

# Computer Literacy for Academic and National Development: Role of Universities in Pakistan

by

Dr. Muhammad Daud Awan

## Abstract

Literacy in its broader perspective is the ability to read and write in one's own native language and to use that ability. Computer literacy, however, is understanding the role and power of the computer and knowledge to use it by learning basic terminology and primary skills of computers. To make teachers computer-literate the knowledge of hard and software is an essential requirement. Its values and cultural implications have to be imparted to them as a growing knowledge. The present condition of computer literacy in the developing nations, like Pakistan, is in a state of unfancy and immaturity, which is causing great hinderance in the transformation of knowledge into new technologies. The National Education Policy of Pakistan 1992, envisaged that illiteracy from the country should be wiped out, and at the same time computer literacy should be imparted making it a part of educational curricula for teachers and administrators, within a stipulated period of ten years. How this target could be achieved? This paper discusses various aspects for computer literacy with reference to university level computer education and computer literacy for university teachers, leading to national development in Pakistan.

## Introduction

Like industrial revolution the invention of computer has freed the developed world from heavy manual, and arduous mental work. Computer has revolutionised information storing and retrieving processes. Computer provides personalised education service to learners. It reacts with learner's responses and analyses the problems. It offers instruction to learners independently. Computer is best for reinforcement or revision of any

work which has been studied in other ways. It is a storehouse of information and knowledge for students/researchers; a highly advanced communication technology and media for Tele conferencing, Videodisc and Videotex. This multi-media has removed the distance between the teacher and the taught. In the developed world conventional universities have started using distance education systems by the use of this media.

In the twenty first century, the use of computer will enable the people to learn in accordance with the demands of time and place that would satisfy their needs and requirements. We, as a nation, are not living with the fast developing world. Information explosion through dish antennas and other channels of communication has increased the many challenges for us. We have to cope with the modern demands of technology. It is this fast developing media that is making our children more clever and knowledgeable than what we are today. There is not only a generation gap but that there is an information gap too. Our academicians are a product of medieval technology like chalk board and chalk while the dish antenna children are living in the world of information technology<sup>1</sup>, straight away.

The new information technology/computer is intrinsic to national development and has an unavoidable influence on national culture. It is regarded as a powerful set of new media of potential benefit to teaching and to learning. Both of these aspects constitute challenges which have to be met by a prepared plan/policy for education and for university education in particular. It is only then that computer technology can find its easy

---

<sup>1</sup>There is a large overlap between computing studies and the study of Information Technology, but there are two significant differences: computing studies include the study of how the hardware and software work as well as how they are applied; and the study of Information Technology covers technologies such as fax or telephone which are not normally considered in any depth in computing studies courses.

way into higher streams of learning. How is that process to be organized? This educational development will take the rest of the nineteen or twentieth century before computers can be expected to be widely used in our classrooms. Here two particular issues stand out as relevant. These are the status of present university education in the field and the opportunities available for the academics in this area as users of this technology.

#### **Current State of Higher Education In Computer Science:**

The first computers in Pakistan were introduced by PIA for passenger flight reservations in 1960. This was IBM mainframe Computer. Computer education, however, could not be started earlier than 1967-69 when a Fortran Programme course was started by the University of Engineering & Technology, Lahore. There were 17 mainframes through out Pakistan at that time. In the eighties the computer spread like an epidemic, when it became a private business and computer training centres in the private sector came up like mushrooms. Now-a-days all the major cities have one or the other facility of computer education for the intending students.

Still the use of computers and the degree of computerisation in Pakistan is at the basic level. This could be attributed to the lack of qualified and skilled computer personnel. Education is an investment to reap its benefits always in future and our planners of the sixties and seventies seem to have not foreseen the real importance of computer technology and its usage. As a result most of our academicians in the universities are not able to utilize the technology, even if it is available, what to talk of educators at other levels. There are very few accredited institutes which impart training in computer technology. Standard software development is somewhat out of the reach of many computer professionals in the country. Computer education or education in informatics is yet not well organized in Pakistan. People want to know about computers as the technology has been introduced without making its educat-

ion accessible to common learner.

