# 14

# Implementation of computers in Malaysian schools: problems and successes

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ABSTRACT

In this paper, problems and successes that have emerged during an experimental Computer-in-Education (CIE) project in Malaysia are highlighted. The experimental CIE project is taking place in 60 rural secondary schools. The main thrust is computer literacy. The paper discusses problems associated with in-service training, movement of teachers, scarcity of resources and hardware and successes achieved so far.

*Keywords:* developing countries, government, information technology, literacy

## INTRODUCTION

Malaysia's vision is to become a fully industrialized country by 2020. To achieve this vision (Vision 2020), the country needs to turn the present school generation into the leaders of tomorrow. It is essential that people must have information technology skills - defined as familiarity with the use of computers, knowing how to use the computer and knowing how to take full advantage of the computer in various situations.

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The Prime Minister stated in 1991 that, in the information age, Malaysian society must be information rich and computer literate if it wants to progress and develop [1]. One of the immediate tasks of the ministry of education is thus to ensure that its students are computer literate by the time they leave school. Since a seven year-old and thirteen-year-old today will be respectively 33 and 39 years old in 2020, they will be then among the main contributing members of the society.

## COMPUTER-IN-EDUCATION PROJECT

The Computer-in-education (CIE) project is Malaysia's second attempt to introduce information technology into schools on a national scale. The CIE project is expected to be implemented in stages; it is now in its experimental phase. It was launched in July 1992 by the Minister of Education in 60 rural secondary schools chosen among over 1,400 schools.

Malaysia's CIE project is probably unique because of its implementation in schools in remote areas of the country. The schools are far from the nearest small town, usually surrounded by rubber estates, oil palm estates, paddy fields or rain forests. They are often "in the middle of nowhere". The students come from poor families whose fathers are farmers, rubber tappers or work on the estates. Their mothers are usually housewifes and both parents are poorly educated.

To illustrate how remote these schools are, four of the schools do not have telephones, one is only accessible by boat, about eight schools are served by dirt roads and are at least two to four hours bumpy drive away from the nearest small town. To get to some of the schools from the city, one would have to take a small plane, usually a twin engined Otter, to a small clearing in the jungle and get a taxi. The taxi ride is usually another two to four hours.

Rural schools were chosen over urban schools to correct the existing imbalance between the schools that already have and schools that do not have computers. More than 800 other schools have computer clubs. The challenge to introduce computers into these schools is thus very great.

The ministry formulated the topics for a computer literacy syllabus, trained teachers and supplied hardware and software to schools. The total cost to implement the CIE project in the 60 schools was RM 4.8 million (US 1.8 million). Computer Literacy is taught to 13 and 14-year olds, that is, those in Form One and Form Two for two years. Each school received 20 made-in-Malaysia PCs that are networked to a 386-SX server (16 MHz,

4MB RAM and 120MB hard disk, trackball), an Electronic Imaging System (EIS) and a printer. Each computer is shared between two students and sometimes three depending on the total class enrollment. The software purchased for the schools included WordPerfect 5.1, DrawPerfect 1.1, dBaseIV, Lotus 1-2-3 ver. 2.3, Power BASIC, EJA-BMTeks (a local spell checker), DR-DOS 6.0 and D-Link's LANsmart.

According to a survey among all computer teachers focussing on the early stage of implementation, initial teething problems made teaching difficult [2]. Only about 40 percent of the computer lessons were successfully carried out.

Topics in the Computer Literacy Syllabus for the CIE Project are:

| | |
|---|---|
| Introduction to the computer | Graphics |
| Types of computer systems | Spreadsheet |
| Computer system and operating system | Database management system |
| | Introduction to programming |
| How computer processes data | Effects of computer use |
| Computer ability | Effects on lifestyle |
| Microprocessor | Computer misuse and abuse |
| Application packages | Computers in the future |
| Word-processing | Computer careers |

The other 60 percent were not carried out mainly due to lack of teacher confidence as well as hardware and software problems. However, after one and a half years of implementation many computer classes are now running well. Nevertheless, problems such as computers breaking down or the EIS not working are still common.

**Problems**

Implementation of a large project is never easy. In the CIE project, most of the problems are associated with ineffective in-service courses, movement of teachers, scarcity of resources and hardware.

**Teacher selection and training**

Two teachers from each school were identified to become computer teachers. They were chosen from among those most likely to stay in the same school over the next few years to ensure the CIE project is successfully implemented. In addition, each of the thirteen State Education Departments sent an officer to act as a resource person and to help the CIE Unit co-ordinate the project at state level. They then

attended in-service courses organized by the CIE Unit of the ministry that is in charge of implementing the project.

Male teachers formed the majority and about half of the teachers were either science or mathematics teachers. Most (58.1 percent) had more than four years of teaching experience and 94.3 percent of the selected teachers had attended at least one in-service course [2]. The first in-service computer course was held in December 1990 and the fourth and last was in July and August 1992. The courses covered an introduction to computer hardware and how to use the respective application package including how to program in BASIC.

The courses were conducted mostly in English by personnel from the software distributor companies. English is the main language used within the private sector but the medium of instruction in schools, institutions of higher learning and the official language of the government is Malay. The teachers in the group are more well-versed in the Malay language. According to several teachers, not only was there a language problem, but the pace was too fast and the approach used was ineffective. Two or more teachers were sharing a computer and this was unsuitable because of their computer inexperience. Furthermore, there were no assessments or evaluations to see how effective the in-service courses were.

