

# Reflections on the use of computer in education - the case of developing country

## Reflexiones sobre el uso de la computación en la educación - el caso de un país en desarrollo

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### Abstract

*As computer education gains a lot of importance in all over the world in general and in the developing world in particular, the authors' wishes to bring to the attention of the concerned many points that might help in keeping the computer education within its desired limits.*

*We should not bring up a generation of computer buffs and hackers to whom •friendly• computer has become more important than human friends. The problem is to help young people benefit intellectually and improve their physical co-ordination.*

*The introduction of systematic, well planned, and rigorously implemented programs of vocational education is crucial in the proposed educational reorganization. These elements are meant to develop a healthy attitude among students towards work and life, to enhance individual employability, to reduce the mis-match between the demand and supply of skilled manpower, and to provide an alternative for those intending to pursue higher education without particular interest or purpose.*

**Keywords:** computer education, status of computer in India, caution of using computer.

### Resumen

*La educación en computadores gana mucha importancia en general, en todo el mundo. Los autores desean llamar la atención en este aspecto lo que podría ayudar a mantener la educación en computación dentro de los límites deseados. No se debe crear una generación de jóvenes que consideren las computadoras más •amistosas• que los amigos humanos. El propósito es ayudar a las personas jóvenes a beneficiarse intelectualmente.*

*La introducción sistemática, bien planificada y rigurosa de los programas de educación profesional es crucial en la reorganización de la propuesta educativa. Estos elementos significan desarrollar una actitud saludable entre los estudiantes hacia el trabajo y la vida, reforzar el empleo individual, reducir el desbalance entre la demanda y suministro de mano de obra experimentada, y mantener una alternativa para aquéllos que piensan seguir la educación superior con un propósito particular.*

**Palabras clave:** computación en educación, situación de la computación en la India, precauciones en el uso de las computadoras.

### INTRODUCTION

As computer education gains a lot of importance in all over the world in general and in the developing world in particular, the author wishes to bring to the attention of the concerned many points that might help in keeping the computer education within its desired limits.

### Cautions pertaining to social and intellectual development

We should not bring up a generation of computer buffs and hackers to whom •friendly• computer has become more important than human friends. Social group situations must not be replaced by electronic cocoons, places in which to retreat from reality. It should also be noted that computers can be •fun chums• because of the interesting electronic games that are available. The problem is to help young people benefit intellectually and improve their physical co-ordination without becoming •video junkies• frequenting cafes/parlors spending money.

Prof. WEIZENBAUM of Massachusetts Institute of Technology who invented the Eliza computer program says the temptation to send in computer whenever there is a problem, be it medicine, education or whatever, usually creates the impression that grievous deficiencies are being corrected, but, often its principle effect is to push problems even further into obscurity to avoid confrontation with the need for fundamentally critical thinking.

All the computers in the world won't help if your unexamined and unconscious assumptions on the nature of reality are simply wrong in their basic conception.

### Changing workplace

Lacking a clear vision of the workplace of tomorrow, educators and their students could well waste both money and person years in counter productive efforts to acquire irrelevant or low priority skills and knowledge. It is impossible to predict with certainty the occupational structure that will be in 20 or 30 years to come. Even difficult is to predict the specific skills and knowledge requirements of those jobs.

The purpose of computer literacy especially in vocational education is to prepare young people for work in the information rich, highly computerized offices, farms, factories, banks of the future. This is a high risk educational venture both in terms of uncertain payoff in terms of relevance to tomorrow's jobs and because of the high costs associated with acquisition of computing equipment and provision of teacher training programs needed for adequate computer literacy curriculum.

According to World Bank, a dollar invested in early childhood education yields a higher rate of return than a dollar invested in secondary or higher education. Despite of this, most of the governments are neglecting primary, secondary or higher education and investing heavily in computer education, at their cost. Most of the developing countries, are far behind achieving the target of 100% literacy, hence, basic stress should be given on educating primary school children. Instead, the governments are planning to invest substantially in a subject, which requires frequent up-gradation/replacement of its lab equipment.

### Status of Computer as Vocational subject at school level in India

Major thrust of activities in the area of vocational education remained on training of personnel and development of materials. Working group meetings are being organized to review existing curricula and for development of instructional material in vocational education. Lot of seminars, working group meetings, evaluation studies etc. have been taken up by National Council for Educational Research and Training (NCERT), organs of NCERT, state Government etc. Even after many years in operation, a student with computer applications at Higher Secondary School (+2 level) is denied admission in Bachelor of Computer Science by many universities on the grounds that he/she has not studied Mathematics at +2 level and is admitted only in B. Com. This must be looked at seriously. Moreover, after +2 no jobs are on offer for computer applications students. Hence, they are forced to study on and on, till they get a job. Hence, courses to improve logical thinking/ rationale should be included. Instead of teaching package operations, courses on Algorithms, Flowcharts, Decision making etc. must be made an integral part of the curriculum.

