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TOWARDS TECHNOLOGICAL ERA: POTENTIAL OF CURRICULUM OF COMPUTER SCIENCES AT SECONDARY LEVEL IN PAKISTAN

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ABSTRACT

Twenty first century is known as the century of technologies, making lives easier and more comfortable. Now, one can check his/her bank balance, pay utility bills and can have updates with the help of technology. One can check the environmental changes and can take safety measures through technology. Computer is the most wonderful technology which has provided incredible services to the human beings. Advanced nations have done tremendous attainments in all fields of life with the use of computer. Computer education is becoming essential for smart work in the market place. Government of Pakistan has introduced computer education at school level with the aim to prepare the young generation for working in the technological era. The objectives of the study were (i) to find the opinion of teachers about the applications of computer in technological era (ii) to find the opinion of the teachers about the potential of computer sciences taught at secondary level. A questionnaire was developed for knowing the opinion of the teachers about computer education. Each statement of the questionnaire was checked on significance level 0.05 by suing chi square technique. It was found that computer has made our work smart and its education is essential for work place. Teaching of computer sciences at school level enable the students to learn its basic concepts and move towards higher education with prior knowledge.

Key Words: School Education, Technology, Computer Education.

1. INTRODUCTION

Beginning of twenty first century brings unbelievable happenings in the history of mankind. Now, one can have approach over a huge volume of knowledge and repository over the world and this credible approach is due to the technologies. The term technology implies the application of science to art. When we apply the science of learning and communication to teaching we evolve a technology (Singh, 2005). According to Kumar (2006, p.2) technology is sign to the techniques as well as the technical invention. A methodical way of applying the techniques to achieve an objective is as important as the use of technical equipment for the same.

Computer is one of the wonderful inventions in the history of mankind. On one hand, computer gives ease and relieve in many fields of life to human beings and on other hand, it gives beauty and new styles to old patterns. At present, more or less all fields are decorated with computer; computer is in action from agricultural field to space technology and is bringing multiple benefits for mankind. Even, computer technology is considered a criterion for development. A computer has capacity to absorb hundreds of thousands volumes of books, pictures, audios and videos in its memory, which one can retrieve at any time. No doubt, computer enables the human beings to manage life patterns in different suitable fashions and can watch the events occurring in any part of the world. The computer is causing a change in society that is comparable to the change occasioned by the industrial revolution (Johnson, 2009). Around the globe, computer skill is becoming an obligatory for working with new technological equipments and in advanced countries; computer education is compulsory element in the education system.

Pakistan is one of the countries which are making rapid growth in the use of computer. Pakistan has launched online system in many governmental institutions for facilitating its citizens. Economic Survey of Pakistan (2011, p. 183) states that Pakistan Telecommunication Authority (PTA), has provided access to Information and Communication Technology (ICT) which resulted into an open, technologically advanced, widespread and business friendly broadband market depicting remarkable growth rates over the years. Induction of computer in offices, and markets demands such people who should have strong grip over working with computer.

Currently, computer education is a compulsory subject in the professional degree programs and it is kept in the arts and humanities group, because without computer skill, one would face many troubles in the actual work place. Government of Pakistan realizes the importance of computer education for its youth, and has introduced computer science as a subject at school level. In the school curriculum, computer science is an elective subject from grade 6 to grade 8. The main aim of teaching computer science at school level was to create awareness about the computer usage at low level and to introduce the students with the basics of computer for further learning. At secondary level, government of Pakistan introduces computer science as a subject in the science stream against biology. The aim of secondary education is to prepare students for life and work place and majority of the students leave education after this level. At secondary level, teaching of computer science is for two purposes, first, to train the students with basic use of computer so that the students who leave education must be able to do some basic work such as data entry and manage data on computer, secondly, to train students for the use of computer in higher learning. There are some common perceptions about computer in the curriculum. Firstly, it is a common view of teachers, parents and students that students have more opportunities to learn computer at home and school, which enable them to understand the computer phenomenon more appropriately. Secondly, parents think that this is the technological era and computer is everywhere, so learning of computer is more beneficial for the children. Apart from these perceptions, there is an argument relevant to selection of computer education that computer education is more mathematical and which is working behind the technologies and hence computer science is valuable for the students for entering into sophisticated professions.

