutechwiki.unige.ch/en/Computer-based_training(oregon_network_of_education))

<http://flosse.bloggning.fi/2005/06/23/critical-history-of-ict-in-education-and-where-we-are-heading/> retrieved on 25/8/11

[http://www.wiki.answers.com/Q/What\\_is\\_computer\\_managed\\_instruction](http://www.wiki.answers.com/Q/What_is_computer_managed_instruction) retrieved on 10/09/11

<http://www.eprints.hec.gov.pk/350> retrieved on 15/08/11

<http://www.computing.dcu.ie/~mward/mthesis/chapter2.pdf> (retrieved on 16/07/11)