Participants felt that the courses were inadequate, particularly for those handling computers for the first time. The problem was augmented when they were unable to continue their practice of the software due to the absence of computers in schools. The computers for the project were not delivered to schools until mid-1992. Thus teachers had very little time to learn on their own. Many teachers felt that it was not easy to teach the computer literacy subject, especially when they themselves were still learning. The most difficult was BASIC programming. Several teachers mentioned they had to leave out this topic.

Perhaps, Malaysia should consider giving PCs to the teachers to bring home after the course. Some of the more successful teacher training programmes in the US have found this to be effective because teachers can use the computer whenever they wish, have more time to explore, take risks and become proficient in the use of the software [3].

**Command of the computer syllabus**

When teachers were asked how they rated themselves in their knowledge of the more theoretical topics in the computer course, it was found that their understanding was also below the minimum level required.

Among all the software, WordPerfect was the easiest to learn. It was mastered by 56.2 percent of the teachers. Next was DrawPerfect (48.6

percent), Lotus 1-2-3 (42.8 percent), DR-DOS (24.2 percent), dBaseIV (21.4 percent) and EJA-BM Teks (19.6 percent). Lowest on the list was BASIC Programming with only 13.6 percent of the teachers reporting mastery. These statistics were a result of a survey conducted among the teachers in March 1993, eight months after the launch of the CIE project [4]. These figures are not encouraging. It goes against the recommendation by Flake, McClintock & Turner [5] that the teacher should at least know what the student should know. The teachers should be 100 percent proficient before being able to teach.

The percentage of teachers with good or very good understanding of the theoretical topics in the Computer Literacy syllabus is shown below:

| | |
|---|---|
| Introduction to the computer | 53.4% |
| Types of computer systems | 43.8% |
| Computer and operating system | 40.0% |
| How computer processes data | 35.3% |
| Computer ability | 36 |

**Teacher movement**

The identified project teachers should have been among those most likely to stay on in the same school. However, as many as one-third of the original group were transferred to other schools. New teachers were appointed to replace them but this posed a dilemma. These new teachers needed time to become involved with the computer classes due to their low level of computer literacy. Basic skills such as copying files from one disk to another and managing the hard disk was a major problem for such teachers. Computer viruses posed an even greater difficulty. Most of the time, teaching was limited to what the teacher knew, thus covering only part of the syllabus.

**Hardware**

In addition, hardware sometimes caused problems. Electrical surges frequently damaged the computers in some schools prone to attacks of lightning. The server was rather slow and downloading of software took too much time and precious minutes were lost before a teacher could begin teaching. Other problems included hard disk management. Often, in schools with inexperienced teachers, hard disks were corrupted or some essential files lost. In such instances, the teacher resorted to using the

computers as stand-alone machines. About 20 schools frequently experienced computer break downs because of serious electrical fluctuations and needed auto-voltage regulators.

**Resources**

Even more difficult was the scarcity of resources. Only about 20 of the schools had books, reference materials and teaching aids for students in the first year of implementation. The ministry only supplied software packages. Schools did not receive a budget to purchase other resource materials. Teachers found it difficult to prepare lessons and acquire reference materials. Although there were a good number of local reference materials, most of these were either unknown to the teachers or not easily available in the rural areas. Many imported reference materials were available, but were only found in city bookshops. Even if they were easily accessible, the prices would have been prohibitive.

**Successes**

Overall, students were enthusiastic, looked forward to computer classes and were disappointed when classes are cancelled. This in itself has been a major accomplishment of the project. Without the project, these students would have never experienced computers first hand in the school. An interview with a few Form Two students revealed that they and all of their classmates enjoyed the computer classes (70 minutes per week) and that it was their best-liked subject in school. They felt extremely fortunate to be among the few in the country to be taught computers as a subject. This was further supported by their teacher who stated that when computer classes were held outside normal school hours, the students had no complaints even though it meant coming to school four hours earlier in order to catch the only bus. This was due to time-tabling problems; not all computer classes could be scheduled in the afternoon along with the other subjects. Thus, half of the computer classes were in the morning, outside their normal school timetable.

One particular school located amidst rubber plantations, two hours away from Kuala Lumpur, was particularly successful; here the computer teachers were very motivated about the project. In this school there are 23 Form One and Form Two classes and each class was taught 70 minutes of computers each week. Two computer teachers would normally be able to handle these two classes between them. However, these two computer teachers, like all the other computer teachers in all the other schools, had two other subjects to teach. The other two subjects were considered more important because of examinations held at the national level. The teachers

were overloaded in trying to teach all three subjects. To overcome this problem, they trained 17 of their colleagues and today, this school has 19 teachers who are able to teach the computer course. This has been a major accomplishment.

Headmasters have had a significant role in ensuring the success of the CIE project. It was found that schools with headmasters who frequently discussed problems with the computer teachers had more success in implementing the project. The principal of the school referred to above has been very supportive, in spite of not being a computer user himself. He has even managed to get air-conditioners for the computer room, a luxury that one rarely finds in any Malaysian school.

## CONCLUSION

Successful implementation of any project, particularly one that is this large, with schools scattered throughout the country and in remote areas, is extremely difficult. Some of the project schools do not have telephones or are only accessible by boat or dirt roads. In a developing country such as Malaysia, most facilities and resources are concentrated in cities and large towns. The administrative centre is in Kuala Lumpur, which is the capital city and the hub of the nation. Both the CIE Unit and the hardware supplier are located in Kuala Lumpur. However, it is strongly believed that if teachers were well-trained, many of the problems described above would not have occurred. At present, the CIE project lacks effectively-trained teachers both in quality and quantity. To succeed, it has to ensure that its in-service training is effective. The teacher is a key to technological integration, and in addition, this teacher needs strong administrative support and adequate resources.

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