### At college level in India

The University Grants Commission (UGC) launched the scheme of career orientation of education at the first-degree level in the universities and colleges in 1994-95, in conformity with the national policy on education. Under the scheme, university/college would introduce one to three vocational courses in 35 subjects identified by the core committee. Computer Applications was one of the most sought after course. After almost a decade in operation, it is still difficult to find either a professional or an entrepreneur produced by it. Moreover, when many trained Engineering graduates are available no one is willing to employ B.Sc./B.Com. Graduate. Hence, the very basic idea of providing vocational training at undergraduate level has not yielded anything but waste of time, money and efforts and dilution of efforts of teachers who are looking after this subject.

The technology itself is not complementary and is replacing manpower, increasing the pressure of unemployment. It is useful only with nations having less population. A judicious mix is the need of the hour. We must learn from Japan, where they have successfully explored the potentials of the computer without adversely affecting the employment opportunities.

## Vocationalization in the proposed subject

The introduction of systematic, well planned, and rigorously implemented programs of vocational education is crucial in the proposed educational reorganization. These elements are meant to develop a healthy attitude among students towards work and life, to enhance individual employability, to reduce the mis-match between the demand and supply of skilled manpower, and to provide an alternative for those intending to pursue higher education without particular interest or purpose.

It is envisaged that the educational institutions of the century is being visualized as a place where knowledge will be generated, where knowledge will also be refined and reinvented, where knowledge will be examined, explored and restated, where knowledge will be acquired by both teachers and students, where knowledge will be shared by community, and where knowledge will be transformed into experience, into action, into wisdom, into vision and in one form or another. (DUBEY, 2001).

The century needs generators of knowledge, creators of knowledge, adventures of knowledge and self-learners with skills to operate in a competitive world.

## Computer as learning media

There are no learning benefits to be gained from employing different media in instruction, regardless of their obviously attractive features or advertised superiority. The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our grocery causes change in our nutrition.

Despite the enthusiasm, some words of caution are warranted. Firstly, there is a world of difference between knowledge and information. More and more information may even make us less knowledgeable if we become overloaded by information and instant communication. Paradoxical as it may seem, some of the most important issues that the burgeoning technological world creates for education are those of values and the ability to make choices, not technical matters at all.

Secondly, there are profound concerns about the gaps opening up between the have and have-nots, between those who reinforce their access to, and use of, computer in education by what they have and do at home, and those who enjoy little of either. This digital divide may become every bit as profound as earlier forms of rigid social and education selection. Again, enthusiasm for computer's potential should not make us blind to very real accompanying risks.

In the US, the listing of elementary and early childhood educational resources on the internet <http://ericecece.org/ed2link.html> begins with two important questions to be considered when introducing young children to anything new, including technology:

- Is it developmentally appropriate-is it consistent with how a child develops and learns, and with the child's current developmental stage?
- Will the activity benefit the child, or will it replace some other, more meaningful learning activities?

This introduction of computer in curriculum will divide the society into three segments namely, Illiterates, Computer illiterate & Computer literate.

The rate of obsolescence is now so fast that acquisition of computer system is better booked under revenue account than capital account. It may not pinch when an institution pays for it but just imagine the condition of poor parents who get into the trap unknowingly. The obsolete systems only occupy space either on the desk or in the stores.

We hear everyday of technological progress and software skills, can't we use a part of the work force and the corporate infrastructure to serve the interests of general public and develop efficient software to run on low-end machines? Why do we always have to do what the western market wants, completely ignoring the domestic imperatives? The huge skilled workforce in organization like the National Informatics Centre (NIC) and the institutions under Department of Electronics/Ministry of Information Technology could be mobilized for the purpose.

In network environment several alternatives are available however, in standalone mode the market should be able to offer a wide range of choices starting from say Rs.10,000/-. The task boils down to the creation and sustenance of a regular market with old machines like 80286/386/486 based Central Processing Unit (CPU), in parallel with the state of the art market.

This could be one way to increase the Personal Computer (PC) penetration, enhance computer literacy and thereby facilitate the common men/women taste the fruits of Information Technology (IT) revolution.

