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**Digital Opportunities Pilot Project (2001-2003)  
Evaluation of Generation XP**

**Report to the Ministry of Education**

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**RESEARCH DIVISION**



**Wāhanga Mahi Rangahau**

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**Digital Opportunities Pilot Project 2001-2003**

# **Generation XP**

## **Final Evaluation Report 2005**

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This work was carried out whilst the author was employed by Christchurch College of Education.

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## **Abstract**

The progress of the Generation XP Digital Opportunities Pilot Project is reported for the period January 2002 to December 2003. During this time, eight low decile secondary schools in Auckland and Gisborne piloted running Microsoft Office Specialist and other industry level IT courses with their senior students. The pilot proved to be a successful '*proof of concept*' with nearly 1000 students studying the MOS courses during the two years. By the end of 2003, the evaluator had been notified of a total of 107 students passing one or more component units. Between them they gained over 200 passes. All students gained valuable IT skills during the project. Pakeha and Asian students with good academic ability proved most successful in gaining the qualifications. Schools' success with MOS courses led to training for other qualifications such as IC<sup>3</sup>, MCP and CISCO being initiated (See Glossary of acronyms at the end of this report.).

Schools identified issues relating to the pedagogy of the MOS courses, the nature of course resources and the pre-course teacher training.

The MOS courses were registered on the National Register of Quality Assured Qualifications, and approved for credit inclusion towards the National Certificate of Educational Achievement.

Involvement in MOS courses did not seem to affect students' future career interests, a very high proportion being interested in University study. Several Gisborne students obtained part time work tutoring computer courses.

Infrastructural problems affected the early stages of the project. These were influenced by the diversity of schools' networks, and by schools working to incorporate the Generation XP computers into their networks. Later in the project, technical issues were less of a problem, although there was a need for adequate resources to be allocated for ongoing technical support.

The research clearly demonstrated that the most successful schools were those which had an institutional and teacher commitment to the success of the project. Identification of committed schools, and involving them fully in the government/business partnership, together with a well designed and ongoing programme of professional development of teachers, could have resulted in greater success for the MOS students.



## **Executive Summary**

One of the research questions was to identify ‘lessons which have been learned from the pilot which could usefully inform any roll out of the scheme to other schools and to other school districts’. This summary begins by listing the evaluator’s suggestions regarding these lessons and suggestions. These are followed by a summary of findings and lessons categorised under headings corresponding to the main foci of the research.

### **KEY LESSONS AND SUGGESTIONS**

Most schools did not perceive the project as being a true ongoing partnership between schools, businesses and the Ministry. They felt ‘dumped on’. True partnerships would involve ongoing cooperation and communication between the partners for the duration of the project. Schools and students would benefit from a greater awareness of the business world and its opportunities. Businesses could get greater exposure and recognition of the social good of their involvement.

In future roll outs and similar projects, volunteering by committed schools and their full involvement in the partnership is most likely to guarantee project success. It is also recommended to establish realistic and meaningful performance criteria for schools to work to, and encourage schools to establish effective monitoring and control systems for the project. Such systems could be designed by schools and other stakeholders as part of the establishment of a partnership.

At the end of 2003, the MOS training was being extended to a further 20 non pilot schools.

There were software problems especially in the initial stages of the project. These difficulties were in part caused by schools needing to integrate the machines with school systems rather than running the Generation XP machines as a stand alone facility. Set-up was delayed by the variability of schools’ computer systems. Working towards common school systems, or at least creating inventories of school systems was recommended. There were also problems setting up the testing software, both in the initial stages and periodically as a result of upgrades to the testing software. Future roll outs should consider funding schools for sufficient technical support to ensure that their systems are adapted quickly to cope with upgrades.

Several schools did not find it straightforward to integrate MOS with other courses. MOS was often seen as a useful extension for more able students.

Teachers had mixed feelings about the training offered at the start of the project. Most were not satisfied with the training, regarding it as inappropriate and poorly planned. Teacher selection, initial training and ongoing professional development were seen as crucial to the success of the programme. Professional development was regarded as necessary to cope with staff attrition from the MOS courses, and to help teachers cope with technology, course and assessment upgrades. Staff training and professional development would need to be carefully targeted to the staff who teach MOS courses. Using unqualified teachers in MOS classes has proved unsuccessful and should be discouraged in future. MOS teachers would need encouragement to reflect on their performance.

Most coordinators reported dissatisfaction with the pedagogical approach of the courses and with the course books. Some prepared supplementary resources which they thought more suitable, and others experimented to make the courses more appealing. However, teachers frequently commented about lack of time to prepare for the courses. Creation of teaching resources relevant to New Zealand school students should be encouraged, as should provision of sufficient resources for the numbers of students enrolled.

Teachers in schools that made the courses compulsory were least satisfied with the courses as they taught them. There is evidence of student resistance to the compulsory nature of the courses in these schools. Making the courses compulsory had a negative effect on student candidacy and success in MOS examinations.

In order to increase numbers of Maori and Pacific students taking the courses, it is suggested that target levels are set and that local iwi and Pacific community leaders should be involved in planning roll outs of the project. The project could be located in marae and other community centres as well as schools. In order to improve accessibility of the qualifications for Maori and Pacific students, the learning environment and courses need tailoring to their needs. This could include greater teacher encouragement of students, modified course materials and teaching approaches.

There appeared to be no barrier to out of school access to computers or to MOS programs for the vast majority of the students.

## **COLLECTED FINDINGS AND LESSONS RELATED TO RESEARCH FOCI**

### **Why did students chose to do the Microsoft qualifications courses?**

In 2003, increased overall percentages of students cited qualifications or value of the courses to their future or careers, (39% compared with 25% in 2002) and less mentioned increased skills or knowledge as reasons for studying MOS (9% compared with 15%). Within these findings, there was considerable variation between schools. One of the leading MOS schools had a threefold increase in the percentage of students citing qualifications in 2003, and a 50% increase in those citing career or future reasons.

Two schools made the courses compulsory. This resulted in compulsion being given as the most common reason for taking the courses. In these schools in 2002 there was no mention of qualifications or future benefits as reasons, and only minimal mention in 2003.

There is evidence of student resistance to the compulsory nature of the courses in some schools.

### **How successful were students in obtaining the relevant skills and gaining the qualifications?**

80% of students surveyed claimed competence or expertise with Microsoft *Word* and 65% made the same claim with *Excel* after the MOS courses. Students also gained good skills with *Access*, *Power Point* and *Outlook*.

In 2002, 71 students (10% of enrolments) passed one or more MOS examinations. The figure for 2003, notified to the evaluator late in the year, was 36 (13%).

Making the courses compulsory had a negative effect on student candidacy and success in MOS examinations.

### **Which groups of students tended to enrol in the courses, and gain the qualifications?**

*Gender distribution:* In 2002, 54% of the Generation XP students were female, whilst in 2003, this percentage had increased to 61%. This is largely accounted for by a decrease in the percentage of total responses from one boys' school, and an increase in that from one girls' school.

*Age distribution:* The age distribution of Generation XP students in both years was similar with a mean age of 16.5 years in both years, and a standard deviation of 0.7 years in 2003 and 1.2 years in 2002.

*Ethnicity:* The overall percentage of European students enrolled in both years was less than the national average for 16 year old students, reflecting the diversity within the communities of the

participating schools. However, within the participating schools, it appears that European students were over represented compared with Maori and Pacific students. A higher percentage of European students enrolled overall in 2003 compared with 2002. The increase coincided with a decrease in the percentage of Pacific students. Percentages of Maori and Pacific students passing the examinations were very low. Passes were dominated by European and Asian students, with Asian students performing best in proportion to their numbers within the schools.

*Academic achievements:* The distribution of 2001 school certificate results amongst Generation XP students in most schools was similar to the distribution amongst the school as a whole. However, in all schools, the more academically able students dominated MOS examination passes.

There appeared to be no barrier to home access to computers or to MOS programs for the vast majority of the students.

### **Did participation in the courses influence students' career interests and ambitions?**

There was no difference in students' interest in IT as a career between the entry and exit surveys in 2002.

On entry, a higher percentage of students in 2003 responded that they were '*very interested*' in IT as a career. This percentage increased noticeably in the 2003 exit survey, with a concurrent decrease in the '*interested*' category.

The percentage of students who thought that IT skills were '*very important*' for employment also increased during 2003.

Percentages of respondents who were '*not interested*' in IT careers; or who thought that IT skills were '*not important*' for employment remained substantially constant over the four surveys at between 30 and 40%.

Generation XP students showed a high degree of interest in further and tertiary education after leaving school. In all four surveys 57% or more respondents were '*very interested*' in university education.

### **Did they seek or find employment on leaving school which used the ICT skills gained during the courses?**

It proved difficult to follow up MOS students after they had left school. In the event it proved possible to interview only 17 ex-students.

Only one of the interviewees was in employment in an IT based occupation.

Thirteen were involved in tertiary study leading to computer or business qualifications.

Most interviewees reported using MOS skills for a range of purposes including preparing assignments, and personally.

Some had mentioned the MOS courses in CVs or at interview, or thought that Microsoft skills had helped them to obtain jobs or entry to tertiary study.

Students from Gisborne schools undertook a range of part time work which used their MOS skills.

### **Did students enrolled in the Year 12 ICT courses come back to do ICT qualifications in Year 13?**

Nearly 30% of the students studying MOS courses in 2003 had been taking the courses the previous year.

**Did the existence of the courses influence students' decisions about staying or leaving school?**

Over 60% of students in each year rated Microsoft qualifications as 'very important' or 'important' in their decisions to stay on at school.

**In what ways and how much did students apply learning from the Microsoft qualifications courses to their learning in other subject areas?**

90% of students anticipated that MOS courses would help their learning in other subjects. After the courses, the same percentage of students claimed that MOS courses had been helpful.

Students consistently reported that they used *Word* for assignments, *Excel* for mathematics, accounting and data processing and *Power Point* for presentations.

Students increasingly regarded the MOS applications as useful everyday tools.

**What was done during the pilot project in order to get the Microsoft Qualifications registered on the New Zealand Register of Quality Assured Qualifications and accepted for credit inclusion towards the National Certificate of Educational Achievement?**

**How easy was it to register the Microsoft Qualifications on the New Zealand Register of Quality Assured Qualifications and to have them accepted for credit inclusion towards the National Certificate of Educational Achievement?**

A registered provider was chosen to sponsor the process of registration and credit inclusion of the MOS courses.

The provider compared the MOS qualifications with qualifications which were already on the NZQA Register to establish comparability of levels.

Although the MOS qualifications presented a novel case to NZQA, being foreign owned commercial qualifications, the process of accreditation and approval followed a standard course.

The process was complicated and hence lengthened by involvement of several stakeholders in the process.

Legislation has now been changed to allow non providers to submit courses for registration.

**How was the qualifications course regarded by other students in the schools, by parents and by prospective employers?**

Year 11 students at Gisborne schools were knowledgeable and positive about the courses. Many Year 11 students at Auckland schools had little awareness of the courses.

Student attitudes and knowledge appeared to reflect teacher enthusiasm and publicity about the courses within the schools.

Most parents of MOS students in schools where participation was voluntary were very positive about the courses. Very few parents were very negative about them.

A small number of parents expressed misgivings about the course pedagogy.

A limited amount of data was obtained on employers' attitudes to the MOS courses. The most reliable data, from a tertiary institution which had employed some MOS students part time, was overwhelmingly positive about the students' technical and on-the-job skills. The courses had led to a 'big breadth and depth of knowledge.'

**How technically reliable and robust, over time, were the ICT systems put in place by the business partners?**

All schools experienced difficulties with the IBM computers during the project. These difficulties were caused by a batch of faulty hard drives and by overheating.

There were software problems especially in the initial stages of the project. These difficulties were in part caused by schools needing to integrate the machines with school systems rather than running the Generation XP machines as a stand alone facility.

Set up was delayed by the variability of schools' computer systems. Working towards common school systems, or at least creating inventories of school systems was recommended.

There were also problems setting up the testing software, both in the initial stages and periodically as a result of upgrades to the testing software.

Infrastructural problems were much less of an issue in 2003 than in 2002.

The NZ agent for the MOS qualifications developed a trouble free procedure for getting new centres established quickly to run MOS courses.

