優質教育基金 Quality Education Fund

M:FR/E

Final Report of Project	**Project No. : 2004/6089**

Part A

Project Title: **Enhancement of IT Infrastructure**

Name of Organization/School: **Kowloon Technical School**

Project Period: From **06/2005** *(month/year)* to **10/2006** *(month/year)*

Name of Project Leader: Chung Wing Keung
09/2006 – 10/2006

Name of Project Leader: Ip Pak Lun
06/2005 – 08/2006

Part B

1. Attainment of Objectives

Objective statement

- Upgrade of out-dated IT equipment to ensure quality of teaching and learning in IT-related subjects.
- Adoption of e-learning
- Support to school administration and school image promotion
- Study the feasibility and suitability of new IT technology in teaching and learning and recommending them to relevant sections

Activities related to the objective

i. 69 computers in two computer rooms, ITLC, Music Room and the Principal Room were upgraded in June 2005.
ii. 19 wireless access points covering the whole school premise were installed in Oct, 2005.
iii. The installation of e-learning platform was completed in June, 2006.
iv. 5 new computers were installed in Student Affair Office for administration works in Sept, 2006. Therefore all documents stored in school intranet were converted into pdf files in Oct, 2006.
v. Building learning content for e-learning platform starting from Oct, 2006.

Plan / Activities	**Evaluation Method**	**Evidence or indicators of having achieved the objective**	**Extent of attainment of the objective**
Phase I in the procurement and installation of IT equipments – fund from EMB and school vote - Installation of wireless access points - Upgrading 69 students computers in the above mentioned rooms (i)	- Questionnaire to computer teachers	- All computer teachers were satisfied with the newly installed hardware and software	- Target met - Target met
Phase II in the procurement and installation of IT equipments – fund from QEF - Installation of additional wireless access points and outdoor antennas - Procurement of PCMCIA wLAN cards	- Questionnaire to teachers	- All computer teachers were satisfied with the newly installed hardware and software - Not procured, incompatibility issue was noted	- Target met
Phase III in the procurement and installation of Computers for Administration - 5 Computers in the Student Affair Office	N.A.	- The staff were satisfied with the new hardware and software	- Target met - Target met
Phase IV in the procurement and installation of IT equipment – **fund from school vote** - Procurement of software license - Procurement of learning content	- Questionnaire to teachers	- Procurement of software and learning content is still under way.	Target met
Selection and installation of e-learning platform	- Questionnaire to teachers	- 86% of teachers found the platform	- Target met

	- Participation of student in the platform	useful and easy to handle - 70% of students logged on the platform at least once a week	- Target met
Building learning content for e-learning platform	- Amount of learning content built	- A total of 63 interactive exercises were uploaded	Response from certain subjects were not as enthusiastic

2. Project Impact on

(a) Learning Effectiveness

The project's effects on the learning and teaching effectiveness have already been supported by data obtained from opinion surveys mentioned. Impact of the project on other areas of students' learning effective are discussed below:

@ Broadening students' horizons

The upgrade of the computers of the Computer Rooms and ITLC made it possible for some computer and D&T lessons to be conducted more effectively. This gave the students a good environment on learning of Information Technology.

Furthermore the use of wireless LAN opened a free environment in the learning and teaching. Students and Teachers can access the Internet anywhere inside the school campus.

@ Increasing students' sense of achievement

With the use of more powerful computers, students can do all tedious works with them in doing projects/experiments and write up reports easier and more effectively so that they can spend more time to analyze their projects/experiments. This also gave the students extra sense of achievement.

@ Fostering students' development in their potential and specific abilities

Some students are particularly good at Information Technology and computer. Students were encouraged to fully utilize the availability of more powerful computers and access to the Internet for learning. Some students were trained and equipped with other non-curriculum Information Technology knowledge. (e.g. Photoshop, Premier, Supercomputer etc) Many students won many prizes in different areas of Information Technology. Apart from these, other possible channels for students to develop their potential and specific abilities using the Information Technology are still to be explored.

@ Equipping students with a variety of learning approaches

Students learn in ways very differently from what they do in conventional classrooms. Students learn, in the Interactive classrooms, interactively by getting the information that they need from the internet.

Teachers can also serve out questions or worksheets to the students via the LAN system and the e-learning platform in the classrooms. The response of each student to the questions being served out can be immediately pooled back by the teacher, and the pooled data can be shared among the class. This interactive learning process promotes active participation of students, and the immediate feedback makes it possible for the individual to interact with others in lessons. This brings a totally different perspective to the learning and teaching in the classrooms.

@ Training students to better meet social demands

In this computer and IT era, the students using the Interactive classrooms have the competitive edge over their counterparts in Hong Kong, and in other parts of the world, in the use of IT and computers to aid their learning. Whether the students will become teachers, science researchers, IT experts, the early exposure to the great capabilities of computers and IT equipments to aid learning will bring them to the frontiers of IT and computer technology when they grow up to serve the society.