At present out of 22 public universities about twelve<sup>2</sup> are offering Post Graduate Diploma (PGD) courses BSc, BE and MSc courses in computer science through their own departments or through affiliated institutions. Every one has its own syllabus, and there seems to be coordination and cooperation amongst them. None of them have computer literacy programmes for their academic staff, except short term training provided by various agencies in the country.

Being an open distance education institution, Allama Iqbal Open University is offering some specific computer programmes and courses, which are mentioned here. The paras below provide a brief information of computer education given in the University.

#### **Computer Education at Allama Iqbal Open University**

The Department of Mathematics, Statistics and Computer Sciences, of the University, was established in 1988, in the Faculty of Basic and Applied Sciences, to develop distance education materials for courses in areas of Mathematics, Statistics and Computer Sciences and to launch these courses at Intermediate, degree and Post Graduate levels in order to enhance the knowledge of students before they go for higher studies in computer science. The department has 28 courses in offering. Twenty of these are computer science courses. The department in 1991/92 introduced two diploma (post intermediate) programmes namely: "(a) One year Diploma in Computer Applications (DCA) and (b) One year Diploma in Computer Maintenance (DCM) as independent programmes. Allama Iqbal Open University has not established its

---

<sup>2</sup>Allama Iqbal Open University, Quaid-e-Azam University, Islamabad, Karachi University, NED Engg. University, BCCI Fast affiliated with Karachi University, University of Peshawar, University of Engg. and Tech Lahore, Mehran Univ. of Engg. Tech, Jamshore, Bahauddin Zakaria University, Multan, and Gomal University Dera Ismail Khan.

laboratories for science and is using the laboratories of other institutions. Likewise it was not possible for the University to establish Computer Laboratories on its own. Therefore a collaboration to use their computer laboratories was sought with the Petroman which is an industrial training institution of the National Petro Chemical Industry PERAC, which functions under the Ministry of Production, Government of Pakistan and has Computer Science Laboratories almost in all the big cities of the country.

Diploma Programmes are primarily designed for persons presently employed and those who seek employment and/or higher degree, in the field of computer science. Since the start, around seven hundred people have graduated themselves for these diplomas. A degree level independent programme first of its nature in the country "**BA Computer Applications**" has been launched in 1994.

*BSc In Computer Science* has got approval of the Statutory Bodies of the University and will be offered in 1995. B.Sc Computer Science will be followed by M.Sc in Computer Science.

The department/university arbitrarily arranged one or two days course for its officials but has no permanent plan to make all academicians computer literate. The university has basically provided computer facilities to the servicing departments. It was the first university in the country to computerize its students records.

### **Computer Literacy for University Teachers**

The quality of academic staff determines the quality of university education. The product of university teachers of calibre, in our environment, has at least three facets: mastery of one's subject, adequate knowledge of its allied disciplines and of appropriate research techniques; awareness and conformity to, the requirements of the academic career; knowledge, skill, and motivation to administer various components of the university system effectively and efficiently. The greatest shortcoming in our system of university education is recruitment of



university teachers. Most of them are recruited immediately after securing their Masters degrees<sup>3</sup>. "Like the traditional religious institutions of learning, modern universities in Pakistan have primarily performed a conservative role of transmitting the existing stock of knowledge through rote. Few universities can claim to have produced new technologies useful to the society. The output of university scholars in terms of standard scholarly works remains low. Pakistani universities have also not provided a stimulating environment for intellectual fermentation and debate<sup>4</sup>.

The university academicians learn with and about computers for four broad reasons:

- (1) as part of their general education;
- (2) to acquire vocationally relevant skills,
- (3) to assist the learning of other subjects; and
- (4) to assist in the development of general learning skills.