**How much, and for what purposes, were the infrastructural technologies provided by the business partners used by the schools for purposes other than the provision of Microsoft qualifications courses?**

Most schools worked to integrate the MOS computers into the wider school network in order to make fullest use of them.

The computers in all schools were in almost constant use throughout the school day. Apart from the MOS courses, they were used for a wide variety of applications including other ICT courses, web based research, art and design, *Power Point* presentations, word processing reports and spread sheeting for mathematics and science. Teachers at one school used them for writing student reports.

Some schools made the computers available outside classroom hours, one running an internet café for students. Other schools made the resources available to the wider community.

**In what ways did any relevant content resources or communications tools provided through TKI contribute to the organisation and the teaching of the Microsoft qualifications courses?**

The Generation XP website was used in the early stages of the project to pass on information from the lead business partner to schools and to post periodic reports from schools.

After the set up, the web site was not used as a communication tool or resource for the project.

**To what extent, and with what effects, were the schools able to integrate or separate their teaching of the Microsoft Qualifications with the teaching of other specialist ICT courses for other qualifications?**

Three of the eight pilot schools, all single sex, taught the MOS material in stand alone courses. Two of these schools made the courses compulsory, and had among the lowest pass rates of the pilot schools.

The remaining schools integrated MOS teaching with that of other ICT based courses.

Most of these schools did not find it straightforward to integrate MOS with other courses. MOS was often seen as a useful extension for more able students.

Teachers commented on the difference in pedagogy and requirements between the MOS qualifications and the common New Zealand qualifications.

**How effective did the qualifications course tutors find the training and professional development offered by the business partners?**

Teachers had mixed feelings about the training offered at the start of the project. Most were not satisfied with the training, regarding it as inappropriate and poorly planned.

Teachers appreciated the opportunity to attend the *Navcon* ICT conference in Melbourne.

Ongoing professional development was considered necessary, especially to cope with staff attrition from the MOS courses.

Professional development provided by Computer Press during visits to schools was seen as very helpful.

**How satisfied were the qualifications course tutors with the courses as they have taught them?**

Teachers in schools that made the courses compulsory were least satisfied.

Most coordinators reported dissatisfaction with the pedagogical approach of the courses and with the course books. Some prepared supplementary resources which they thought more suitable, and others experimented to make the courses more appealing.

Teachers frequently commented about lack of time to prepare for the courses.

**To what extent did the teaching staff in the pilot schools, other than those who taught the qualifications themselves, use the Microsoft Qualifications training as a means of upskilling themselves as users of ICT?**

Schools sent staff, including non-Generation XP staff on the initial training course. This had the effect of raising the ICT profile within schools.

A few teachers gained MOS examination passes, and others studied the courses in 2002. This professional development was constrained by time pressures.

In 2003, little use was made of MOS courses for professional development in the schools.

One school planned to incorporate MOS and IC<sup>3</sup> in staff training in 2004.

**Supplementary Research Question. In view of concerns expressed by MOS teachers concerning readability of the MOS ‘Step by Step’ course books, how does the readability of these resources compare with other MOS texts and with New Zealand produced ICT resources?**

The *Step by Step* resources provided to support the programme were found to have reading ages up to four years higher than those of texts commonly used in New Zealand schools with this age group.

A new resource is being produced locally, by a respected author of computer teaching resources, to support teaching of MOS courses in New Zealand schools.

**To what extent, and under what conditions, did the stakeholders regard the project as sustainable in the pilot schools beyond the pilot phase?**

Schools and businesses regarded the programme as being sustainable in the future.

The fact that the courses had achieved NZQA approval and credit inclusion was regarded as important.



Many of schools' concerns were addressed with the Ministry's Memorandum of Understanding regarding continued support in 2004.

Schools continued to voice concerns regarding ongoing costs for maintenance, upgrading and being an accredited centre.

Examination costs even at subsidized rates may prove to be a barrier for students.

At the end of 2003, the MOS training was being extended to a further 20 schools which were not part of the pilot project.

**What lessons were learned from the pilot which could usefully inform any roll out of the scheme out to other schools and other school districts?**

In future roll outs and similar projects, identification of committed schools and their full involvement in the partnership is more likely to guarantee project success.

It will be helpful to establish realistic and meaningful performance criteria for schools to work to, and encourage schools to establish effective monitoring and control systems.

Teacher selection, initial and ongoing training was seen as crucial to the success of the programme. Teachers need encouragement to reflect on their performance. Using unqualified teachers in MOS classes was not successful and should be discouraged.

If the aim is to be to improve the qualifications of Maori and Pacific students, the environment and courses would need tailoring to their needs. This could include greater teacher encouragement, modified course materials and teaching approaches.

Courses and presentation would need to be adjusted to be attractive to Maori and Pacific students. This could be difficult given the nature of the content and assessment regime.

In order to increase the numbers of Maori and Pacific students taking the courses, it is suggested that target levels be set.

Local iwi and Pacific community leaders should be involved in planning roll outs of the project.

Publicising the courses among the target communities was seen as vital.

The project could be located in marae and other community centres as well as in schools.

The need was highlighted to create teaching resources relevant to New Zealand school students.

Schools were provided with too few course books for the numbers of students taking the courses. In future roll outs, it would be important to provide sufficient teaching resources for numbers of students enrolled.

Students would be helped by sourcing or producing relevant formative assessment materials with the same level and format as the qualifying examinations.

Upgrading the programme to accommodate new versions of the course content and testing software would involve extra costs unique to the programme. Schools would need funding for sufficient technical support to ensure that their computer systems are adapted quickly to cope with these changes.

Staff training and professional development would need to be carefully targeted to the staff who teach MOS courses.

New MOS teachers would need training, and ongoing professional development of MOS teachers would be needed to enable them to cope with upgrades to the curriculum and technology.

Initial training was seen as desirable to help new schools to set up MOS training courses.

Most schools did not perceive the project as being a true ongoing partnership between schools, businesses and the Ministry. They felt 'dumped on'.

True partnerships would involve ongoing cooperation and communication for the duration of the project.

Schools and students would benefit from a greater awareness of the business world and its opportunities. Businesses could get greater exposure and recognition of the social good of their involvement.

Communication could be fostered by periodic newsletters reporting progress with the project, and by business representatives visiting schools once or twice a year.

The Digital Opportunities Manager or the Generation XP Project Coordinator could facilitate communication.

## Introduction

The primary purpose of this evaluation was to work with the project's key stakeholders to provide formative and summative data on the outcomes of the Generation XP project, January 2002 -December 2003.

This final report of the Generation XP evaluation is expected to form part of a summary document incorporating the evaluations of all four Digital Opportunities Projects.

The aims of the evaluation were to:

- identify the extent to which the provision of Microsoft qualifications courses in the pilot schools contributed to raising the achievement levels of participating students in technology and contributed to learning in other learning areas.
- identify the extent to which the provision of Microsoft qualifications courses contributed to students' choices to stay at school and continue study, as well as to their employment aspirations.
- assess the robustness and sustainability of the ICT infrastructural support provided by the business partners in the project.
- assess the impact of the professional development offered to staff in the participating schools on their own ICT skills and their teaching of the Microsoft qualifications courses.
- document the process of placing Microsoft Qualifications on the National Qualifications Framework.

## GENERAL GOALS OF THE DIGITAL OPPORTUNITIES PROJECT: GENERATION XP

Like all the other projects which comprise the Digital Opportunities initiative, the Generation XP Digital Opportunities Project, known in the Digital Opportunities papers as the ICT Technology Training Project, had the general aim of *'bridging the digital divide'*. In other words, it had an *'overarching goal of raising student achievement and improving student participation, particularly in the areas of mathematics, science and technology'*, and especially in school catchments where access to adequate ICT infrastructure had been limited.

The particular focus of the Generation XP project was clearly to *'bridge the gaps'*, of ICT access, ability and attitude between students in higher and lower decile schools, and to lower infrastructural, socio-economic and geographical barriers to student achievement and participation, especially in relation to technology skills and qualifications. West Auckland and Gisborne were selected as two districts in which such barriers were felt to exist. Students in these districts were given the opportunity to study for and gain Microsoft Office qualifications whilst still at school.

Initially, five low decile secondary schools (four in West Auckland and one in Gisborne) were selected for the pilot. During 2001 this number was increased to include all of the urban Gisborne secondary schools, bringing the total number of schools in the pilot to eight.

The eight schools involved in the project were:

<b>Auckland</b>	<b>Decile</b>	<b>Gisborne</b>	<b>Decile</b>
Kelston Girls High School	4	Lytton High School	2
Kelston Boys High School	3	Gisborne Girls High	4
Waitekere College	4	Gisborne Boys High	3
Rutherford College	4	Campion College	5

The business partners in the project were:

- Microsoft (project leader)
- Datacom Ltd
- Computer Press Ltd
- TelstraClear (formerly Clear Communications Ltd)
- BCL Ltd
- IBM Ltd
- Learning Centre Trust (LCT)

These business partners were contracted to provide the pilot schools with:

- good quality bandwidth (a minimum of 128K)
- hardware and software
- staff training and courseware related to MOS and other Microsoft qualifications
- access to the Microsoft examinations through the Qualifications Framework.

For their part, the participating schools were contracted to provide '*credible and transferable*' Microsoft qualifications for students.

The implementation of the project was expected to proceed in two phases. Phase 1 involved the teaching of MOS qualifications within normal classroom courses in the pilot schools. Phase 2, was to involve the teaching of more advanced qualifications (e.g. Microsoft MCP courses) by means of a 'virtual classroom' connecting the schools through audio and videoconferencing links. In the event, this technology proved difficult to implement, and some students received MCP training by face to face instruction. However, in some schools the project has acted as a catalyst for the introduction of a range of other ICT industry courses such as IC<sup>3</sup> and CISCO. The project has also raised the profile and reputation of ICT within the schools.

## **SCOPE OF THE EVALUATION**

Information for the scoping of this evaluation plan was gathered through:

- Three meetings with Ministry of Education staff from the Research Division and the ICT Unit, and scoping researchers for the suite of Digital Opportunities Projects.
- Written material providing background on the Digital Opportunities Projects in general, and specifically related to the Generation XP project.
- Interviews with key stakeholders from two of the schools and the business partners involved. These included interviews with four staff with specific responsibility for the Generation XP

Project from among the business partners, two principals of participating schools, the liaison teacher/coordinator for the Gisborne schools, three teachers of the qualifications courses in Gisborne, and some students undertaking the course at Lytton High School.

- One site visit, to Lytton High School, to observe the programme in action.

The primary research questions agreed at the start of the evaluation between the Ministry of Education and the evaluation provider were:

- What is the impact of the Microsoft qualification for the participating students in terms of who chooses to do it, their success in gaining it, its impact on students' learning both in technology and other subjects, its influence on students' career interests, likelihood of finding employment, and continuation at school?
- What will be done to ensure the Microsoft qualification is placed on the National Qualifications Framework, and how well regarded it is by other students, parents and employers?
- How reliable are the ICT systems put in place by the business partners, how are they used by schools and how are materials available through TKI used to support the course?
- What is the impact of the qualification on teachers and their teaching?
- How sustainable is the project likely to be?

These questions were designed to address the aims of the evaluation.

The evaluation adopted a multi-method approach to data collection within the general methodology of a multiple case study. The focus of the evaluation has been more on the ongoing collection and periodic reporting of outcomes data than on the detailed description of implementation processes. The case studies have covered the two full years of classes in schools – 2002 and 2003.

The evaluation was formative in the sense that the researcher has provided the participants with periodic reports summarising key findings of the analysis of outcomes, in order for the implementation of the pilot to be adapted if necessary. These reports were provided at approximately six monthly intervals

As it was primarily an outcomes-based evaluation, a key feature has been the continuing measurement of outcomes against the most commonly expressed stakeholder goals and objectives. In the scoping interviews and analysis undertaken during the development of this plan, different stakeholders placed an emphasis on different goals. However, with one exception, there was a general consensus among stakeholders as to what the main goals were. In general, there were commonly expressed goals related to students, goals related to the qualifications themselves, goals related to the ICT infrastructure provided by the business partners, and goals related to teachers and the teaching of the qualifications.

The exception to the stakeholder consensus regarding the goals of the project was that the goal of '*placing the qualifications on the National Qualifications Framework*' seemed to feature only in Ministerial documents. It was hardly mentioned in any of the scoping interviews with stakeholders. During the course of the project, however, it became increasingly clear that registration of the qualifications, and inclusion of credit for achieving them into the NCEA framework was indeed important for schools. Hence an enquiry into the progress of the effort to place the qualifications on the Framework was part of the evaluation process.