Government of Pakistan is providing many facilities through technology including, access to national and international information, instant money transfer and bill payments etc. A large number of private and governmental institutions are offering "online" system to its customers. The main aim of teaching computer science at school level is to produce such students who have knowledge of computer and may enjoy these facilities smartly.

2. Literature

Technology is in action all around us in different forms, at one place it is in the form of radio, television or multimedia and at the other place in the form of computer. In all its forms, it is serving the mankind. Throughout human history, technology breakthroughs and new social forms have combined, each influencing the other to create new ways of life that spread throughout the human species (Manjulika & Reddy, 2006). Technology is critical to preparing students to live, learn and work successfully in a digital age (Siddique, 2004). Aggarwal (1995,) states that

Technology has two aspects, i.e. technology as things and technology as social process. Technology as things is the use of scientific knowledge to practical works by organization which involve in 2 Ms i.e. machinery men, while the technology of social process means the use of scientific and other organized knowledge to practical works by hierarchically ordered systems which include men machines. (pp.1, 2)

Singh (2005) write down that the Computer is the most significant contribution of man in the current century. In this era of technological advancement, computer education is considered to be an essential ingredient of education (Johnson, 2009). Jain (2005) states that today, computing power are no longer a limitation for implementation of learning tools. The problem has moved from how to implement to what tools to implement and why. Salim (2007) conducted a study entitled "Computer Education at Secondary Level" about the computer education in the schools, one of the respondents suggests that "It would be better to announce the subject as a compulsory one with the objective of providing the students with quality teaching and practical orientation on information technology". The information superhighway as a result of convergence of telephones, computers and television technologies has opened new vistas and access to knowledge (Isani & Virk, 2005). Siddique (2004, p.4) pointed out that computers are envisioned as ways to empower "technology by telling" and "learning by listening" serving as a fire hose to spray information from the Internet into learner's mind.

Mahmood (2009) conducted a study in context of Pakistan about Gender, subject and degree differences in university students' access, use and attitudes toward information and communication technology (ICT). There were 625 respondents in the study and found that large majority of the respondents have access to computers at home (73%) and university (72%). Students from science & technology (76%) and social sciences (75%) departments have significantly more computer access at university than students from arts & humanities departments (48%).

Abbas (2006) states:

Computer Science not only covers electronic data processing but also prepares students for problem solving through the exposure to the BASIC programming language. However the subject of Computer Science has now been found to cater best to the needs of students with mathematical aptitude. Industries require competent computer users rather than computer programmers skilled in an obsolete language.

National Education Policy (1998-2010, p.90-92) states that computer technology has the fastest rate of return and documented the following steps regarding computer education in its policy provisions:

- Computer will be introduced in secondary schools.
- School curricula will be aligned toward recent developments in information technology such as software development and the information super highway and designing Web Pages, etc.
- Educational institutions will be provided Internet facilities.
- The subject of computer education/science will be introduced at higher secondary and degree levels in phased manner.
- Computer education will be made compulsory component for all training programs in the education sector.

The National Curriculum of Computer Education for VI-VIII (2007) states the following three goals of teaching computer science:

- Computer and Information Literacy
- Productivity through technology
- Algorithmic thinking and problem solving

National Curriculum of Computer Science at the secondary (2000) acknowledged the following objectives of teaching Computer Science at the secondary level:

- Understand the basic concepts, theories, and laws of computer science and their applications.
- Develop mathematical manipulation skills for designing different language programs in Computer Science.
- Understand and appreciate the role of Information Technology in socio- economic and cultural development of society.
- Develop skills for using and promoting Internet techniques.
- Provide sound but solid basis for further studies in the discipline of Computer Science and Information Technology. (p.2)

3. Objectives of the Study

The objectives of the study were:

- To find the opinion of teachers about the applications of computer in technological era.
- To find the opinion of the teachers about the potential of computer sciences taught at secondary level.