However, computing skills and knowledge could best be acquired by specialist courses for the academicians encompassing software applications.

A Scottish report of 1993 could be generalized to our setting, stating "Computing studies has developed from being a subject restricted to a very few pupils in some schools to the state where most secondary schools offer courses to pupils of all abilities at all stages. This change has occurred since 1982, in parallel with the growth of computing and information technology throughout society. It has involved the training of large number of teachers, the introduction of new courses, the development and acquisition of hardware and software, and the production of entire sets of teaching materials. At the same time, teachers have gained experience of teaching

---

<sup>3</sup>G.M. Khattak, Former Chairman UGC in UGC Report, 1990, p.v.

<sup>4</sup>Dr. Inayatullah The state vs universities in Pakistan, 1992.

with and about computers, and have developed views about the content and delivery of courses"<sup>5</sup>.

This is actually what is going to happen in our schools. Several boards of Secondary and Higher Secondary education have started computer course as an elective subject and pupils are taking these courses. The pass outs are making their way to the universities. Will our university academicians be well acquainted with further knowledge of course delivery to the needs of these students, or will they be apologizing for their incompetence?

Our universities are so called semi-autonomous, being part of the state structure and receiving state funds for their survival, and are somehow directly controlled by the state. The state so far seem to have not realized that the academic staff of the universities must be equipped with the knowledge of Information technology at the earliest.

The only group that could have brought pressure on the universities to evolve a well prepared plan/policy for computer literacy for the university academician was the academic community itself, such as Academic Staff Associations (ASAs), Federation of All Pakistan Universities Academic Staff Associations (FAPUASA) etc. But they seem to have not taken this issue seriously as well and kept themselves away from upgrading and updating their knowledge to cope the demand they may face. Therefore, the academician did not effectively exert themselves to transform universities into a force serving as a guide and critic of the society and have not shifted education from supply to demand oriented. They seem astonished when they hear about the opportunities and usage, computer offers to academicians, in the universities of the developed world.

If the academician don't react even now to update their knowledge, the demanding students and the funding

---

<sup>5</sup>Computing studies, The Scottish Office Education Department, 1993, p.1.

state will react, may be in the way the Bologna masters were dealt with. In Bologna university in Italy (before the establishment of universities in the west), masters were hired and paid by student, they were not allowed to repeat the contents of a previously delivered lecture, or else, they were fined a few Ducats. So was the case if they absented from the class or finished their lecture before period was over. One should not pause to state that if the academician will not come to the standard they will be replaced by information technology. There are clear evidences that "during the 70's, when inconvenient electronic data processing began to become the convenient computing of the 80's the attempts to replace the teacher were again in full flight"<sup>6</sup>. CBT (Computer Based Training and CBE (Computer Based Education) still hold promise for future. These could be the benchmarks of an evolution. A process which did not pull out the beards and strip the tweed of higher education in a dramatic form but is the most important change for academics since the tenure wars for academic freedom. These evolutionary transformations are being cited to underscore that the academic development of the masters has been the basis for the progress of knowledge and national development.

In the workshop, an attempt was made to define and conceptualize several disciplines and their current state of higher education with particular relevance to national development. We have followed the growth of computer science in the developed world. In the beginning, academician/researchers and administrators used the electronic data processing to ease their burdens. Soon the universities began studying about electronic data processing making it a legitimate area of intellectual inquiry. When the science of data processing discovered that information was a single component of what is now known as computing, the use and study of computers led to new ways of working with computers and soon, like the proverbial camel, the computer had taken charge of the educational tent. Today the computer has become the most common research tool across disciplines. The physicist

---

<sup>6</sup>NEVER TOO FAR, Vol.12, 1989, p.9.



plots the structure of elements while the humanist attempts to structure the elements of plots. Commonly faculty crunch their numbers, may store their references, most word process rather than write, and a few communicate almost totally via the computer: As a community worker it is used in traffic control and police investigation, in space journey, in record maintenance, in sports and games and almost in all aspects of a society. Surprising is the fact that most of those using the computer are non-technical in their relationship to it.