What are the implications of the practices we follow today? The under-utilization of capacities is national waste indeed. The implication of such

decisions is enormous at the institutional and corporate levels or on the family budget.

## In the west

SEYMOUR PAPERT (PAPERT, 1993) one of the most ardent proponents of use of computers with young learners, says that as long as schools confine the technology to simply improving what they are doing rather than really changing the system, nothing very significant will happen. He suggests that grafting computers to the existing schools is like adding a jet engine to a stagecoach-it can't be used properly without shaking the vehicle apart. PAPERT stresses that computers have an impact on children when the computer provides concrete experiences, children have free access and control the learning experience, children and teachers learn together, teachers encourage peer tutoring and teachers use computers to teach powerful ideas. He calls the computer the •children's machine• because students in public schools, colleges and universities in developed countries do not know a world without the computer they relate to the computer in ways that baffle adults. It is an integral part of their world. They play, are entertained by, and learn with the computer. They tend to be more visual learners than previous generations because their world is rich in visual stimuli. They also thrive on interacting with the device.

## The case of India

In India, there are numerous inhibiting factors, which need to be addressed for successful implementation of computers in schools. Major inhibiting factors are:

1. High procurement time. In government purchase, a lot of formalities are to be completed before the actual order for supply can be placed. This takes a lot of time and energy, which acts as a de-motivator as by the time the computers are supplied their prices in the market falls down and allegations are raised about under the table dealing.
2. High procurement costs. The cost of computer is very high which make purchasing a sufficient number of computers to satisfy the ever increasing student population extremely costly.
3. Non-availability of trained teachers. To get trained teachers to teach computer at village level is very difficult.
4. Language barriers. As reported by ALEXANDER (1999) much of the material available on the Internet, or major software publishers comes from North America, raising for many countries issues about the place for the other languages, cultures, and identities. (Recent Oxford University Press figures suggest that the US commands nearly 70% of the educational CD-ROM market worldwide.) This is true for India as well.
5. Irregular or no electricity supply. In almost all developing countries regular power, supply to operate computer is not available. Hence, there is a need to explore alternate sources such as solar energy, which is available in abundance in India.
6. Fear of pressing a wrong key/accidental deletion of program. It has been observed that if existing teachers are trained to teach computer they have a fear that if due to pressing a wrong key something goes wrong they will be held responsible for the malfunctioning of computer and fixing the problems take a long time as the after sales services in developing countries are not up to the mark.
7. High replacement costs. Normally, every third year due to change in technology, one is forced to buy a new computer. For this, the buy back prices quoted for the old machine are very less hence; again almost the same amount is needed to purchase a new computer.
8. Replacement time is more. As lots of bureaucratic procedures are involved in finalizing a buy back offer the replacement time is more.

Harnessing the potential of information technologies entails more than simply proliferating their use. It means encouraging people to be innovative in applying and tailoring IT to their needs. According to BRESLAR (2000), measuring potential of IT on country level include:

- The level of awareness among leaders and advocates of the potential of IT and what is needed to harness it,
- The state of education and telecommunications,
- The nature of the education and telecommunications systems and their current policies, and
- The ability of those systems to allow people to adapt models to their needs.

New kinds of plans, policies, progressive discourse and pilot studies are needed to reflect the groundwork for the much needed changes, but the

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combination of the right context, resources and support are integral to the success of system-wide innovation. Because implementing systemic change is a difficult process, it is important to know what constitutes an ideal environment. Walker (as cited in BYRON & GAGLIARDI, 1998) lists the preconditions for a successful introduction of IT into an education system:

An appreciation by the government of the financial, resource and operational requirements and the resulting consequences,

A commitment by the government to give time and take responsibility for decision-making and implementation strategies,

A commitment to a policy of an integrated support service encompassing teacher and technician training, curriculum and assessment-together with software and hardware provision.

These preconditions encompass the resource requirements. There is a consensus among practitioners and researchers about what these requirements are, but they have been categorized in many ways: organizational, financial, human, institutional, and/or technical (MEANS, *et al.*, 1993; JAMES, *et al.*, 1999).

### CONCLUSION

The best practices in the use of learning technologies in schools almost requires that the curriculum and learning environment be transformed to constructive, active, learner-centered pedagogies. Where such learning environments are not present, especially where there is a rigid curriculum with high-stakes examinations and teachers accustomed to a high degree

of authority and deference, it is unlikely that even well equipped classrooms will achieve a substantially different outcome.

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