

ICT in Higher Education – A Study

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***Abstract:* Information is growing at an exponential rate and in a variety of formats, especially the digital media. The present age is called as “Era of Information Technology”. IT represents a significant factor in the rapidly changing relationship between user and information. It is well recognized that Information and Communication Technology (ICT) has immense plausible potential for the structural growth of a country. The new information and communication technologies of Internet and multimedia have revolutionized the field of education. Communication is the basic to all communication between teacher and student, between institution and government and between peers. In education 87% of information enters our brain through eyes, 9% by ears and 4% via other senses. So visual aids gain much attention of students more than verbal teaching. The future trends of internet and multimedia will influence and change the traditional methods of teaching and learning and enlarge the sphere of dissemination of knowledge and information. The demand of computer technology in education and training has enhanced the ability of quality education in various educational organizations and training institutes. Educators strongly feel that ICT is the most valuable tool to overcome the problem of illiteracy. Academics are now being challenged by the rapidly growing new information technologies of multimedia, internet, WWW and other virtual computer technologies, which demands changes in the styles, attitudes and skill towards information handling. This paper presents the results of the study conducted on the impact of ICT for teaching learning process in our college and the assessment in using the developed CAI package by the students and faculty of the selected five colleges in Tamil Nadu.**

I Introduction

Information and communication technologies (ICT) have become commonplace entities in all aspects of life. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavour within business and governance. Within education, ICT has begun to have a presence but the impact has not been as extensive as in other fields. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners. The use of ICT in education lends itself to more student-centered learning settings. With the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important.

There have been a number of factors impeding the wholesale uptake of ICT in education across all sectors. These have included such factors as lack of funding to support the purchase of the technology, a lack of training among established teaching practitioners, a lack of motivation and need among teachers to adopt ICT as teaching tools. But in recent times, factors have emerged which have strengthened and encouraged moves to adopt ICTs into classrooms and learning settings. These have included a growing need to explore efficiencies in terms of program delivery, the opportunities for flexible delivery provided by ICTs, the capacity of technology to provide support for customized educational programs to meet the needs of individual learners and the growing use of the Internet and WWW as tools for information access and communication. This paper seeks to explore the likely changes in education as ICT acts as a powerful agent to change many of the educational practices to which we have become accustomed. In particular, the paper explores the impact of ICT in teaching learning process in our college and the assessment in using the developed CAI package by the students and staff of the selected five colleges in Tamil Nadu.

II Implementation of ICT

Experiential learning with the help of modern ICT is both encouraged and required as part of the self-learning processes. This paper first presents the information on usage of ICT in our institution and next the assessment of using the CAI package by the staff and students of five colleges in Tamil Nadu

i) Use of ICT in various facets of teaching and learning

The usage of ICT in our institution TBAK College for Women was analyzed. The college offers 10 UG and 5 PG programmes with the student strength of 1392. ICT is predominantly used in teaching and learning process for all the courses offered. Information on curricular strategies, Curricular-Transactional Strategies and use of ICT and nature and purpose of use by the students and faculty was collected from the 25% randomly selected samples of the total strength with the help of specially designed questionnaire and the results of the same are discussed.

ii) Assessment of the developed CAI package

Initially CAI packages were used as a module of ICT to enhance retention of concepts and theories taught to students. Two packages were developed one for teaching Dietetics and the other was for teaching C-Programming. The developed package was assessed for adequacy and usability.

Selection of Sample:

A total of 200 Students and 50 Lecturers from five Arts and Science colleges offering Home Science and Computer Science with Dietetics and C-Programming as a paper in their syllabus was selected for the study. Information regarding need for CAI, advantage of CAI, computer availability, number of computer literate and chapters in the two papers that demand additional teaching tool etc was collected from the lectures handling the paper from the selected five colleges using a questionnaire.

Development of the Interactive Package on Diabetes Mellitus and C-Programming:

From the survey need for CAI on Diabetes Mellitus and C-programming was understood. The CAI was developed with four main aspects:

- Conceptualizing the contents
- Designing it for software presentation
- Selection of appropriate system and packages
- Integration of multimedia effects and effective presentation and comprehension.

Framing the Script for Software Presentation:

Relevant information's were collected and classified. Table-1 list the contents in the CAI package — the chapters that are discussed in detail under the various headings

Table - 1 Contents of the CAI Package.