The skill needs of the computing industry are in a state of flux too. As a result, the appropriateness of existing graduate qualifications in computing is being seriously questioned. At international level our MSc in computer science is least accepted as equivalent.

Besides providing mainframe computers to 14 universities, the University Grants Commission had been providing admissions to some academician for nine months diploma course run by PAEC's Computer Training Centre, Islamabad. It has also been granting on request some money to the stretched hands for a few days workshops. In all and on its own "the UGC had organised about half a dozen courses on computers to each the use of computers to administrative officers"<sup>7</sup>. It seems the UGC has not taken the issue seriously in a planned manner, which could benefit all academicians. The universities have themselves given a deaf ear to the spreading knowledge availability for their academics. Academy of Educational Planning and Management and Pakistan Computer Bureau,<sup>8</sup> have also been concerned with the training of education planners and administrators in computer use in the country. But computer awareness to university academician

---

<sup>7</sup>UGC Chief, in Datalog, 1992, p.11

<sup>8</sup>National Institute of Public Administration, Petroman Karachi, and some institutions through Pakistan are offering vocational training or continuing computer education for professionals. Individuals also go abroad for computer related education or those who go for PhDs do get a chance to use computers.

has not received due attention from the government or from other authorized bodies.

#### 5. Recommendations for Computer Education For National Development

To enable the universities contribute towards initiating/furthering relevant development through education and research in computer science and to help the nation enter the 21st century with genuine preparedness, the following recommendations for general computer science education and for computer literacy for university academicians are made:

1. Some of issues which really need attention for general computer education in the universities are:
  - a) lack of teachers training for computer at all levels,
  - b) shortage of qualified personnel,
  - c) outdated second generation discarded hardware,
  - d) non-coordinated or standardized syllabus<sup>9</sup>.

The universities have to target a particular section of the population: for example a heavily research oriented university may decide that its intake of students should be drawn from the top 15% of the population. Higher education will in the future attract a great many more mature students. The requirements of the student population will change, in terms of the academic support required for the students. Students and employers would need to be impressed by the offering from a

---

<sup>9</sup>Even though a standard school-level curriculum for computer education at the level of secondary and higher secondary level has been adopted by the boards. The Peshawar Board was pioneer in this area.

university. There is the continuing challenge for the computer faculty to evaluate new methodologies, new languages, new packages, new hardware and new systems. New topic areas continue to appear, like human computer interaction, multimedia developments, formal methods, computer architecture, computer communications, real-time systems, software quality assurance, object-oriented design, system project management, high integrity and safety critical systems and business computing etc. Therefore Out Dated Computer Education should be replaced by updated, easily available and demand oreinted one, so that it could be more attractive and beneficial. And our academicians have to attain appropriate competencies to get ready for this challenge, so that the computer education and the skills acquired by students who successfully complete the courses must be seen as being of benefit to students and the society, which will surely lead to national development.

2. A Joint effort is needed by the government, universities, professional bodies, and associations to improve the quality of education in general and quality of informatics education in specific. Academics need better terms and conditions as computer faculty. Computer science is facing dramatic uplifts and the faculty need updating of knowledge; to make the courses self sufficient; coor-

dination between the graduate absorbing market/industry (the industrialization required a highly sophisticated manpower) could be a well receiving effort; periodical conferences; workshop and seminars on computer education; will be an investment in the academics for better returns for the national development.

3. Government may stretch its helping hand by providing funds to introduce computers in the universities (as it has started Prime Minister's Programme for Promotion of Computer Literacy" at the national level); by constructing libraries containing latest information on the discipline; by

computerization of the different departments; by replacing of manual typewriters and easing the regulations for import of the hard and software and by subsidizing the prices for the academic use of computers. It is worth mentioning that the micro technology has reduced the price of computers as well as its size, mini and main frames are being replaced by PCs and Pcs by LAPTOP, Notebook and Palmtop computers which even can be used on board and with dry cells instead of electric power.