@ Cultivating students' team spirit

As several students were grouped to do projects/experiments by using upgraded IT equipments and the e-learning platform, the group members must work closely as teammates. It was noticed that students often had a desire to show the teacher and the classmates that they are doing a good job, so that the teacher may show their work to the rest of the class (by computer screen capturing of their work with the computer, or by video capturing with their manipulative project work). This brought about a stronger team spirit within the group, and the students clearly improved in their collaborative skills.

(b) Professional Development

The project had an impact on the professional development of teachers. Some of these are discussed below:

@ Increasing teachers' sense of achievement

The teachers' sense of achievement is increased in two different areas. First, teachers of the IT team had a sense of achievement for being able of converting their vision into reality. Secondly, teachers using the upgraded computers, wireless LAN and e-learning platform all find their teaching more interactive, effective, efficient and innovative. They also find that students are keener to learn, responding more promptly and spontaneously, and classroom management becomes easy. Teachers feel a strong sense of being 'professional' when teaching in the Interactive classroom.

@ Increasing training opportunities for teachers and enhancing their professional development

A number of training sessions were arranged for the non-project IT team teachers on how to use the e-learning platform, wireless LAN and upgraded computers. In doing so, teachers had the opportunity to learn to use the high technology, interactive and IT setting. After the training sessions, manuals prepared by the IT team members were given to the non-IT team teachers to try out teaching in the interactive IT facilities and platform hands-on. Teachers, after gaining this new teaching experience, had to re-think and to adjust their routine modes of teaching. All these lead to enhancement of professional development of teachers.

@ Improving teachers' professionalism and self-improvement in the process of implementation

During the implementation of the project, the IT team members had the opportunity to improve their professionalism in a number of ways. First, teachers had to put heads together to make full use of their professional knowledge as teachers to give ideas as on how the e-learning platform and the wireless LAN should be constructed and what improvements to teaching and learning could be achieved when the facilities in the e-leaning platform and the wireless LAN were available. This gave a chance for the IT team members to brainstorm based on their professional knowledge, and to learn from other team members in the process, and to improve each individual member's professionalism as a teacher.

Secondly teachers had to interview a lot of contractors and suppliers in the preparation phase. During this period of time, teachers of the project team knew a lot more about the building and fire ordinances, learned a lot about the newest advancements in LAN and computer technology that can be applied to education, and knew exactly what IT in education products are available on the market and what each product can or cannot do. All these gave the project team members a deeper insight into what the new trends of development in IT in education would be like.

Thirdly, the project team members had to manage the money granted by the QE Fund, and to use the money wisely so as to maximize the benefit to the school and the students (like negotiating with the contractors the maintenance scheme that would be provided after the project had been complete). This also gave the team members a most valuable experience in educational management which could not have been so well learnt even if they attended a management course in education.

@ Broadening teachers' scope of vision

Being able to meet so many businessmen, salesmen, technical men of computers and video-recording systems, and eventually educators from other schools and institutes who gave valuable opinions, the teachers of the project team really went through an eye-opening experience which widened their scopes of vision in many areas. Furthermore, with the construction and utilization of the Computer room and wire LAN, which we believe to be first in the world, actually provided a chance for the non-project team members to widen their scope of vision on teaching and learning.

@ Inducing cooperation with professional organizations which equips teachers with enhanced professional knowledge

With the upgraded computers and the help from the Hong Kong Education City in the process of organizing IT events, workshops, training courses, seminars and other activities had been successful. Furthermore, up till the present, educators from other schools and institutes have joined our workshops on “Supercomputer”. As experts from the public highly esteemed the innovative ideas of the “Supercomputer”, another sharing session has already been arranged for in mid-December, and we expect more of these would be arranged for sharing and exchanging of ideas and knowledge among educators from different institutes. All these are expected to enhance professional knowledge of teachers and induce cooperation between professional organizations.

(c) School Development

The project has also had a number of effects on development of the school, and some are discussed below:

@ Shift of paradigm in the science education of the school

As the wireless LAN and e-learning platform setting was well received by students, teachers, and the Principal, the school decided to upgrade the MMLC into a more Interactive Multimedia Language Centre which will has all functions of the Interactive equipments. With this news, more language teachers began to switch to the more interactive, computer aided teaching styles.

@ Enhancing the overall image of the school

In Shamshuipo district, many parents and primary students have the impression that Kowloon Technical School is just a vocational school. In order to change their misimpression, courses, seminars, workshops and competition related to IT have been held for parents and primary students. Students of primary schools in Shamshuipo district were invited to visit our school. It helped to tell the public that IT and high technology were our school strengths. Examples of this were the workshop on "Using Photoimpact in Image Processing" held for parents and volunteers in Ka Ling Primary School and the "Opening Ceremony of the Classroom TV Network of PLK Chee Jing Yin Primary School".