Although one or two stakeholders made passing reference to a possible role for the project in modelling pedagogical innovation and enhancement in ICT related fields, the nature of the courses was such that opportunities for significant pedagogical experimentation in terms of delivery were limited. Accordingly, this was not seen as a major priority for the evaluation. Notwithstanding this, however, some schools started to experiment with their pedagogical approaches.

The main emphasis of the evaluation in was on the outcomes of Phase 1 (MOS qualifications courses) through two full-year delivery cycles. Attempts to introduce Phase 2 (MCP qualifications courses) were also monitored, and have been briefly reported in this document, along with some discussion of schools' experience with CISCO and IC<sup>3</sup>. In 2002, data was gathered on participants' views on the set-up stage of the project. This has provided baseline qualitative data relating to the research questions on the robustness of the infrastructure.

## **Methodology**

### **EVALUATION STRATEGY AND OBJECTIVES**

The evaluation focused on reporting outcomes related to the following areas:

- student achievement.
- student retention.
- student employability.
- qualification transferability.
- qualification credibility.
- the robustness and suitability of the ICT Infrastructure.
- the impact on teaching and teaching staff.
- programme sustainability.

#### *Working Research Questions*

The primary research questions stated above were broken down into more focused questions to guide the research process. These questions included:

#### *Research questions related to students*

- Why did students chose to do the Microsoft qualifications courses?
- How successful were students in gaining the qualifications?
- Which groups of students tended to enrol in the courses, and gain the qualifications?
- Did participation in the courses influence students' career interests and ambitions?
- Did students seek or find employment on leaving school which used the ICT skills gained during the courses?
- Did students enrolled in the Year 12 ICT courses come back to do ICT qualifications in Year 13?
- Did the existence of the courses influence students' decisions about staying or leaving school?
- In what ways and how much did students apply learning from the Microsoft qualifications courses to their learning in other subject areas?
- To what extent did the overall profiles of participating students in relation to the previous questions vary according to gender, ethnicity, socio-economic background, academic record/interests etc?

#### *Research questions related to the qualifications*

- What was done during the pilot project in order to get the Microsoft qualifications accredited on the National Qualifications Framework?
- How easy was it to place the Microsoft qualifications on the National Qualifications Framework?

- How was the qualifications course regarded by other students in the schools, by parents and by prospective employers?

### ***Research questions related to the ICT infrastructure***

- How technically reliable and robust, over time, were the ICT systems put in place by the business partners?
- How much, and for what purposes, were the infrastructural technologies provided by the business partners used by the schools for purposes other than the provision of Microsoft qualifications courses?
- In what ways did any relevant content resources or communications tools provided through TKI contribute to the organisation and the teaching of the Microsoft qualifications courses?

### ***Research questions about the impact on teachers and teaching***

- To what extent, and with what effects, were the schools able to integrate or separate their teaching of the Microsoft qualifications with the teaching of other specialist ICT courses for other qualifications?
- How effective did the qualifications course tutors find the training and professional development offered by the business partners?
- How satisfied were the qualifications course tutors with the courses as they taught them?
- To what extent did the teaching staff in the pilot schools, other than those who taught the qualifications themselves, use the Microsoft qualifications training as a means of upskilling themselves as users of ICT?

### ***Research questions related to the sustainability of the project***

- To what extent, and under what conditions, did the stakeholders regard the project as sustainable in the pilot schools beyond the pilot phase?
- What lessons were learned from the pilot that could usefully inform any roll out of the scheme out to other schools and other school districts?

## **SAMPLING & DATA COLLECTION**

In selecting schools for the scoping interview/observation visits, the relative merits of a more detailed study of one or two schools in each region versus a more general study of all eight schools, were considered in preparing the research plan. On balance, it was thought that it would be better to gather a common set of data from all eight schools wherever possible. The reasons for this were:

- much of the data to be collected was quantifiable and a matter of school record,
- most of the research questions were best answered by generalising across, and maximising comparisons among, both regions and all school types and catchments (e.g. there were both single-sex and co-ed schools in each region, both low and mid decile schools in both regions, both state and integrated schools in one region etc),



- the social and pedagogical interactions of the ICT classes themselves were not a central focus of the evaluation, so prolonged observations of the ICT classes was not thought to be necessary.

Thus, as far as possible data was collected which was common across all eight schools, and related to the whole population of participating teachers and students. Data collected from all schools related to student records, the academic profiles of the student cohorts taking part, as well as the perspective of participating teachers. Problems with the multimedia delivery infrastructure prevented phase two of the project, the delivery of MCP training, from going ahead in the manner originally envisaged. This training was eventually given by face to face instruction to some students at the end of 2002.

As part of the scoping of the evaluation, the desirability was considered of comparing data relating to the MOS students' employability and career options on leaving school, with the general employability profile of other school leavers. A relevant question is whether the MOS group were more successful in getting technology related jobs than other school leavers. This could have been done by comparing the qualifications group profile with that of a 'matched' sample of other school leavers. Or it could have been done by comparing the qualifications sample with what records the schools keep on all of their students after the leave. Both of these presented practical difficulties, in that data on students' post-school activities was extremely hard to gather, and the schools involved had very varied systems in this regard. Keeping track of the qualifications group alone would have been time consuming enough given the limited budget. In the event, those 2002 Generation XP students who indicated their willingness to be followed up after leaving school were surveyed by phone in mid 2003.

An issue which was considered more important, and which related to students' attitudes to ICT was whether exposure to the courses resulted in changes in students' career aspirations. This question was addressed in the pre and post course surveys.

It was considered desirable to compare the qualifications group to the general profile of the school in relation to their academic profiles, - in order to determine whether or not the courses were attracting those who might otherwise leave school early, or leave school without much by way of qualifications. This was done for the 2002 intake of Generation XP students, where comparison of students' school certificate grades was comparatively simple. The introduction of Level 1 NCEA in 2002, with its more complex grading system, resulted in the decision in 2003 not to attempt to repeat the exercise of comparing students' MOS achievements with their academic performance.

Six visits to each school were made during 2002 and 2003. The first visit focused on meeting the schools' coordinators and discussing the research requirements, and concerns about the project. On each subsequent cycle of visits, the evaluator focused on observation; interviews of students, teaching and technical staff and principals; and reviewing school records, depending on the timing in the life cycle of the project.

During the first year of the evaluation, the evaluator also visited most of the other stakeholders in the project to conduct interviews. These visits were supplemented by phone or face to face interviews later in the lifetime of the project.

### *Data sources*

The evaluator negotiated access to a range of documents pertinent to the project and obtained permission for students to take part in the evaluation. Documents accessed included stakeholders' contracts; aspects of students' school records covering such things as their career aspirations, their academic record, and records of their progress in the qualifications. The evaluator also secured the

necessary cooperation to interview stakeholders' staff who were key to the project. In addition, other relevant adults, such as parents, were surveyed and/or interviewed.

Other sources of data included pre and post course written questionnaires given to students participating in the project, and observation notes taken during site visits. The final post course questionnaire in 2003 was administered and completed on line.

## **HANDLING THE DATA**

Quantitative data from surveys and data on student examination results were entered into *Excel* databases, and analysed using the graphing and other facilities included in the program. Face to face interview notes were handwritten or transcribed from tapes. Hard copy of digital data such as relevant e-mails etc were filed, and digital data securely stored on the evaluator's hard drive and on his allocation of the Christchurch College of Education network drive.

## **USING SOFT SYSTEMS METHODOLOGY TO INDICATE LESSONS LEARNT FROM THE PILOT**

Generation XP was a complex project which was conceived as a partnership between government, business and schools. The project was intended to address issues related to the '*digital divide*,' which was taken as referring to inequities between different socioeconomic groups in access, ability and attitude with respect to digital technologies. There is considerable debate about the nature of the digital divide and how to address it. In 2000, the government released papers concerning the divide. It was described as having aspects relating to physical access to ICT, ICT skills and support, attitudes to ICT and relevant online content. (Maharey and Swain, 2000). By extrapolation from overseas experience, it was believed to affect specific groups in New Zealand including Maori and Pacific people, women and girls, people on low incomes and those in rural areas. Warschauer (2002) critiques the usefulness of the notion of a digital divide and suggests that an alternative concept – that of technology for social inclusion – may be more useful.

The purpose of the present study was to evaluate the effectiveness of the Generation XP project, and to indicate lessons which may have been learnt during this initiative. These lessons may help in the further evolution and roll out of the present programme, or in the design and establishment of future similar partnership programmes. The project can be regarded as a '*proof of concept*' pilot and involved a diverse set of stakeholders and a range of objectives.

The evaluator chose to use Soft Systems Methodology to arrive at lessons and suggestions for future improvement of this and similar projects. Soft Systems Methodology is described in Appendix 1. The application of the methodology to the present project is given in Appendix 2.

## Research Findings

The research findings are categorised under the relevant research questions.

### RESEARCH QUESTIONS RELATED TO STUDENTS

#### Why did students chose to do the Microsoft qualifications courses?

In 2003, 266 responses were received to the question ‘*Why did you choose to work towards the Microsoft qualifications?*’ 477 responses to the same question were received in 2002. Reasons given for taking the courses are summarised in Table 1.

The responses given show that compulsion was the reason most commonly given for taking the courses. Two of the schools made the courses compulsory, and responses from these schools made up the bulk of the ‘compulsory’ answers (27% of all responses in 2002). There was an increased recognition of the value of the qualifications in 2003 compared with 2002, and a slight increase in the perceived value of the courses for students’ careers and futures. In 2003, less emphasis was placed on improvement of skills and knowledge than in 2002. Students appeared to be more focused in their reasons for taking the courses, with the percentage giving ‘other’ reasons for taking the course halving in 2003. There were some unexpected ‘other’ reasons for taking the courses. One student responded that the courses are ‘*better than writing!*’

**Table 1. Reasons given by students from all schools for taking MOS courses**

Reason	2003		2002	
	Number of Responses Citing this Reason	%	Number of Responses Citing this Reason	%
Compulsion or Part of Course Already Committed to	96	36	172	36
Help with Careers or Future	61	23	81	17
Qualifications	43	16	38	8
Improve skills or knowledge	24	9	72	15
Enjoyment or Interest	13	5	14	3
Other (Each $\leq$ 3%)	29	11	100	21
<b>Total</b>	<b>266</b>	<b>100</b>	<b>477</b>	<b>100</b>

The reduction in ‘*other*’ reasons could indicate an increased awareness of the benefits of these courses, and a consequent sharpening of students’ perception of the courses.

Whilst the figures given so far are the overall figures for all schools, reasons given by students from individual schools varied widely. This can be seen from Tables 2 and 3 which summarise the responses from School H and School G, both in Gisborne. The coordinator and teachers at school H enthusiastically promoted the MOS courses, and had an open and encouraging attitude to students taking the courses, whereas School G made the courses compulsory for all Year 12 students.

During interview, the most common responses given by students at school H to the question ‘*Why did you start studying for the MOS qualifications?*’ were related to career prospects in both 2002 and 2003.

It is interesting to note that in 2003, none of the respondents from school H gave compulsion as a reason for taking the courses, compared with 13.5% in 2002. Notable also is the threefold increase in percentage of students citing qualifications as a reason. An increased percentage gave ‘help with career or future’ in 2003. It was also interesting to note that the percentages citing increased skills and

usefulness of courses were lower in 2003. Far fewer students gave ‘other’ reasons for taking the courses.

**Table 2. Reasons given by students from School H for taking MOS courses**

Reason	2003		2002	
	Number of Responses Citing this Reason	%	Number of Responses Citing this Reason	%
Compulsion or Part of Course Already Committed to	0	0	9	13.5
Help with Careers or Future	12	30	13	19.5
Qualifications	13	31	7	10
Improve skills or knowledge	6	14	14	21
Enjoyment or Interest	4	11	7	10
Utility of courses	4	11	7	10
Other (Each ≤ 3%)	1	3	10	15
<b>Total</b>	<b>40</b>	<b>100</b>	<b>67</b>	<b>100</b>

The responses from students at School G, where the courses were compulsory, were in stark contrast to those from School H. The vast majority of responses for both years were that the course was compulsory (89% and 81% for 2002 and 2003 respectively). In 2002, none of the students mentioned qualifications or help in their careers or futures as a reason. In 2004, 3 students mentioned qualifications and 4 cited career or future as a reason. This could indicate the beginnings of a realisation of the potential value of the courses.