S.No	Diabetes Mellitus	C-Programming
1	Definition of Diabetes Mellitus	Introduction to C Programming
2	Overview of Diabetes Mellitus	Data types and Operators
3	Comparison of two types of Diabetes Mellitus	Input Output Statements
4	Risk Factors, metabolic Consequences and Symptoms	Decision Statements
5	Complications of Diabetes Mellitus	Loop Control Statements
6	Diagnosis of Diabetes Mellitus	Arrays, Strings and Standard Functions
7	Insulin	Pointers
8	Diet Management	Functions, Structures and Union
9	Case Studies	Storage Class and Preprocessor Directives
10	Drugs, Exercise, Training	Files
11	Glossary, Quiz, Puzzle and Games on Diabetes Mellitus	Glossary, Quiz, Puzzle and questions on C Programming

Designing the Contents for the Packages:

The Contents of the lessons were arranged frame by frame in sequential order. The layout of each frame was designed carefully giving attention to background style etc. Relevant pictures and animated images were also included. The hyperlinks were also decided. Apart from textual contents, games and puzzle were included. Scoring pattern for the games and interactive messages were included in the packages.

Selection of System and Package Tool:

Appropriate software and hardware were identified for the development of the interactive package and listed in table -2.

Table – 2 Lists of Hardware and Software Required

S No	Hardware	Software
1	P IV Processor	Windows XP
2	Multimedia System	Visual Basic 8
3	Accelerated Graphics	Adobe

	Processor Card	Photoshop 6
4	CD Writer	GIF Animator
5	-	Turbo C

Integration of the Multimedia Options Effects

The text matter was integrated with appropriate audio and visual effects for simultaneous presentation by mixing wave files containing background music and narration with respective frames. Timing for each frame was determined. Appropriate loops were provided within the frames and between the frames for smooth navigation. The final package was a set of dynamic slides with colourful text, pictures, background music narration, colourful graphics and animation.

Flow Chart on Development of packages

The general procedure for developing a CAI package is illustrated using the flow chart given in fig. 1

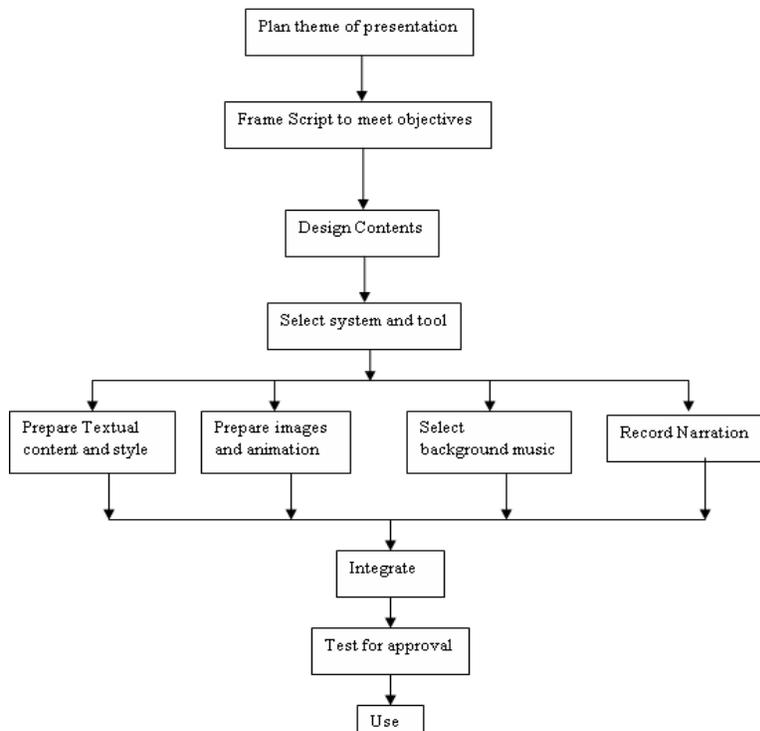


Fig 1 Flow Chart on Development of packages

Assessment of the Developed CAI package:

The developed CAI was given to the lecturers teaching dietetics and C-Programming of the selected colleges. The package was used by the lecturers for classroom teaching. After a period of 15 days, acceptability and adequacy of the packages, was collected from the lecturers and students using an opinionnaire. The data thus collected is statistically inferred.

III Results and Discussion

i) Use of ICT in Various Facets of Teaching and Learning

The results of the use of ICT in various facets of teaching and learning in our institution are detailed. Both curriculum and curricular-transactional strategies emphasize ICT in order to recognize the learner's ability to use modern educational technology.