In addition, the "Supercomputer Project" was promoted among schools in Hong Kong. For this project, many local reporters interviewed our principal, our "Supercomputer Project" team members. At last, the project was reported in various IT magazines.

@ Improving learning atmosphere

The project team was delighted to see that the reality matched their expectation, that there had been a general improvement in learning atmosphere when students had their lessons in the Interactive and Open environment. There are two main causes for the change:

i. The students find learning smoother and more productive in the Interactive and Open environment with the wireless LAN and e-learning platform. We have the view that youngsters have a natural curiosity and desire for knowledge. However knowledge is now freely available elsewhere, as from TV or home educational VCDs, that if education in the school is outclassed in quantity and quality, the youngsters would loose interest in learning in schools. The Interactive and Open learning environment provided a means for totally new way of learning, where teachers can easily present large volumes of knowledge by pre-prepared software, show live demonstrations using the visualizer, get information from the vast ocean of knowledge by browsing the Internet with the students during lessons, and get and give immediate feedback via the e-learning platform between teacher and students. This great improvement in quantity and quality in education greatly aroused the interest of students in their lessons, and in informal conversations most students thought that their learning had been more pleasurable and effective in an interactive open learning environment.

ii.. The physical characteristics of the Wireless LAN enabled the teacher to conduct lessons everywhere inside the school campus. This made teaching and learning activities in school more interactive and

open, as reflected by data from the questionnaire survey. As students found their needs more quickly addressed to by the teacher, they were less restless, and were able to concentrate better on the learning activities. This also had the side effect of making class management easier for the teachers.

Whatever the reasons, what is most important is that, students can learn in a better learning atmosphere in school.

@ Increasing inter-school collaboration and interflow

As mentioned earlier, many workshops, visits, seminars and talks had been organized, and more are being arranged. During the sessions already operated, guests expressed their views that our vision on using IT facilities had been inspiring and stimulating to them, and they also gave us invaluable opinions that we can incorporate into the teaching practice that we do in the Interactive and Open learning environment. The construction of the wireless LAN, the Supercomputer and the upgraded computers had not only brought about occasions of interflow and collaboration among schools, but is expected to foster more future interflow and collaboration among schools.

@ Stimulating the motivation for collaborative learning in school

As explained earlier, the need to share a computer for doing projects/experiments and communicating with the teacher made it necessary for students to learn to collaborate in their learning in the school. This is also needed when groups do a part of a tedious work and then share their results via the wireless LAN system or the e-learning platform with other groups, to complete a complicated project.

Furthermore, teachers had also to collaborate in learning how to make the best use of the new information technology, and to write up and share educational software like presentations, interactive worksheets (to be used on the LAN system) and other worksheets especially designed for use in the Interactive and Open learning environment. The collaborative learning is not motivated at the students' level, but also at the teacher's level. There is research evidence overseas that what teachers themselves do would have a substantial influence on their students, so we strongly believe that the Interactive Laboratory had a very positive effect in this respect.

@ Promoting a culture of action research in school

As part of the project, the project team (IT team) had to carry out questionnaire surveys on teachers and students, so as to evaluate the effectiveness of the IT infrastructure enhancement. The project team held meeting to design the questionnaires so as to try their best to ensure validity and reliability of the surveys, and also when the survey data were out, meetings were held again to interpret the data. This started the culture of action research in the school. Since then, a number of similar action researches were carried out by various departments of the school, and the project team was often consulted when other departments were to prepare for their researches.

@ Fostering team spirit in school

As mentioned earlier in this paper, the Interactive and Open learning environment has fostered team spirit both among teachers and students using the IT facilities. When teachers had to collaborate and

work as a team in completion of the project and to prepare materials for use in the Interactive lessons, and when students had to collaborate with their group members when learning or doing projects/experiments, and to share data among groups, team spirit is built in the process.

3. Cost-effectiveness

To quote some of the guests who have visited the school campus and watched our demonstrations on the capabilities of the wireless LAN, the e-learning platform and the new computers, the project was "extremely cost-effective" and the facilities were "very reasonably priced" To further elaborate on the cost-effectiveness of the project, the issue will be inspected from a number of angles:

@ Utilization of available resources

The two computer rooms, the ITLC, the wireless LAN and the e-learning platform, since they were complete, had been quite fully utilized by teachers and students for teaching and learning activities, and for teacher assessment.

@ Unit cost for the direct beneficiaries

As stated the QEF application, the direct beneficiaries were all teachers and students in Kowloon Technical School (around 1100 persons). The sum granted by the QEF to sponsor the project was $300,000. The unit cost for each direct beneficiary can be calculated as $273. However, since once the IT infrastructure has been enhanced, it will continue to serve the school and the students before it is out-dated. From our experience we believe that the life expectancy of the hardware and software should be about 10 years before they need to be upgraded again.

4. No deliverables and modes of dissemination

5. No difficulties encountered