Some degree of resentment regarding the compulsory nature of the courses was suggested by responses such as ‘It’s compulsory. It does (sic) even relate to what I wanna be when I’m older’ and ‘I had to do it at school. We didn’t choose to do this course. We’re like guinea pigs.’

**Table 3. Reasons given by students from School G for taking MOS courses**

Reason	2003		2004	
	Number of Responses Citing this Reason	%	Number of Responses Citing this Reason	%
Compulsion or Part of Course Already Committed to	65	81	92	89
Help with Careers or Future	4	5	0	0
Qualifications	3	4	0	0
Improve skills or knowledge	0	0	0	0
Enjoyment or Interest	0	0	0	0
Usefulness of Courses	4	5	5	5
Other (Each ≤ 3%)	4	5	6	6
<b>Total</b>	<b>80</b>	<b>100</b>	<b>103</b>	<b>100</b>

These findings indicate that students in this school increasingly appreciated the potential value of the MOS qualifications, and the value of the courses to their futures. This could have resulted from the fact that the school was a leading school in the number of students qualifying in 2002, and had

achieved eight MOS Master qualifications by early in 2003. One of these Masters was given a free trip to Florida to an international convention of MOS Masters. Another factor could have been that several of the successful MOS students secured prestigious part time employment which used their skills.

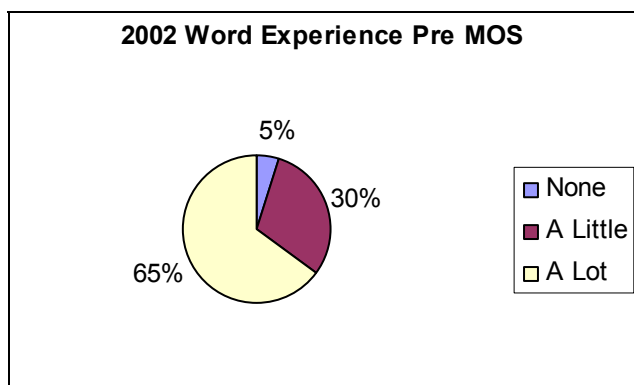
### Summary

1. In 2003, increased overall percentages of students cited qualifications or value of the courses to their future or careers, (39% compared with 25% in 2002) and less mentioned increased skills or knowledge as reasons for studying MOS (9% compared with 15%). Within these findings, there was considerable variation between schools. One of the leading MOS schools had a threefold increase in the percentage of students citing qualifications in 2003, and a 50% increase in those citing career or future reasons.
2. Two schools made the courses compulsory. This resulted in compulsion being given as the most common reason for taking the courses. In these schools in 2002 there was no mention of qualifications or future benefits as reasons, and only minimal mention in 2003.
3. There was evidence of student resistance to the compulsory nature of the courses in some schools.

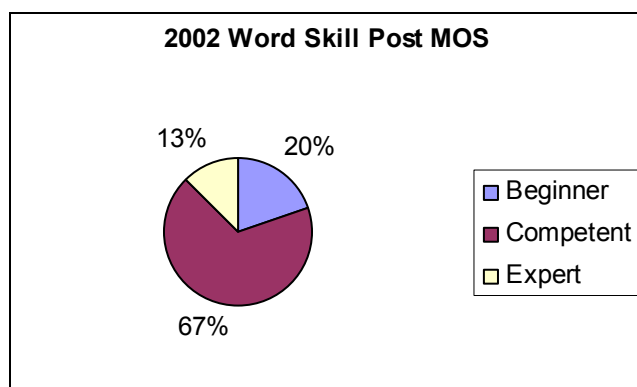
### How successful were students in obtaining the relevant skills and gaining the qualifications?

At the beginning of 2002, students were asked to rate their level of experience with the MOS component programs, - Microsoft *Word*, *Excel*, *Access*, *Power Point* and *Outlook* as *none*, *a little* or *a lot*. They were also asked to rate their competence with the programs in the exit survey as *beginner*, *competent* and *expert*. In the case of Microsoft *Word*, 65% of the responses indicated that students had had '*a lot*' of experience with the program prior to taking the courses. This translated into 80% of the respondents to the exit survey believing that they were competent or expert users of the programs at the end of the MOS courses (Figures 1 and 2). A similar trend was seen with Microsoft *Excel* where 35% of students claiming to have had '*a lot*' of prior experience translated to 61% claiming competence or expertise with this program at the end of the courses. Similar trends were seen for *Power Point*.

**Figure 1. 2002 Students' *Word* Experience Prior to MOS Courses**



**Figure 2. 2002 Students' Word Skills after MOS Courses**



Not all the schools taught the *Access* and *Outlook* modules. The findings for these programs are less clear cut. However, at the end of the 2002, 48% of MOS students claimed competence or expertise with *Access*, and 35% with *Outlook*. Thus one important outcome of the pilot seems to have been a significant increase in skills in using these programs among nearly 700 students. This observation is supported by comments of MOS coordinators and teachers, although no objective measures of competence, other than the Microsoft qualifying tests have been carried out.

Several different approaches were used to estimate the overall success of students in gaining MOS qualifications. Schools provided data on the MOS examination statistics for their students. In 2002, data were obtained from Certiport, the examining company in the United States by courtesy of Computer Press Ltd, and students reported their success rates in the end of year surveys. During the period to March 2003, 119 students took MOS examinations. No students who newly enrolled in 2003 had taken any of the examinations at that date, so this data represents the number of passes for the first year's group of students. This number of examination candidates represents approximately 17% of the 2002 intake of 687 students. 71 students passed one or more of the component examinations (10% of the intake). This represents a 59% pass rate of the students who sat exams. Thus the overall number of students passing MOS examinations was low, but the ultimate pass rate for those taking the examinations was over 65%. This pass rate represents the percentage of candidates who eventually gained a qualification after one or more attempts.

It proved very difficult to obtain data on MOS examination results from some schools in 2003. Despite periodic requests, one school did not provide information by the end of the year, and data from other schools was patchy. In 2002 it was possible to obtain information on examination results from Certiport with the help of Computer Press Ltd. Certiport changed their reporting procedures early in 2003, and it was no longer possible to access results in this way. Schools were able to access their results directly, but only those results which had been recorded during the period of 60 days prior to such a request. The evaluator was informed by Computer Press that Certiport received a large increase in requests from educational institutions worldwide for certification information, and was '*beefing up*' its reporting capabilities for academic institutions.

The evaluator was notified of 57 students who took MOS examinations in 2003. This was from a total of 274 MOS students. Thus the apparent percentage of students in 2003 who took MOS examinations was somewhat higher (20.5%) than in 2002. Very few of these were Maori or Pacific students. 36 of the students were reported as obtaining one or more MOS passes (13%), again slightly higher than in 2002. This represents a 63% pass rate for the candidates. Because of the lack of data from some schools, these figures could underestimate the real situation. The pass rate per examination taken varied from 0% for two schools in Gisborne to 100% in another Gisborne school, where only two students were reported as taking and passing MOS examinations. This latter percentage figure is

misleading, since the school’s coordinator reported that the IBM computers had been out of action for all of terms 3 and 4, and that *‘I have asked whether there is any more detailed record, but you should assume, given the technical difficulties encountered, that these were the only tests attempted and that the students passed first time.’* In 2002, this school also reported no failures in the MOS examination, but had one of the lowest pass rates per enrolled student. It may be that the school only put forward as candidates students who they were sure would pass. The other three schools had apparent pass rates of 25% (two schools including the Gisborne lead school) and 67%. One teacher at the lead school passed two units in 2003.

In 2003, two schools reported results for the IC<sup>3</sup> qualification. A total of 16 students were reported as taking 26 examinations, with 12 passes.

The 2002 MOS pass rate was examined in more detail and related to individual schools. There was a wide variation in the total number of students passing MOS components from school to school. School D achieved a total of 20 students who passed MOS components, whilst School F achieved only 4. (Table 4) The number of students passing did not reflect the total number of students taking the courses in the school – School D students returned 67 entry surveys, and School F 89 forms. One major difference between the schools was that School F made the courses compulsory for all Year 12 students. The course in School D was an optional extension to pre-existing courses, and the coordinator *‘went the extra mile’* in supporting her students. School H, which ran the courses as an option and whose students received excellent support and encouragement, had 16 successful students from a total of 92 survey respondents. The remaining schools had 6 to 8 successful students.

Schools H and D recorded the highest numbers of individual MOS passes – 60 and 58 respectively, whilst School F scored the lowest with eight. The remaining schools scored between 12 and 22.

The average number of individual MOS passes per successful student did not vary so widely, lying between 2.5 and 3.7 in all the schools. The highest averages were for School H (3.8 passes per successful student) and School A (3.7 passes). School A had a policy of only allowing students who were almost certain to pass the examinations to take them, in order to avoid *‘wasting’* examination vouchers.

Finally, the number of MOS passes per Generation XP enrolled student again varied widely. The lowest numbers were recorded by School F (<0.1) and School G (0.12). Both these schools made the MOS courses compulsory for Year 12 students. The highest number was recorded by School C. However, this figure is not comparable with the others, since this school appeared to follow a policy of only counting MOS examination candidates as enrolled in the MOS course. Excluding School C, the highest numbers of passes per enrolled student were achieved by School D (0.87), School H (0.65) and School E (0.52)

**Table 4. Illustrative Data on Students’ MOS Examination Achievement**

School	Number of Students Returning Entry Survey	Number of Students passing one or more MOS components	Total Number of Components Passed	Number of MOS Passes per GenXP Enrolled Student
D	67	20	58	0.87
F	88	4	8	<0.1
H	91	16	60	0.65

During the period to March 2003, School H achieved the distinction of training 8 MOS Masters. In order to achieve this qualification, students had to pass qualifying examinations for *Access*, *Power Point* and *Outlook*, and for *Word* and *Excel* at Expert level. One of this school's MOS Masters was flown to Florida to take part in an international convention at Microsoft's expense. Other schools which achieved MOS Masters were School A (2) and School D (1).

There appeared to be many factors which influenced the performance of students of individual schools in the MOS examinations. A significant negative influence was making the courses compulsory. The two schools which followed this policy performed poorly against several criteria. These schools also appeared to have less qualified and/or less committed staff teaching the courses. Thus School G, which made the courses compulsory, had the largest number (90) of students return entry surveys during 2003. However, the school reported no passes during the year. The school's coordinator reported that the course had '*imploded*' and effectively ceased to operate in the school during 2003. The evaluator had been present during a class in which the teacher, who had received no specific training to run the courses referred to the content as '*boring*' when addressing the class. Student and parent feedback on the courses was the most negative of all the schools. Schools which performed well had courses which were significantly optional in nature. Staff at these two centres made extra efforts to support their students, by sourcing or producing extra resources, and by consistent positivity and encouragement.

## Summary

1. 80% of students surveyed claimed competence or expertise with Microsoft *Word* and 65% made the same claim with *Excel*, after the MOS courses. Students also gained good skills with *Access*, *Power Point* and *Outlook*
2. In 2002, 71 students (10% of enrolments) passed one or more MOS examinations. The figure for 2003 was 36 (13%)
3. Making the courses compulsory had a negative effect on student candidacy and success in MOS examinations.

## Which groups of students tended to enrol in the courses, and gain the qualifications?

Fewer students enrolled in the training in 2003 (292 survey responses) compared with enrolments in 2002 (620 responses) (Table 5). This may have been partly due to lack of publicity and also to lack of support within the schools. Many other factors may also have contributed to this including the fact that the qualifications were not registered or credit included towards NCEA until late in 2003, difficulties schools reported in running MOS courses in parallel with established courses leading to Unit Standards, and the perceived unsuitability of the curriculum and course materials for New Zealand school students.