Curricular Strategies:

- Computer literacy is a required module for every student of the college and it has been integrated into the curriculum for earning credits.
- The para-curriculum facilitates vocational modules in order to give learners additional input to reinforce basic literacy.
- Most programmes offered have built-in ICT modules for either acquiring computing knowledge or applying it for specific purposes.

Curricular-Transactional Strategies:

- The Choice-Based Credit System, which is actively used, ensures adequate freedom for learners to earn additional credits in ICT.
- Facilities offered for web-browsing (at least one hour a week for every student) and e-mail submission of assignments emphasizes the use of ICT.
- Use of LCD/PPT is facilitated by our Computer Aided Language Laboratory.
- The e-library is an additional facility.

- Outsourcing has given students the facility of “Virtual Classrooms”.

Use of ICT - nature and purpose of use by the students

ICT is used by all departments. Students are required to submit assignments online, use LCD/PPT for presentations at seminars and conferences, browse web sites for downloading materials for presentation and for class discussion. They also use e-mail to interact with all teaching members of the faculty who have e-mail ID of their own. Student projects are often prepared with the assistance of the Department of Computer Science.

Table – 3 Usage of ICT in TBAKC for teaching and learning

Use of ICT And Nature And Purpose Of Use	UG		PG		Additional Details
	Yes(No.)	%	Yes (No.)	%	
(A) On-Line Self-Learning	161/288	56	38/60	63	Frequency of use of computers one hour per student every working day
(B) On-Line Assessment	121/288	42	23/60	38	
(C) Web-Browsing	252/288	88	48/60	80	
(D) E-Mail For Interaction	151/288	52	19/60	32	
(E) PPT for Seminars	196/288	68	18/60	30	
(F)CAI	161/288	56	48/60	80	

The table-3 describes the extent of the use of ICT at TBAKC for the various facets of teaching and learning like on-line Self-learning; on-line assessment; web-browsing; e-mail; use for internal interaction; use of PPT and CAI package. The results are quite exciting. Opportunity to use ICT is extended to every student by the college by allotting one hour of computer time each working day. The following are some inferences drawn from the feedback.

- **Web-browsing** ranks first with 88% of UGs and 80% of PGs using it substantially.
- **On-line Self-learning** ranks second with 56% of UGs and 63% of PGs using ICT for their academic course-embedded assessments.
- Close on heels comes **e-mail** for internal interaction. 52% of UGs and 32% of PGs use e-mail. Most members of the college have their own e-mail ID.

- **On-line assessment** is practiced for the benefit of 42% of UGs and 38% of PGs. This is understandable because PGs have fewer opportunities to use objective-type assessments.

On the whole statistics proves that an average of 60% of UGs and 49% of PGs have effectively used ICT for acquisition of knowledge.

Use of ICT - the nature and purpose of use by the faculty

Faculties enjoy free use of technology for preparing research papers and teaching materials. Table-4 depicts the optimal use of ICT by the faculty members of all the departments of the college for the preparation and delivery of lecture.

Table- 4 Optimal Use of ICT

S. No	Name of the Department	Use of ICT (05)
1	Department of Tamil	3.06
2	Department of English	3.8
3	Department of Arabic& Hindi	4.0
4	Department of Home Science	4.58
5	Department of Mathematics	4.2
6	Department of Microbiology	4.2
7	Department of Computer Science	4.1
8	Department of Chemistry	4.22
9	Department of Commerce	3.47
	College Average	3.96

TBAKC is more than a computer literate and is proved by the optimal use of ICT in both teaching and learning. The score of 3.96 (institutional average) for planning and delivery of instruction, speaks highly of the facility with which the faculty of college make class-room activities lively and effective with the use of ICT. The Computer Aided Instruction (CAI) package is a unique healthy practice of the college. The acquisition of skills in the use of technology by learners has earned them good placement in multi-national companies.