4. Limitation of the Study

It was tried to explore the opinion of computer science teachers about the functions of computer sciences in technological era and the potential of the curriculum of computer sciences taught at secondary level in Pakistan but the sample for the study was 85 which is very small for this type of study. So it is suggested for others to use it with degree of concern.

5. Method and Material

5.1 Design of the Study and Sample

The study was descriptive in nature which was done through survey. Through purpose sampling technique, a total of 85 computer teachers were traced from Division Bahawalpur. The criteria for the selection of sample teachers was they must have master degree in computer sciences or having have post graduate diploma (PGD) in computer sciences with science background at graduation level.

5.2 Instrument Used

To achieve the objectives of the study, a questionnaire was developed on five point Likert scale (Strongly Agree, Agree, Uncertain, Disagree, Strongly Disagree). There were ten closed ended items in which the respondents were asked about the importance of applications of computer education in day to day life and the potential of curriculum of computer science at school level.

6. Data Analysis

Each statement of the questionnaire was tested on significance level 0.05 by using chi-square technique.

Item #	Statement	SA	A	UNC	DA	SDA	χ^2
1	Currently, computer makes work smarter,	29	45	11	0	0	90.71

	easy and attractive.						
2	Computer provides more opportunities to present one thing in different shapes/shades to attract others.	28	35	12	10	0	47.53
3	In the global scenario, computer skill is a tool for enjoying the other technological services.	26	51	8	0	0	111.53
4	Computer education helps in operating other technological equipments at work place.	27	45	13	0	0	86.94
5	Computer applications help in understanding the core ideas and foundations of many relevant fields and provide different dimensions to work.	35	48	5	0	0	118.06
6	At present, computer has become an essential part of work and its basic knowledge is necessary for young ones to join market.	46	35	4	0	0	112.47
7	Curriculum of computer sciences is aligned towards innovations in the field of information technology.	29	36	20	0	0	64.24
8	Curriculum of computer sciences of secondary level provides enough expertise and skills to work in the market.	18	35	11	15	6	28.59
9	Curriculum of computer sciences has potential to cater the needs of the students for advanced level education in computer science.	38	38	9	0	0	89.65
10	Curriculum of computer sciences introduces the students to relevant softwares in other computer based machines.	15	47	23	0	0	89.29

df=4

table value of χ^2 at 0.05 = 9.488

7. Discussion

The respondents of the study confirmed that computer makes work easy, smarter and create attractions; with computer we can present one thing in different shapes and shades. As in current era, computer is everywhere and computer education is necessary to enjoy the other technological services as it knowledge work as a tool to operate the other technological based machines. The respondents agreed that through computer applications one can understand the central ideas and foundations to clarify the relevant aspects. They also were of the opinion that computer has become an essential part of almost every field so its basic knowledge is necessary to work in the market. The respondents were of the opinion that curriculum of secondary level is aligned towards innovations in the field of information technology and provides enough expertise and skills to work in the market. The respondents agreed that curriculum of computer sciences has potential to cater the needs of those students who want to join computer stream in future. The respondents also agreed that curriculum of computer sciences introduce the students to relevant softwares in other computer based machines.

8. Findings

Computer provides us ease to present our work in a smart way. Computer knowledge is necessary for working in the today's market place. Computer works as a tool for enjoying other technological services. Through computer applications we can understand the central ideas and foundations to clarify the relevant aspects in different fields. Curriculum of computer sciences is aligned towards the advancements in information technology. The curriculum taught at secondary level introduce the students to the softwares used in other computer based machines and has the potential to cater the needs of the students who want to join computer as a field in future.

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