**Table 5. Numbers of responses to entry surveys from each school**

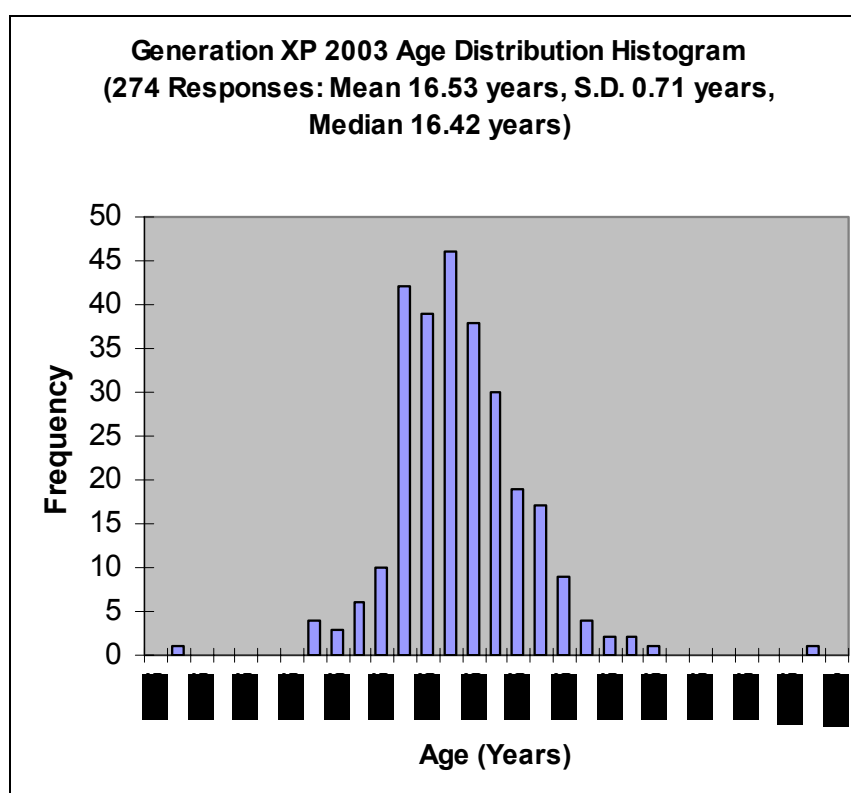
School	Type	2002		2003	
		Number	Percentage	Number	Percentage
A	Single sex boys'	96	15	16	5
B	Single sex girls'	69	11	23	8
C	Coeducational	10	2	26	9
D	Coeducational	67	11	24	8
E	Coeducational	34	5	27	9
F	Single sex boys'	89	14	46	16
G	Single sex girls'	166	26	90	31
H	Coeducational	92	15	40	14
<b>Totals</b>		<b>620</b>	<b>99</b>	<b>292</b>	<b>100</b>

When broken down by schools, all schools recorded a drop in numbers involved except School C. This school had internal problems during 2002. These resulted in the project not getting fully under way until 2003. Table 5 summarises the numbers of responses received from each school. It also gives these numbers as percentages of the total number of responses for each year.

In 2002, 54% of the Generation XP students were female, whilst in 2003, this percentage had increased to 61%. This may in part have arisen because the percentage of total responses from one single sex boys' school (A) dropped by 10%, whilst the percentage from a single sex girls' school (G) increased by 5%.

Age statistics for the 2003 cohort are shown in the histogram in Figure 3.

**Figure 3. Generation XP 2003 Age Distribution**



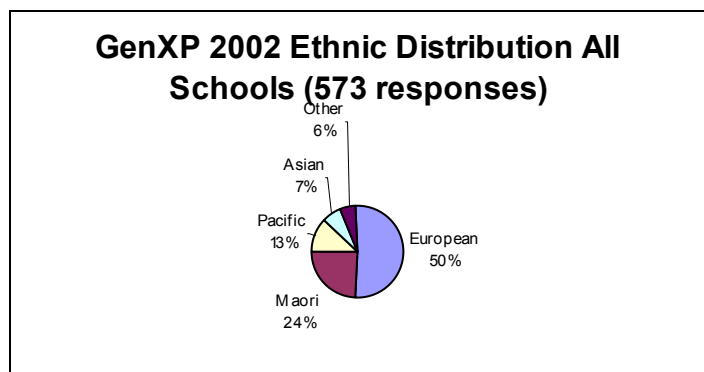
The age data for 2002 showed a similar distribution, with a mean of 16.5 years, median of 16.42 years and standard deviation of 1.2 years. 557 responses were included in the 2002 analysis. The 2002 data differs from the 2003 data in including four students under the age of 13 years, and four adults over 19 years of age. Two of these were teachers aged 24 and 36 years.

Students were asked to indicate with a tick their ethnicities, being offered the choice of: 1. *Pakeha/European*, 2. *Maori*, 3. *Pacific*, 4. *Asian* or 5. *Other*. They were asked to tick only one choice. In fact, of the 573 students responding to this question in 2002, 96 ticked two or more choices. The corresponding figures in 2003 were 291 responses with 27 ticking two or more. In order to simplify analysis, all respondents who had ticked choice 1 were counted as of European ethnicity, Those who had not ticked 1, but had ticked 2, and either 3, 4 or 5 were counted as Maori and so on. It is acknowledged that this procedure may underestimate the percentages of Maori and Pacific students and over estimate the percentages of European students.

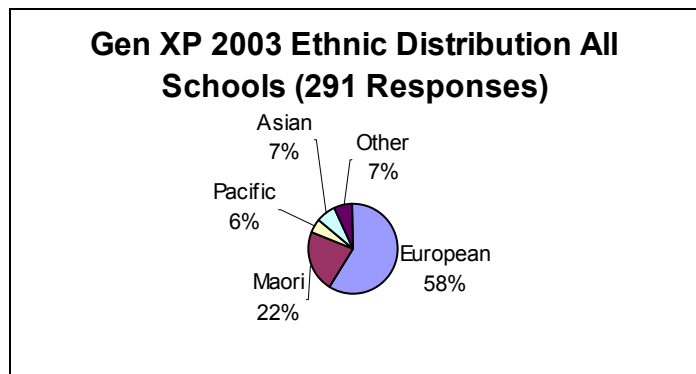
The overall ethnic distributions for the two years are shown in Figures 4 and 5. Half of all the students in 2002 were of European ethnicity. In 2003, this proportion had risen to 58%, with a concurrent drop in the number of the Pacific students. These figures for the whole population of 16 year old students in New Zealand schools are shown in Figure 6 (Ministry of Education , 2001b).

Thus it is apparent that the percentage of European students enrolled in both years of the Generation XP project is lower than that in the nation’s school population of 16 year olds, and that the percentage of Maori is higher. The percentage of Pacific students involved in the project was nearly double the national average in the first year of operation, but had dropped back to around the national average in 2003. Asian representation remained at around the national average in both years, whilst the percentage of *other* ethnicity students appeared higher than the national figure. These differences were a consequence of the choice of areas in which the pilot schools were located.

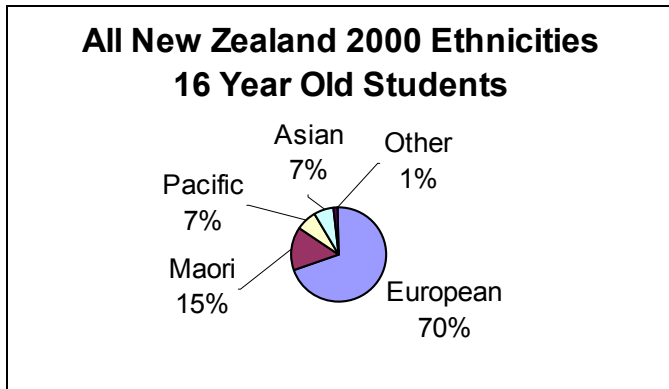
**Figure 4. Overall Generation XP 2002 Ethnic Distribution**



**Figure 5. Overall Generation XP 2003 Ethnic Distribution**

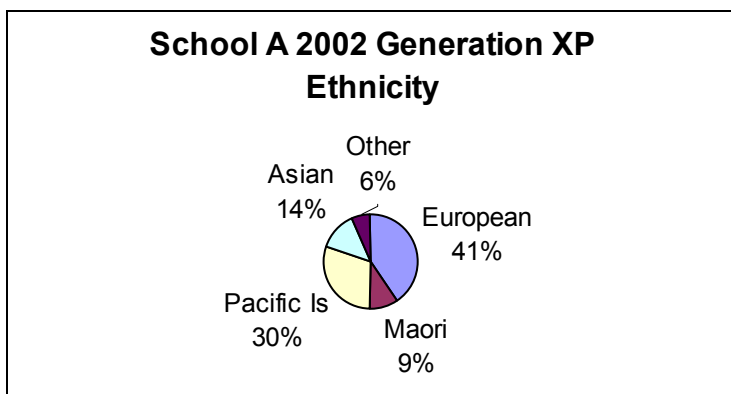


**Figure 6. 2000 Ethnic Distribution of 16 Year Old Students in All New Zealand Schools**

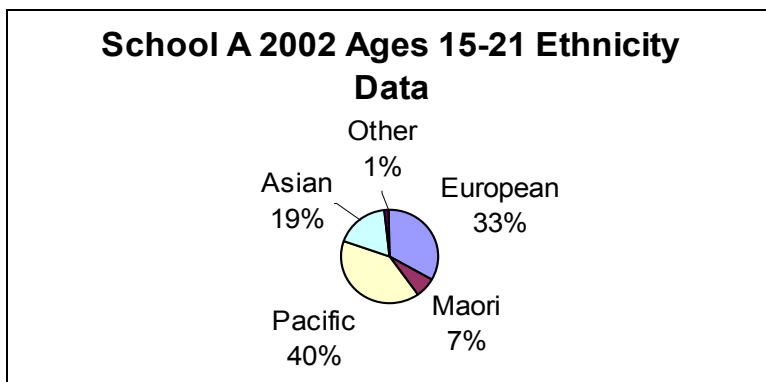


A different picture emerged when the ethnic distribution of students was compared with the overall ethnic distribution of senior students within the pilot schools. There were considerable variations between schools, but the pattern was often that European students seemed to be over represented compared to Maori and Pacific students. Figures 7 to 10 show 2002 ethnicity distributions for School A, a school in West Auckland and School H, in Gisborne. The data in Figures 8 and 10 give the ethnicity distributions of all the schools' students within the senior schools obtained from school records (15-21 years of age or Years 11-13, depending on the way each school presented their ethnicity data), and data in Figures 7 and 9 are from students' Generation XP entry surveys. The pattern appeared to have been repeated in 2003, although detailed ethnicity data for year 2003 were not examined.

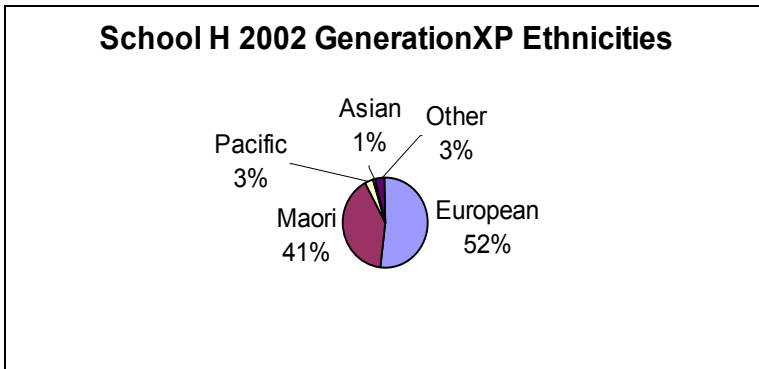
**Figure 7. School A Generation XP Ethnicities**



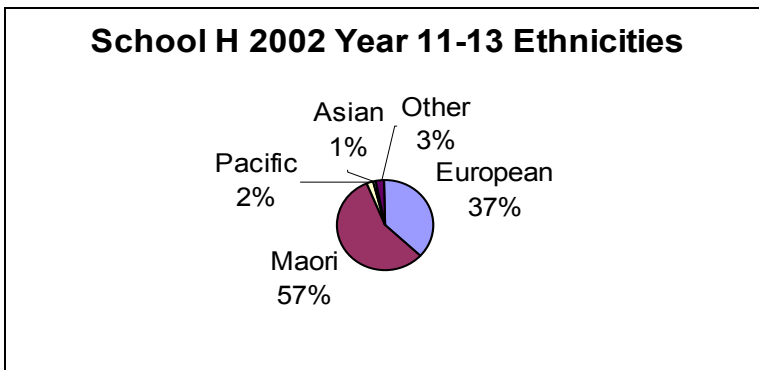
**Figure 8. School A Ages 15-21 Ethnicity Data**



