PROBLEMS AND ISSUES CENTRAL TO THE USE OF MICROCOMPUTERS IN SCHOOLS

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The study and use of computers in Turkish educational system were confined-until 1980 s mainly to the universities and a few technical schools which offered computer science programs computer programming courses for management and research purposes. With the advent of microcomputers that lowered the cost barriers, a considerable number of computer hardware has started appearing in public and private schools in Turkey at a rapid rate.

As stated in the most of the related articles and research papers in the literature, the technical developments of the past decade which resulted in increasing memory capacitiy and decreasing cost of micro-computer chips had opened a new era in education. The micro-computer has revolutionized the computer industry. It might well do the same for computer based instruction (Walberg 1987). Because the cost, the portability and the ease of maintanence of microcomputers make them much more available to schools than perivous maxi and mini systems.

Recently a special emphasis has been placed on the utilization of computers in schools and on computer assisted instruction by the Turkish government and by the Ministry of Education. As the Prime Minister stated "Turkey is going to accomadate the schools of the nation with one million microcomputers the next decade." It is the most expensive and the largest project in the history of Turkish Republic's Education. This means approximately 600 million US dollars of additional investment for education. In order to initiate the computer assisted instruction with this target in view, under the cooperative responsibility of Ministry of State for scientific and technological affairs and the Ministry of Education "The Project of Computer Assisted Instrution" was prepared and an administrative unit was established recently.

Through the realization of the project, Turkish goverment aims to prepare the children and the youth of the nation for a world of computers

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and of new information systems and technologies. It is also expected that computer assisted instruction will increase the schooling ratios at the elementary and secondary levels and improve the quality of education and level off regional differences apparent in schooling. Thus, the project is concieved as one of the strategic investments of scientific and technological advancement of the Nation.

In the second week of October 1987, in co-operation with the two responsible Ministries mentioned above an International Conference was held in İstanbul and the main features of the Turkish CAI project was introduced to the representatives of the universities, computer industry, institutions which have vested interest in the project, and to the experts in computer science and computer based instruction. During the conference the project was discussed, comments on the feasability, implementation and dissemination were gathered.

Turkish government intends to realize the project by contracting the task to the international consortiums which will include Turkish partners such as universities, companies or institutions in electronic industry.

Before negotiating for the contracts of the project necessitates each consortium to establish a research center for CAI which will carry out proposed pilot studies in schools and prove its capability in terms of know-how, provisions of personnel and hardware and preparation of software-courseware. Meanwhile it is expected that the interested consortiums will conduct researches on the following issues:

- Survey of the conditions of Turkish educational system for the adaption of CAI to Turkish schools.

- Translation and adaption of courseware prepared in other countries.

- Research on the study habits and learning styles of Turkish students.

- Comperative research work between consortium countries and Turkey.

Computer assisted instruction will be implemented at the elementary and secondary schools initially. A gradual dissemination program will be planned and realized. In the project special reservations are made for training of the teachers and the school principals. As could be foreseen from the brief description above a tremendous work needs to be achieved in the years to come. It is expected that the Turkish üniversities with know-how, accumulated skills and research centers in computer sciences and computer based education will play an important role in the realization of the project.

Due to the implementation of a nationwide computer assisted Instruction program, there will be more demand for the courses related to the use of computers in instruction, and the preparation of courseware that is to be offered by the universities. It seems possible that in the future some portions of preservice teacher training of curricula will be delivered via computers. In this context a close cooperation among departments of computer sciences and of education as well as teachers and curriculum specialits needs to be established. The universities will have new resposibilities for preparing the teaching staff, courseware and conducting research at he various phases of computer assisted instruction project.

The Issues and Problems Related to Computer Assisted Instruction

Introduction and dissemination of computers for instruction is an innovative action in the Turkish case. The steps for implementation and social, economic and political conditions of the country and the cultural characteristics of the schools should be taken into consideration.

Some of the studies dealing with introducing microcomputers to the schools in other countries revealed that there are certain issues and problems pertinent to the use of computers for instruction. These included 1. the new roles are necessary in response to microcomputers, 2. the teachers generally felt inadequately prepared despite in service training courses conducted by qualitified teachers and computer resource personnel 3. A general desire was expressed by teachers for better quality of software 4. There was a concern on the part of the principals and the majority of teachers for the basic security and maintanence of hardware. 5. A worry was expressed regarding the different access to microcomputers for example between less able and able students (Sheingold and others 1983).

