COMPUTER INNOVATION IN EDUCATION: INITIATION IN TURKEY

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INTRODUCTION

This paper describes a study of the initiation phase of computer innovation in education in Turkey. The first Computer-Aided Education (CAE) project was introduced in 1984 by the Ministry of National Education and focussed on hardware and training teachers in Basic programming. The pilot project of 1988-89 commissioned the development of courseware for 37 subjects as well as providing further training and additional hardware. The main CAE project was initiated in 1990-91 as part of the World Bank National Education Development Project, which included a program for introducing computer literacy and computer aided instruction in grade 10 of selected secondary schools. The Ministry placed approximately 6,500 computers in 396 secondary schools and trained 250 teacher trainers and 5,000 teachers. The schools were provided with courseware for 141 subjects. As part of a project funded by the European Commission, the author has conducted a study to gain an understanding of how secondary school teachers perceived computer innovation in their schools. This paper summarizes the results of the study pertaining to the initiation phase of the innovation.

THE RESEARCH

Drawing upon the work of Fullan (1991), a conceptual framework was prepared for assessing the presence of supporting conditions for successful initiation. The framework was organized around *relevance* (need for innovation, clarity, practicality, congruence, instrumentality, cost/benefit ratio), *readiness* (commitment, compatibility with culture, front-end training, materials, other change efforts, planning, coordination time, prior relevant experience, provision for debugging, skills, understanding), and *resources* (central administration support, in-service support, school administration support). The study sought to determine whether; the innovation was *relevant*, the teachers were *ready* for the innovation, and the *resources* were provided. The research methodology can be characterised as multiple case studies with school as the unit of analysis. Formal pre-structured interviews for use with teachers, coordinators and principals were designed to include the list of successful initiation features defined in the conceptual framework. The case studies were of three schools: two state schools which participated in the CAE project (Schools A, B) and one private school which had been involved in its own programmes of IT innovation (School C). School A is a selective state school while School B is a vocational school. All three schools offer instruction partly in English.

FINDINGS

Was the innovation relevant?

Need. Teachers considered computer education necessary for national progress in science and technology and for preparing children for future work. There was no need to use computers in teaching other subjects; computers were needed for "teaching about computers."

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Clarity. The aims of the innovation were not clear for the two schools involved in the CAE project. In School C, where the innovation was internally developed, the aim was to integrate computers in all subject areas.

Congruence. The innovation was generally congruent with teachers' practices and views of teaching. Teachers hoped to use computers in their teaching and expected benefits to students. It was not congruent with students' lack of time due to the requirements of the university entrance examination.

Instrumentality. The instrumentality of the externally introduced innovation was low in the schools involved in the CAE project. The ministry did not send any implementation guidelines and left the *hows* of the innovation to the schools.

Costs/Benefits. Costs included effort, time, personal resources, threat to sense of adequacy and negative effects on teaching. The benefits of using computers did not include any significant rewards. The expected benefits of computers included teaching more effectively and enhancing students' problem solving abilities. The possibility of adverse effects on students' socialisation was a concern.

Were the schools ready for the innovation?

Commitment. The teachers showed strong personal commitment towards learning about computers. All but one had participated in various training programmes during out of school hours. Some personally paid the fees for training. School administrations' commitment appeared to vary.

Compatibility with culture. Schools A and C are driven by university entrance examination while School B prepares the students for employment. Hence, the innovation was highly compatible with the culture of School B and not so with School A. School C is a private school and hence expected to provide computer literacy to its students. Many teachers in School A give private tutorials to prepare children for the university examination, and getting involved in the innovation may mean a financial loss. Teachers in School B do not face such a demand. School C's culture was conducive to the adoption of the innovation due the presence of several foreigner teachers who had brought with them various software. The school also featured an atmosphere of "cooperative interaction".

Front-end Training. In School A the coordinator and the principal had attended short courses, but "Nothing was beneficial." The coordinator of School B had attended a 1-month course and a 4-month teacher trainer course. The courses emphasized programming and did not answer the teacher's need. Some teachers participated in a nine-month training, which focussed on programming and did not "correspond to the curriculum." School C' coordinator had a degree in programming and two computer teachers had received training in programming.

Materials. The schools involved in the CAE project had a laboratory of 20 networked computers and 141 packages of courseware. School C had established two computer laboratories, but software was limited mainly to office applications.

Planning, Coordination Time. With typical course loads of 24-30 hours, lack of time was a problem in all three schools.

Prior Relevant Experience. The coordinator in School A had experience with technical equipment as a science teacher. He owned a computer and was preparing the school timetable on the computer. The coordinator of School C had strong relevant experience. The principal had been involved in computer

innovation in the USA since late 1970s as a headmaster.

Provision for Debugging. There were no planned provisions for debugging in Schools A and B. There were no imperatives to use the innovation. The provincial IT coordinator was a channel for conveying feedback to the Ministry.

Skills. In school A, the coordinator used a school management package. He considered the skills of other teachers inadequate. In School B, the coordinator had some knowledge of spreadsheets and programming. Other teachers lacked skills to use computers with students alone. In School C, the coordinator is a programmer. Many teachers in the school could use the school computers.

Understanding. In Schools A and B, the teachers had developed limited understanding and awareness of the scope of the educational possibilities of the innovation and interaction with the Ministry needed for developing meaning for the innovation was limited. Teachers in School C gave an impression of having sufficient understanding of the innovation.

Were the resources provided?

Central Administration Support. In Schools A and B, support of the central administration was considered inadequate. In School C, strong financial support was received from Agency International Development.

In-service. School A had no teacher trainer; 8-10 teachers had attended a 2-week course for *implementor* teachers. The coordinator of School B attended an 8-month computer course during the weekends. He organised courses in his school for other teachers. The coordinator of School C attended a 2-week course for *implementor* teachers. That course was not satisfactory. The school ran a one-week course on word processing.

School Administration Support. In School A, the coordinator was satisfied with the support of the principal. The principal stated that they were not encouraging the teachers. In School B, the teachers felt the lack of support. School administration was helpful to the coordinator. In School C, the coordinator acknowledged the support given by the principal and the administration.

CONCLUSIONS

In spite of the front-end training, and provision of hardware and software as well as on-going in-service training support, the conditions associated with successful initiations were not fully satisfied at the schools involved in the CAE project. The externally mandated innovation with "no aims" was introduced into schools where neither the teachers nor the students had time for an extra activity and the teachers' knowledge, skills and self-confidence were not adequate. The need for using computers as teaching aids did not exit although computer education was considered necessary. The situation in the private school was congruent with the aim of expanding computer education. Various costs and returns were considered by the teachers concerning their involvement in the innovation and the cost/benefit ratio was not favourable. The outcomes of the initiation process can be characterised with "interest and happiness" toward a tool necessary for scientific and technological progress and hopes for using it in teaching as well.

REFERENCES

Fullan M.G. (1991). *The New Meaning of Educational Change*, 2nd ed. London: Cassel Educational Limited.