**Figure 9. School H Generation XP Ethnicities**

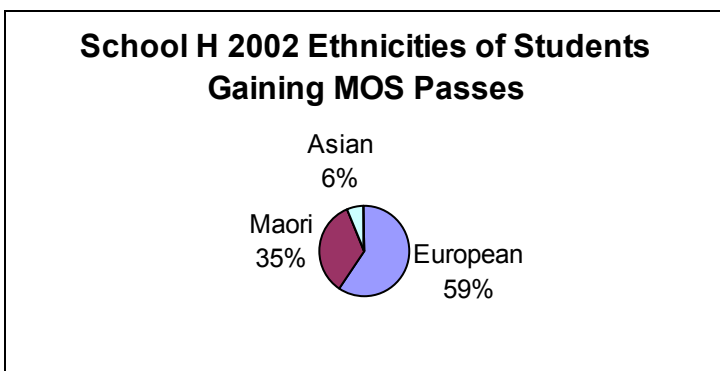


**Figure 10. School H Year 11-13 Ethnicities**

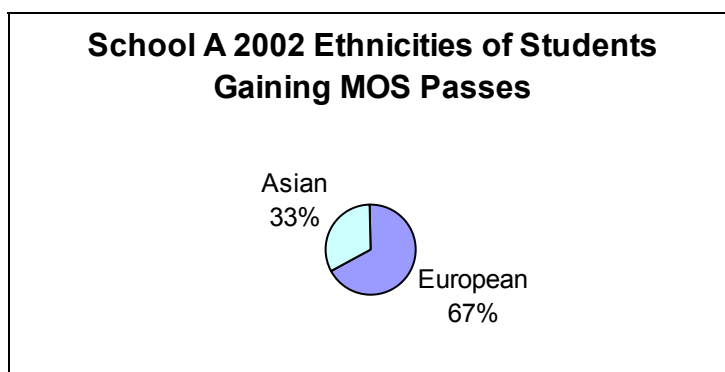


In all schools, the percentages of Maori and Pacific students passing one or more MOS components were very low. In five of the schools, no Maori or Pacific students gained any passes during 2002. Even in School H, which had the highest Maori participation rate, and the greatest number of MOS passes, the percentage of Maori students who sat the exams and succeeded in passing was only 35%. (Figures 11 and 12). The only Pacific student in the pilot who gained a pass claimed mixed European/Maori/Pacific ethnicity.

**Figure 11. School H Ethnicities of Students Gaining MOS Passes**



**Figure 12. School A Ethnicities of Students Gaining MOS Passes**



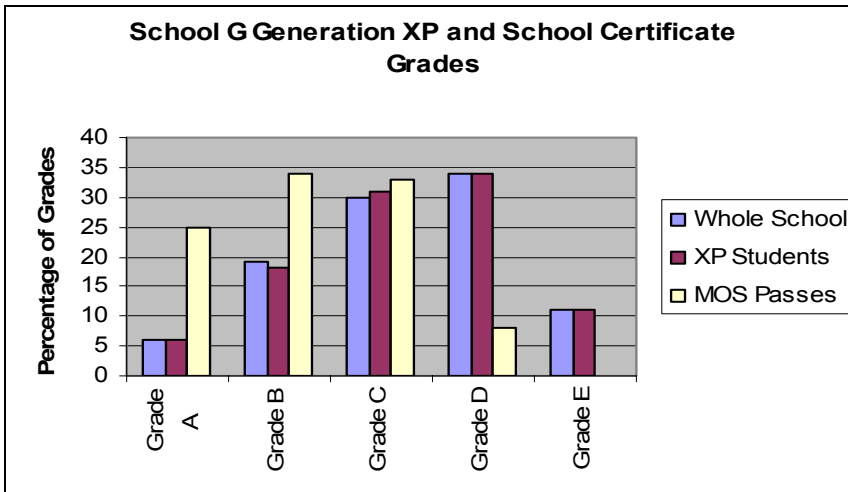
Because of the unreliability of the 2003 figures for MOS examination results, no detailed analysis was made of the ethnicities of MOS candidates for this year. However, it appeared that the representation of Maori and Pacific students amongst the exam candidates was again low.

2001 was the last year in which students in Year 11 took School Certificate examinations. This group flowed through and made up the bulk of the 2002 Generation XP cohort of students. The 2001 School Certificate grades of the Generation XP students were compared with those of their peers. This was done by calculating the number of grade A, grade B etc scores as percentages of the total number of grades for the whole school in 2002, and repeating the calculation for the Generation XP students and for those gaining one or more MOS passes in 2002.

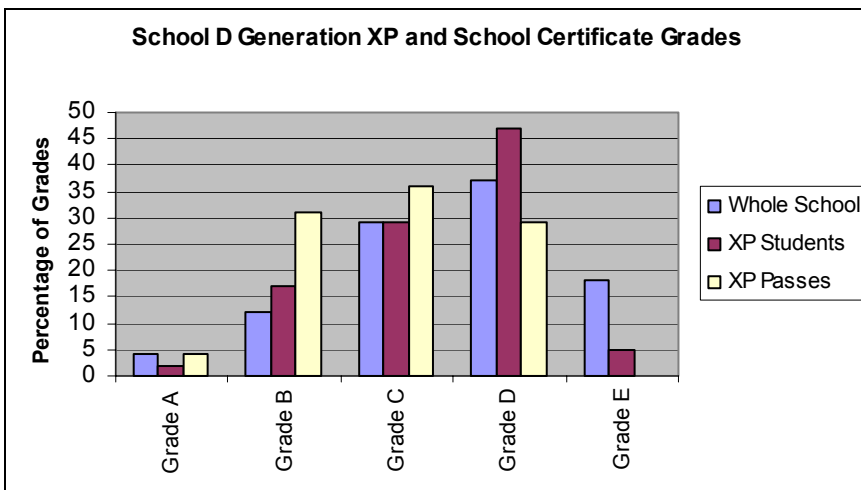
In almost all the schools, there was a close correlation of School Certificate grade percentages of the XP students with those of the whole school. The most significant exceptions were School E, an integrated school which was the highest decile school in the study, and School C. School E appeared to discourage its most academically successful students from taking the MOS courses, whereas school C had a very low number of students (10) in the project in 2002. The correspondence between whole school School Certificate grades and those of the Generation XP cohort was closest in the schools which made the MOS courses compulsory.

The comparison of students' MOS achievements with their School Certificate grades was a straightforward although tedious task. Comparison of the School Certificate grades of students passing one or more of the MOS examinations with the whole MOS cohort within the school indicated clearly that in all schools, it was the more academically able students (as judged by their School Certificate grades) who clearly dominated the MOS exam passes. This is clearly shown by comparison of the School Certificate grades for students at schools D and G. (Figures 13 and 14). For example, for School D, only one in 20 School Certificate grades gained by all the school's students, or by all the Generation XP students were Grade A. However, one in four School Certificate grades were As for students who subsequently achieved one or more MOS passes. In no school did any of the students who had obtained an E in School Certificate gain a MOS pass.

**Figure 13. School G Generation XP and School Certificate Grades**



**Figure 14. School D Generation XP and School Certificate Grades**

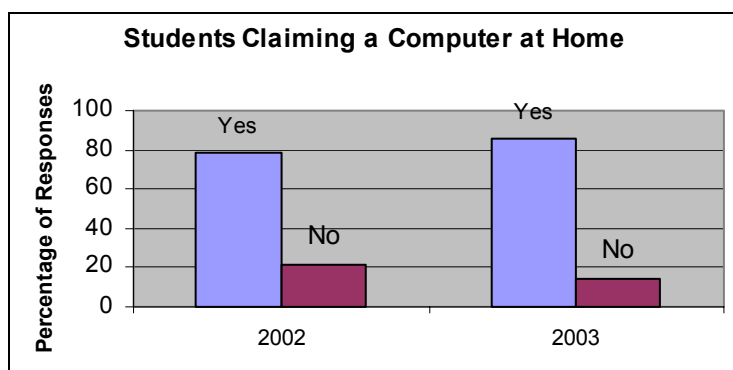


Far fewer students had sat MOS examinations in 2003 by the time of writing (November 2003) than at the same time in 2002. In addition, the task of making similar comparisons using NCEA results was perceived to be much more complex than that using School Certificate results. As a consequence, a similar comparison was not made for the 2003 students using NCEA Level 1 results.

When MOS teachers and coordinators were asked which students succeeded in gaining the qualifications, most of them said that the successful students tended to be the more able and motivated. This response was obtained in both 2002 and 2003. The coordinator from school H, who appeared to offer a very high level of support and encouragement to his students, differed somewhat, saying that *'overall (the students who succeed are) those who are prepared to put in the work as much as those who have ability...Diligence is significant and perseverance is important.'*

The percentages of students claiming to have computers at home were surprisingly high in both years' entry surveys (Figure 15).

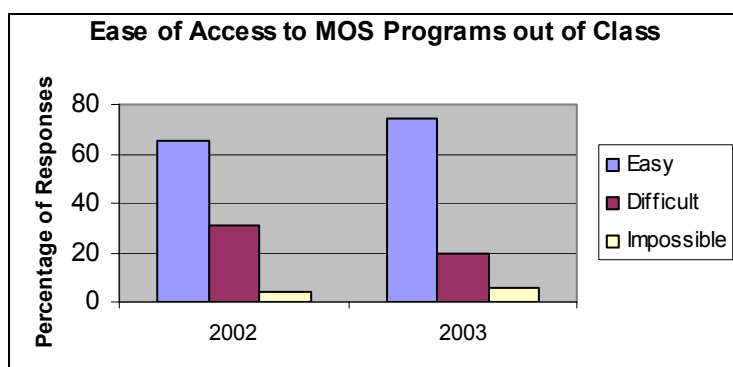
**Figure 15. Students Claiming to Have a Computer at Home**



Students were also asked how easy it would be for them to access the MOS computer programs out of class. Responses show that for the vast majority of students, access to the programs would be easy (Figure 16).

Both the percentage of students claiming to have computers at home, and those claiming to have easy access to the programs outside class increased from 2002 to 2003. This seems to indicate that there was little barrier to accessing the technology for the majority of the students.

**Figure 16. Students' Claims Concerning Ease of Access to MOS Programs Outside Class**



## Summary

1. Gender distribution: In 2002, 54% of the Generation XP students were female, whilst in 2003, this percentage had increased to 61%.
2. Age distribution: The age distribution of Generation XP students in both years was similar with a mean age of 16.5 years in both years, and a standard deviation of 0.7 years in 2003 and 1.2 years in 2002.
3. Ethnicity: The overall percentage of European students enrolled in both years was less than the national average for 16 year old students, reflecting the diversity within the communities of the participating schools. A higher percentage of European students enrolled overall in 2003 compared with 2002. The increase coincided with a decrease in the percentage of Pacific students. However, within the participating schools, it appeared that European students were over represented compared with Maori and Pacific students. Percentages of Maori and Pacific students passing the examinations were very low. Passes were dominated by European and Asian students, with Asian students performing best in proportion to their numbers within the schools.

4. Academic achievements: The distribution of 2001 school certificate results amongst Generation XP students in most schools was similar to the distribution amongst the school as a whole. However, in all schools, the more academically able students dominated MOS examination passes.
5. There appeared to be no barrier to out of class access to computers or to MOS programs for the vast majority of the students.

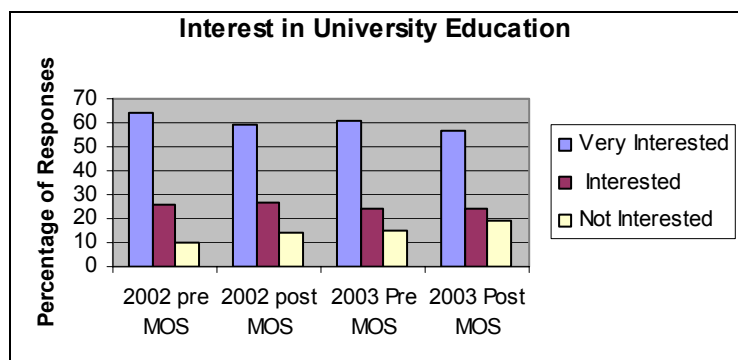
### Did participation in the courses influence students' career interests and ambitions?