MATCH

1. Type 1 Diabetes
2. Polyuria
3. Glucagon
4. Mellitus
5. Insulin
6. Foot Ulcer
7. Beta hydroxy butyrate
8. Insulin reaction
9. Fibre Diet
10. Aspartame

<input type="checkbox"/>	a. Helps glucose to enter the cells
<input type="checkbox"/>	b. because of neuropathy
<input type="checkbox"/>	c. Ketone body
<input type="checkbox"/>	d. Artificial sweetner
<input type="checkbox"/>	e. Helps to lower cholesterol in diabetic patients
<input type="checkbox"/>	f. Hypoglycemia due to too much insulin
<input type="checkbox"/>	g. Juvenile diabetes
<input type="checkbox"/>	h. Latin word
<input type="checkbox"/>	i. Excess urination
<input type="checkbox"/>	j. Secretion of alpha cells of pancreas

Your Score is

Self Check CROSSWORD

ACROSS

1. Glucose seen in urine is called _____ (10)
6. Should be avoided by diabetic patients (6)
7. _____ infection is often seen in diabetic patients (4)
10. Beta Hydroxy butyrate is a _____ (6)
13. Diabetes can be controlled by strict _____ management (4)
14. Type 1 diabetes is also called _____ (4)
15. Uncontrolled diabetes leads to coma and _____ (6)
16. Viral infection like _____ causes beta cell destruction (5)
17. When lipid levels in the blood are high it is called _____ (5)
18. _____ acts as both hypochloretrolemic and hypoglycemic agent

DOWN

1. Excess glucose in the body is stored as _____ (8)
2. Neuropathy finally leads to the amputation of the _____ (3)
3. A diabetic subject mostly test his/her _____ for glucose levels (5)
4. Beta cells of pancreas produce _____ (7)
5. The onset of diabetes is _____ (6)
8. _____ part of the eye is affected due to diabetes (6)
9. The most common test done by diabetes patients is _____ (3)
10. Renal is a term referred to _____ (6)
11. Type 2 diabetes is also called _____ (6)
12. When diabetes is seen in pregnant women it is called _____ (3)

Plate – III Puzzle

Plate – IV Puzzle

Assessment of the CAI by the faculties selected from five colleges:

Overall acceptability of the developed packages

The table-5 depicts the responses received from the lecturers of the selected five colleges. 37 respondents informed that the CAI was most useful, 28 informed it to be handy and 42 of them opinioned it to be good. The increasing friendliness, power and declining cost of computers are a viable signs indicating that CAI will be adopted for quality learning and skills even in developing countries like India.

Table – 5 Responses received from the lecturers of the selected five colleges after using the developed package.

Response from lecturers	Usefulness of details included		Features of the CAI package on Diabetes Mellitus and C-Programming				Opinions about the CAI packages		
	Most useful	Useless	Handy	Informative	Attractive	Easy to Use	Good	Fair	Has to be improved
N=50	37	13	28	20	20	5	42	-	8

Assessment of the CAI by the students selected from five colleges:

Overall acceptability of the developed packages

The selected students were requested to fill upon questionnaires designed to evaluate the adequacy of the programme.

Table - 6 Views of the students samples regarding the developed packages.

S.No	Views	Responses N=200	
		Yes	No
1	Programme is interesting and easy to use	200	-
2	Programme contents easy to understand	175	25
3	Programme is interactive	192	8
4	Programme gives useful information	200	-
5	Pictures, Animations and music make programme interesting	185	15
6	Games are easy, interactive and useful	200	-
7	Duration of the programme satisfactory	160	40

The table-6 indicates the views of the subjects regarding the developed package. All the samples unanimously reported the programme to be interesting, easy to use, and provide useful information. 185 samples reported that the pictures, music and animations made the package interesting and narration helped to learn better as it reinforced that it was interactive. The time frame of the developed CAI envisaged was one hour for DM and 4 hours for CProgramming. Except 40, rest of the students' opined that the duration of the programme was satisfactory as the speed of usage could be self paced.

The above observation evidence the fact that the developed packages have been successful and acceptable among lecturers and students. The use of computer conferences and interactive television can expand the reach of education. The learners can access information regardless of place and time. The level of interactivity among instructors and learners increases due to the ease of use of the learning system.

IV Conclusion

As we move into the 21st century, many factors are bringing strong forces to bear on the adoption of ICTs in education and contemporary trends suggest we will soon see large

scale changes in the way education is planned and delivered as a consequence of the opportunities and affordances of ICT. Conventional teaching has emphasized content. For many years course have been written around textbooks. Teachers have taught through lectures and presentations interspersed with tutorials and learning activities designed to consolidate and rehearse the content. Contemporary settings are now favouring curricula that promote competency and performance. Curricula are starting to emphasize capabilities and to be concerned more with *how* the information will be used than with *what* the information is. This paper has explored the likely changes we will see in education as ICT acts as a powerful agent to change many of the educational practices to which we have become accustomed.

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