In another study in England it was reported that teachers had a great many reservations beside the advantages of computers. These reservations were about the quality and availability of educational software, the danger of computers encouraging solely games and playing, problem of infrequency use and the problem of only brighter pupils using computers and the less able ones losing out (Blis, Changra and Cox, 1986). In a recent project, computer based instruction increased students motivation and concentration in general. The students have responded positively to the privacy and immediate feedback offered by this medium. However it is learned from the exprience that the key to everything was well designed and relevant software and integration of computer based insruction into existing courses and curriculum (Bell, 1986).

In the evaluation of the Scotish Microelectronic Development Programme, it was found that there were a number of factors inhibiting the use of computers. The main ones were the lack of teacher training programs, widespread sense of isolation and poor communication between the programming unit and the schools. The evaluators of the program felt that the Scottish Microelectronic Development Programme had built up the impression that "success laid in the number of machines it could distribute, but not in the use of computer." They point out the need to incorparate microcomputers properly into the curricula (Bliss, Chandra and Cox, 1986).

There is data available about how computers are effectively used in schools. Becker (1986) has published an enormous amount of detailed information about the situation in the US. Becker reported that a typical high school had more than 20 computers, a typical elementary school had 6 in 1985. The way computers are used by students is quite different for each school level. In the elemantary schools computers are used for drilling, practice and tutorial purposes whereas in high schools almost half of the computer time is on computer programming. It was observed that the amount of time a pupil can use a computer in relation to the total school time available is marginal in the US and some of the European countries (Moonen, 1987). In their article Niemiec and Walberg (1987) studied the comparative effects of computer assisted instruction and produced synthesis of all the reviews done in the USA. They report that the average effect for microcomputer based studies at college level is .43 sigma. At the elementary school level the effets are much more higher. The effects of CAI on learning seemed to vary with student level and instructional mode. According to the findings it is fairly well established that computer assisted instruction raises achievement at a moderate rate. As also demonstrated by Kulik and his colleagues (1983) CAI is particularly successful for the younger students However Niemiec and Walberg point out the necessity of the research on the following questions:

- How effective is CAI in terms of other instructional interventions?

- What are the possible Hawthorne or novelty effects which may create extra student motivation?

- Do the CAI effects stem from rote procedures yielding superficial and easily forgetten material?

- May the average superoity of CAI over conventional instruction accounted for by simply a greater overlap of lessons and formative and summative tests?

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They also add that much more work is needed in the area of cost-benefit analysis in order to find out "whether is CAI worthwile or not?"

In summary, introduction of computer into a school system is not an easy task. With the rapid development of new technology, teachers, administrators and especially politicians are inclined to use new devices before they fully undestand their appropriateness to the instructional purposes. For that reason the new technology is sometimes abused and learners are obstructed (Herd, 1984). In many research reports it is suggested that in the early stages of implementing computer for instruction the priority should be given to staff development and to the selection of carefully appropriate courseware to be used. Secondly the integration of computer based instruction into existing courses and curricula seems to be the most pressing issue in this area. The major obstacle for the integration of computers into curriculum is the rigidity of existing organizational and class structure, involvement of large numbers of teachers and their needs for in service training. A successful introduction of computer assisted instruction is based upon for interrelated condictions:

1. Availability of sufficient amounts of standardised hardware in schools.
2. Availability of a large program of pre-service training for teachers.
3. Availability of sufficient amount of good quality of educational software-courseware.
4. Integration of CAI into the organization and the curriculum of the schools.

As described in the previous pages, Turkey is about to introduce "computer assisted instruction" to the elementary and secondary schools through the implementation of a nationwide project. It is a large scale innovative attempt. Computer assisted instruction is a new area for to study and practice in Turkey. Most of the educators School principals and teachers are not familiar with computer technology. However, at some of the universities where departments of computer sciences and of engineering in electronics well established are functioning effectively with a good reputation. In these institutions skills in computer programming and know how are very well developed and research activities are increasing. On the other side, departments of educational technology are few in numbers and have recently established. Research studies are very limited and qualified personnel are scarce.

In some countries of the world utilization of computers has a relatively long history. In these countries such as the USA, England, Japan and Holland there is a considerable amount of experience and accumu-

lated knowledge in the use of computers for education. Turkish computer assisted project will be realized to a great extend with the imported technology-hardware and courseware. The adaption of technology to the educational system is a challenging work. For that reason, reviewing and investigation of the practices and research findings in computer assisted instruction in different countries would make possible to illustrate common trends which lighlight the issues of critical importance. Morever, to identify when, how and why computer assisted instruction has been successful or unsuccessful and to diagnose the reasons will help to create situations under which computer scientists, educators, school principals and teachers can work effectively.

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