Each year, students completing the entry and exit surveys were asked a set of multiple option questions relating to future career and education interests. The questions asked students what types of work they were considering after leaving school. They were given 22 career categories, based on the Work and Income New Zealand classification. Students were asked to indicate their interest level in each category by ranking the categories 1: *very interested*, 2: *interested*, 3: *not interested*. The numbers of responses for each ranking and for each occupation category were collated and graphed. The only consistent trend appeared to be a reduction in interest in several occupation categories. Biggest drops in interest during 2002 appeared in the more ‘physical’ occupations such as *transport and storage*, *engineering* and *construction and utilities*. These areas recorded drops of up to 40% in the *very interested* and *interested* categories. Similar drops were not recorded in 2003. For example, there was a threefold increase in the percentage of *very interested* responses for *construction and utilities*, perhaps reflecting the 2003 property and construction boom in Auckland. *Business and property services* also recorded an increase in the *very interested* category during 2003.

All categories of further and tertiary education recorded high levels of interest, with *very interested* and *interested* accounting for 90% of responses for *university education* on the entry surveys, and 86% on the exit forms in 2002. This pattern was repeated in 2003 (Figure 17). It was consistent with high percentages of Generation XP students intending to return to school in the year following their involvement with the MOS training (between 66 and 76% in the four surveys).

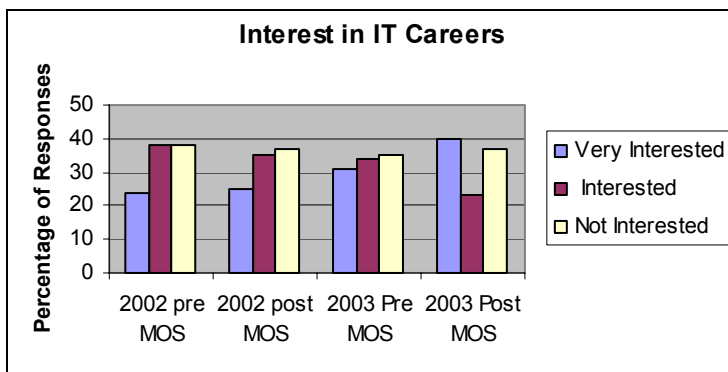
In 2002, there was no change in interest in *information technology* occupations between the pre and post surveys. (Pre: *very interested* – 24%, *interested* – 38%, *not interested* 38%; Post: *very interested* – 25%, *interested* – 38%, *not interested* 37%) A higher percentage of students appeared *very interested* in the 2003 entry survey. This percentage increased noticeably in the 2003 exit surveys, at the expense of the *interested* category. The *not interested* categories were similar throughout all four surveys (Figure 18).

**Figure 17. Students’ Interest in University Education before and After MOS Courses**

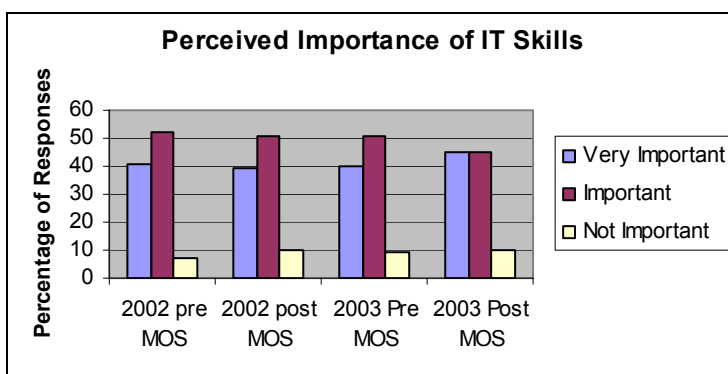




**Figure 18. Students' Interest in Information Technology Careers before and after MOS Courses**



**Figure 19. Students' Perceptions of the Importance of IT Skills for Employment**



The increase in the *very interested* category for IT careers in the 2003 pre MOS survey may result from an increase of awareness of ICT within the schools as a result of the project, and the further increase in this category after the courses could be due to students' appreciation of the value of the MOS training. This could be consistent with a slight increase in students' perception of IT skills as *'very important'* for employment (Figure 19).

A further conclusion from studies of students' career interests was that there was no measurable change in students' attitudes to various other potential occupation types as a result of taking the MOS courses during 2003.

### Summary

1. There was no difference in students' interest in IT as a career between the entry and exit surveys in 2002.
2. On entry, a higher percentage of students in 2003 responded that they were *'very interested'* in IT as a career. This percentage increased noticeably in the 2003 exit survey, with a concurrent decrease in the *'interested'* category.
3. The percentage of students who thought that IT skills were *'very important'* for employment also increased slightly during 2003.
4. Percentages of respondents who were *'not interested'* in IT careers; or who thought that IT skills were *'not important'* for employment remained substantially constant over the four surveys.

5. Generation XP students showed a high degree of interest in further and tertiary education after leaving school. In all four surveys 57% or more respondents were 'very interested' in university education.

### Did they seek or find employment on leaving school which used the ICT skills gained during the courses?

At the end of 2002, MOS students were balloted to find out who would be prepared to take part in a follow up phone survey in 2003 for the purpose of finding out how useful the courses had proved to be. Another aim of the follow up was to determine whether former MOS students found employment which used their MOS skills.

91 of the follow up ballot forms were returned. None were received from schools D and G. 47 students agreed to be interviewed in 2003. Many of these proved difficult to contact for follow-up, and several no longer wished to be interviewed when contacted. In the event, 17 completed interviews.

Fourteen of these respondents were still students, and only two in employment. One was looking for work. One of the employees was a school computer technician, and the other worked in a fish and chip shop. Of the fourteen students, six were in tertiary institutions, seven were still at school, and one attended a private computer training organisation. All but one of the tertiary students were studying business and/or computer related courses. The exception was taking a nursing degree.

Twelve of the interviewees reported using their Microsoft *Word* skills, five each used *Excel* or *Power Point*, and one *Outlook*.

Nine of the interviewees used their MOS skills in preparing assignments or other documents, two found them useful for personal or day to day use, and one used them in self paced study, saying that he would be able to 'complete in half the time.'. Four had mentioned involvement with the MOS courses in their *curricula vitae* or during interviews. Three of the ex MOS trainees thought that their Microsoft skills helped them to get a job or to obtain access into tertiary courses. Three of the ex MOS students were interested in IT linked careers, whilst only two of those who were still students had applied for jobs – both in the retail sector.

During 2002, several students from Gisborne schools obtained part time work which used their MOS skills. Students from one school were employed by Tairawhiti Polytechnic as computer tutors, and another worked with computer assisted design at a local boatyard. Others used spread sheeting or *Word* processing in their part time work. Gisborne students continued to be similarly employed in 2003.

School coordinators in West Auckland schools were not aware of students' using their MOS skills in part time employment.

### Summary

1. It proved difficult to follow up MOS students after they had left school. In the event it proved possible to interview only 17 ex-students.
2. Only one of the interviewees was in employment in an IT based occupation.
3. Thirteen were involved in tertiary study leading to computer or business qualifications.

4. Most interviewees reported using MOS skills for a range of purposes including preparing assignments, and personally.
5. Some had mentioned the MOS courses in CVs or at interview, or thought that Microsoft skills had helped them to obtain jobs or entry to tertiary study.
6. Students from Gisborne schools undertook a range of part time work which used their MOS skills.

### Did students enrolled in the Year 12 ICT courses come back to do ICT qualifications in Year 13?

Of the 282 students who returned the entry survey at the beginning of 2003, 71% had not previously studied the MOS courses. The remaining 29% (83 students) had studied the courses in 2002. In 2002, 292 students (42.5% of Generation XP students) had stated that they intended to return in 2003 and continue studying MOS courses.

#### Summary

1. Nearly 30% of the students studying MOS courses in 2003 had been taking the courses the previous year.

### Did the existence of the courses influence students' decisions about staying or leaving school?

During the entry survey, students were asked the question 'How important was the opportunity to study for the Microsoft qualifications in your decision to stay at school this year?' In 2002, 17% of respondents rated the qualifications as 'very important,' and 49% as 'important'. The figures for 2003 are similar – 14% and 47% respectively. These data may be unreliable since in both 2002 and 2003, several interviewees from different schools said that they had had minimal or no information about the courses before they actually started.

#### Summary

1. Over 60% of students in each year rated Microsoft qualifications as '*very important*' or '*important*' in their decisions to stay on at school.

### In what ways and how much did students apply learning from the Microsoft qualifications courses to their learning in other subject areas?

In the entry survey for 2002, 40% of the students thought that that the Microsoft courses would help '*a lot*' with their learning in other subjects, 52% responded '*A little*', whilst 8% responded '*not at all*'. Figures for 2003 were similar – 33%, 57% and 10% respectively. In the exit survey in 2003, corresponding figures were somewhat lower. 23% of students who responded to the question '*How much has taking the Microsoft courses helped your learning in other subjects?*' responded '*a lot*', 56% responded '*a little*' and the remainder '*not at all*'. These figures are very similar to those obtained in 2002.

At interview, many of the students said that they used their Microsoft skills in other school subjects. Most commonly mentioned applications were *Word*, for assignment and project work, *Excel* for mathematics, accounting and analysis of data from science projects and experiments and *Power Point*

for making presentations. Their comments were echoed by the MOS teachers. For example, a teacher from School A commented in October 2003: '*(the students are) comfortable with the applications and are familiar with their options. The computer is now regarded as a tool. This is a significant change from when the project started.*' Another teacher from School G mentioned his students' use of *Power Point* in preparing an award winning Young Enterprise Scheme presentation.

Those ex MOS students who were interviewed during 2003 also commented on their use of Microsoft skills in the preparation of assignments and other documents.

The evidence was thus that Microsoft skills learnt during MOS courses were widely applied in other learning areas, both within the schools and subsequently.

## Summary

1. 90% of students anticipated that MOS courses would help their learning in other subjects to a greater or lesser extent. After the courses, around 80% of students claimed that MOS courses had been helpful.
2. Students consistently reported that they used *Word* for assignments, *Excel* for mathematics, accounting and data processing and *Power Point* for presentations
3. Students increasingly regarded the MOS applications as useful everyday tools.

**To what extent did the overall profiles of participating students in relation to the previous questions vary according to gender, ethnicity, socio-economic background, academic record/interests etc?**

No consistent trends were found in relation to this research question.

## RESEARCH QUESTIONS RELATED TO THE QUALIFICATION

**What was done during the pilot project in order to get the Microsoft Qualifications accredited on the National Qualifications Framework?**

**How easy was it to be to place the Microsoft Qualifications on the National Qualifications Framework?**

During the course of the evaluation, it became clear that these particular research questions were inappropriate. New qualifications must first be registered on the New Zealand Register of Quality Assured Qualifications before they can be accepted for credit inclusion towards the National Certificate of Educational Achievement. The research questions were hence reformulated as:

**What was done during the pilot project in order to get the Microsoft Qualifications registered on the New Zealand Register of Quality Assured Qualifications and accepted for credit inclusion towards the National Certificate of Educational Achievement?**

**How easy was it to register the Microsoft Qualifications on the New Zealand Register of Quality Assured Qualifications and to have them accepted for credit inclusion towards the National Certificate of Educational Achievement?**

On 25 July 2002, the New Zealand Qualifications Authority, the Ministry of Education project manager and a representative of Microsoft Ltd held discussions about how to proceed to make credits for Microsoft courses available to contribute to the National Certificate for Educational Achievement (NZQA (2003)). This was one of the key objectives of the Generation XP pilot.

At the time, it was agreed that the way forward would be to work through a registered provider, which would make application for the courses to be approved for inclusion on the Register, and for credit inclusion towards NCEA. The provider selected by Microsoft, and which made the application was ACE Training Ltd of Auckland.

In order to carry out the application, this provider had to map the Microsoft curriculum and qualifying tests with pre existing qualifications which were already on the Register and/or Framework. This involved scanning over one hundred qualifications, and closely comparing the Microsoft material with sixteen pre-existing qualifications to which the Microsoft material closely corresponded. There were challenges in that the pre existing unit standard qualifications were somewhat ‘fuzzy’ and ill defined, in comparison to the very specific nature of the Microsoft qualifications.

At that time the situation regarding these courses and qualifications was rather novel in that:

- the Microsoft qualifying examinations were on line;
- the curriculum and examinations were created and controlled outside New Zealand, and hence outside local control;
- the people concerned with creating the curriculum and qualifications were not easy to contact;
- there was likely to be an inbuilt obsolescence factor as versions of the subject programs and the qualifications change over time;
- the courses and qualifications were not primarily designed to be delivered in schools.