#### 4. Academic Staff Development, UGC

National Academy of Higher Education (NAHE), UGC, Islamabad and Staff Development Programme of Allama Iqbal Open University have been providing opportunities of training and further education to university teachers but almost nothing in computer literacy for university teachers stand on the syllabus of these programmes.

In 1990, AIOU, and the UGC, with the collaboration of Unesco office, organized a national conference on organization and management of academic staff development units in the universities (ASDUs). A Central Academic Staff Development Unit (CASDU) at the NAHE was established and the author of this paper who worked as secretary to the conference was given assignment as "Director CASDU". A comprehensive plan and syllabus for nine month diploma (to replace NAHE course of 3-months duration for new university teachers) for university education was prepared and ASDUs of the universities were actively coming ahead to work for their staff development. In the syllabus for the diploma computer education has been placed very high, believing that teaching and research competencies are sharpened by the use of computer, pre-service or in-service. Moreover courses for senior academicians were also planned to be started. But unfortunately funds were not made available and the work is still pending. A post of Director Educational Development and Research was also advertised but then the Chairman, did

not process the applications for appointment. No tangible activity either by ASDUs or CASDU could have been initiated without funds. This work needs to be revitalized and ASDUs and CASDU should take it as a mission to properly train the university academicians for the challenges of the time to come. So that they can play due part in the national development.

5. The University Grants Commission in Pakistan has direct access to an international on-line data base system in USA through the Scientific Information Retrieval Network and a established computer network between five universities of the country.

It has now made international E-Mail facility available for universities as well. Now it is up to the individual academician and the universities to use this facility for their knowledge updating and for national development. Both of these facilities require computer literacy to benefit from them.

6. The FASPUSA should struggle for a crash programme by the UGC to make university academicians computer literate. It is sad to say that FAPUSA has not placed their updating of knowledge on their demand agenda even in 1994. Through the lines of their resolution there comes no demand to the authorities to eradicate computer illiteracy from amongst the university academics. This trend needs serious thoughts. If the academics themselves will not motivate themselves to be computer literacy who else will come forwards to asisst them.

Finally, it is to be made clear that the academics have to catch up and acquire the update knowledge of their disciplines and use of computers to enter consciously and safely in the next century, otherwise or else they will lag much behind.



## References

- Jagannath Mohanty, Educational Technology, Dep & Deep Publications, New Delhi, 1992.
- National Education Policy, 1992, Ministry of Ed., 1992.
- OECD Informatics Studies, Conference on computer/telecommunications policy OECD, Paris, 1975.
- The Open University, Computing Curriculum for the 90s, Milton Keynes, 1992.
- The Scottish Office Education Department, Computing Studies, Scottish Office Education deptt., St Andrew, 1993 (Book Syllabus).
- Datalog, Vol.4.No.6 June 1991, 1/10 Commercial Area, MA H Society, Karachi, 1991. (Quarterly Magazine).
- Datalog, Vol.5, No.5, Feb.1992, 1/10, Commercial Area, MA H Society, Karachi, 1992.
- Infromage, For the Latest Information Technology. Vol.1, No.8 & 9 Shahdab Printers, Chundrigar Road, Karachi, 1992.
- Never too far, Vol.12, April 1989. UNESCO, 1989.
- PUTA News Bulletin, Vol.1, January/March, 93-94. University of Peshawar, 1994. (Newsletter)
- National Conference on Organization and Management of Academic Staff Development Units in the Universities (OMASDU), 17-22 March, 1990, AIOU/UGC, 1990 (Report).
- Inayatullah DR, The State of Universities in Pakistan. Unpublished paper, 1992.
- Qazi, H. Dr. Problems of Academic Staff Development in Pakistan. Paper presented at OMASDU conference, AIOU, 1990 (Unpublished paper).