The procedure followed was a standard process of course approval and accreditation. This recognised Microsoft’s ownership of the intellectual property rights to the courses and qualifications. ACE Training was recognised as the ‘owner’ of the qualifications from a course approval perspective.

Although the procedure was standard, it required referral back to ACE Training on two occasions, and was complicated by ACE simultaneously making application for approval of a higher level Microsoft course.

The mapping exercise identified similarities amounting to 25 credits under level 3 and 48 credits above level 3.

Course approval was completed on 14 March 2003. The official name of the qualification is Certificate in Microsoft Office Specialist – Master, and it was given Level 3 approval.

Once the courses had gained approval, in terms of level and total credits, they then had to go through a separate credit inclusion process. This required a separate submission from the ‘owner.’ Credit inclusion for NCEA was finally given in November 2003. 12 Credit equivalents were granted at Level 2, and 25 at Level 3.

During the latter part of the process, the New Zealand agent for the Microsoft courses, Computer Press Ltd, became involved. The process had been complicated by the involvement of three organizations, ACE, the Ministry of Education and Microsoft from the beginning. The addition of Computer Press added to the complication. The NZQA spokesperson did not think that the processes had been inherently problematical; but that it might have been smoother if either Microsoft or the course agent could have been dealt with directly. Legislation has now been changed to let bodies other than registered providers apply for course approval and accreditation. In part this was done to facilitate the process for other qualifications developed overseas, such as the International Computer Driving Licence.

Another factor which probably slowed down the process was the fact that NZQA as an organisation was focused on the changes involved in implementing NCEA. This was the major workload of the organisation.

The evaluator saw little evidence that registration and credit approval had a significant effect on the project schools' interest or enthusiasm for the MOS courses. However, during the course of 2003, several new, non pilot schools expressed interest in offering the courses.

## Summary

1. A registered provider was chosen to sponsor the process of registration and credit inclusion of the MOS courses.
2. The provider compared the MOS qualifications with qualifications which were already on the NZQA Register to establish comparability of levels.
3. Although the MOS qualifications presented a novel case to NZQA, being foreign owned commercial qualifications, the process of accreditation and approval followed a standard course.
4. The process was complicated and hence lengthened by involvement of several stakeholders in the process.
5. Legislation has now been changed to allow non providers to submit courses for registration.

### **How was the qualifications course regarded by other students in the schools, by parents and by prospective employers?**

At the end of 2002, students taking the MOS courses in each school were interviewed to find out their views on the qualifications. These were mainly Year 11 students.

The students' level of awareness of the courses and their opinions of them varied greatly from school to school. This seemed to reflect differences in the amount and effectiveness of the publicity which the courses received within the schools. Publicity for the courses in the Auckland schools seemed to have been less than in the Gisborne schools. Auckland students' responses varied from *'never heard of it'* to *'I got the information from looking at the wall.'* (In this school there was a poster about the MOS qualifications on the wall of the computer lab). By contrast, Year 11 students at most of the Gisborne schools appeared quite knowledgeable. Students received their information from teachers, the 2003 class options booklets and from talking to current MOS students. During interview, one student said that *'the courses are good to learn and give you skills even if you don't get the certificate.'* Another commented that *'The qualifications you can use through life. If you do them privately, they cost. The school pays for ours.'* Most of the students were aware of the potential career benefits of taking the courses, and most intended to study them in Year 12.

In late 2002, parents of Generation XP students were sent a survey form in which they were asked for their views on the Generation XP project. 36 Forms were returned by parents from all but one of the schools. Parents claimed varying degrees of knowledge about the MOS course. Some claimed not to have any knowledge of the courses, or that their child was studying them, whilst responses from others displayed a detailed knowledge. An example was that *'it is made up of 5 separate parts...it is extra to the normal school computer work'* and *'if my son is up to ...standard...he can then tutor other students.'* Generally, opinions of the courses from parents were very positive e.g. *'Excellent...a very*

*beneficial asset to have on one's c.v.* A couple of parents at one school had some misgivings about the mode of teaching and the fairness of the tests.

Two parents, whose children were in the same school and were taught by the same teacher, chose to send their completed forms directly to the evaluator rather than sending them *via* the school. The school was one which made study of the MOS courses compulsory for all Year 12 students. These parents' opinions of the courses were very negative. One commented that the courses were *'dreadful... shoved into schools... meaningless and time wasting'*, whilst the other complained that there was no personal teacher intervention to make learning memorable *'just one babysitter while the students run through a totally boring book'*.

Generally, parents who were most knowledgeable about the courses and who were most positive were those whose children attended the schools which were most successful in getting students to gain MOS qualifications. They were not parents of students attending schools where the MOS courses were compulsory.

The evaluator managed to locate four people or organisations which had employed MOS students during the course of the pilot. All four employers were located in the Gisborne area. The evaluator was unable to find any employer of MOS students in West Auckland.

Two of the employers were interviewed to determine their opinions of the MOS qualifications and the abilities of the students. These employers were the coordinator of community computer courses at the local polytechnic, and the manager of a boatbuilding company.

The polytechnic had employed about 12 MOS students over the two years of the pilot. These were drawn from three of the four Gisborne pilot schools, with the majority from school H, the most successful MOS school. Students had some MOS component qualifications, or had gained MOS Master status. The students were employed in running computer training courses for the local community. They worked primarily on a one to one basis as computer tutors, with occasional instruction in groups of up to ten people. Some of the students also acted to coordinate the work of other tutors. They most commonly taught community members how to use Microsoft *Word*. The next most popular program was *Internet Explorer*, not a MOS program.

The polytechnic spokesperson thought that the work the students did was *'absolutely excellent.'* Two of the students had *'incredible'* skills. Others, who may not have had such outstanding technical skills showed very good social and instructional skills. In general the students had a *'big breadth and depth of knowledge.'* The spokesperson would employ more MOS students *'without hesitation'* in the future. He thought the courses were *'well placed in the curriculum and a good thing to aim for'*.

The manager of the boatbuilding company was not so positive. He had employed one student during 2002 to do design work using a computer assisted design program. The manager was critical of the perceived *'lack of supervision'* by the school and was not willing to employ another student.

This student had not been employed to use any of the MOS programs, and the manager did not comment on the qualifications.

## Summary

1. Year 11 students at Gisborne schools were knowledgeable and positive about the courses. Many Year 11 students at Auckland schools had little awareness of the courses.
2. Student attitudes and knowledge appeared to reflect teacher enthusiasm and publicity about the courses within the schools.
3. Most parents of MOS students in schools where participation was voluntary were very positive about the courses. Very few parents were very negative about them.
4. A small number of parents expressed misgivings about the course pedagogy.
5. A limited amount of data was obtained on employers' attitudes to the MOS courses. The most reliable data, from a tertiary institution which had employed some MOS students part time, was overwhelmingly positive about the students' technical and on-the-job skills. The courses led to a *'big breadth and depth of knowledge.'*

## RESEARCH QUESTIONS RELATED TO THE ICT INFRASTRUCTURE

### **How technically reliable and robust, over time, were the ICT systems put in place by the business partners?**

During 2002, all schools experienced significant problems with the infrastructure. A universal problem affected the hard drives. Most hard drives had to be replaced during the course of the project. One school had a 75% hard drive failure rate within the first 18 months of the project.

Most schools reported good service from IBM in replacing hard drives, although one experienced difficulty over payment for hard drive replacement after the first year of the project. The original 10GB hard drives were replaced with 40GB drives. This size difference led to some problems subsequent to the replacement. An IBM spokesman said that the hard drive problem was *'embarrassing'* to IBM, but that the faulty drives were replaced under warranty. He saw the hardware as *'basic, robust and fundamentally reliable.'*

One of the coordinators also reported overheating of the IBM machines, and commented that he *'didn't trust the IBM machines.'*

Schools considered that ten computers, running as fat clients, were insufficient to run the MOS programme. Schools could not afford to run classes of only ten students. Schools thus worked to run the instructional software on other thin client machines, running the testing software on the original fat client machines.

Most of the other hardware – servers, data projectors and printers – ran well in the schools and was greatly appreciated.

Most schools experienced difficulties with the initial setup of the system, and operating the MOS software. Most schools considered that the time frame for setting up the systems was too short, and that there was not a proper partnership in place. It was considered impracticable within a school environment to isolate the ten best computers in the school in a separate pod dedicated to the MOS software alone. Most schools worked hard to integrate the machines with the rest of the school system. This led to problems arising from attempts to set up the machines with a dual boot facility to enable them to run Windows XP and the schools' operating system; and from to server incompatibilities. Two



Gisborne schools mentioned difficulty with having to absorb the Generation XP project and the KAWM computers at the same time. One of these schools was running three servers simultaneously, and ran into significant server incompatibilities. Another mentioned incompatibilities between *Watchdog* internet safety software and their server. Gisborne technicians reported having to rebuild one server five times before it would run successfully. This had seriously impacted on the MOS examination programme. Business partners reported delays in set up due to the variability of schools' computer systems. It was recommended that schools work towards a standard system, or, at least create inventories of their systems.

Some schools experienced problems with MOS testing software in the early stages, and during upgrades. Comments included mention of software crashes during students' qualifying examinations. This, and other software problems and delays led to some students going '*off the boil*.' It proved difficult to remotivate them.

Some schools expended considerable time and effort to set up computers for online delivery and testing of MCP material in 2002. There appeared to be some frustration at the on/off status of this part of the project, and coordinators would have preferred the technology to have been fully developed and tested from the start.

School coordinators and technicians reported that the project had taken up a considerable amount of technician time. Most schools struggled, and the technicians did not always find the helpline useful. Technicians would have appreciated more technical support from business partners especially during the initial phase of the project, and to cope with upgrades.

In many cases, schools felt that they had had the project '*dumped on*' them without consultation, and felt that many of these problems could have been sorted out with establishment of a genuine partnership and longer lead time.

During 2003, schools reported far fewer infrastructural problems. The main issue that arose, during 2003, apart from some residual hard drive problems was from difficulties involved with upgrades to the qualifying examinations. Two Gisborne schools were unable to run qualifying examinations for several months in 2003. This seriously impacted on students' motivation, and may reflect a need for more ongoing technical support. Alternatively, students could be tested at locations outside school. Some schools successfully used the Generation XP infrastructure to deliver other qualifications such as IC<sup>3</sup> and CISCO.

In the early stages of the project, set up of the MOS software was not carried out by Computer Press Ltd, the New Zealand agents for the qualification. The director of this company believed that some of the set up problems could have resulted from the efforts of organisations less familiar with the software. He has informed the evaluator that the process of setting up centres correctly to run the program is now a simple, routine procedure. Centres can be set up and running successfully within one day. Comprehensive documentation now exists to guide the process.

## Summary

1. All schools experienced difficulties with the IBM computers during the project. These were caused by a batch of faulty hard drives and by overheating.
2. There were software problems especially in the initial stages of the project. These difficulties were in part caused by schools needing to integrate the machines with school systems rather than running the Generation XP machines as a stand alone facility.

3. Setup was delayed by the variability of schools' computer systems. Working towards common school systems, or at least creating inventories of school systems was recommended.
4. There were also problems setting up the testing software, both in the initial stages and periodically as a result of upgrades to the testing software.
5. Infrastructural problems were much less of an issue in 2003.
6. The NZ agent for the MOS qualifications developed a trouble free procedure for getting new centres established to run MOS courses.

**How much, and for what purposes, were the infrastructural technologies provided by the business partners used by the schools for purposes other than the provision of Microsoft qualifications courses?**

The establishment of the Generation XP infrastructure in schools took longer than anticipated, partly because each school's computer system tended to evolve over the years. Thus there was not a standard configuration throughout all schools, and each school was an individual case. During interviews, business partners commented on this and recommended that schools work towards establishing common standards, or at least for each school to have an up to date inventory of their networks.

The influx of 10 networked state of the art computers, high bandwidth internet link, data projector and printer made a great difference to all the pilot schools. Originally, the pilot as conceived by the business partners envisaged the Generation XP computers as being isolated from each school's main network. This was intended to allow the pilot to proceed without interference from other computer-based activities. Only two schools kept to this plan. One used the Generation XP computers almost continually for MOS courses and also for other IT courses for senior students; the other kept the suite of machines in the school library, where it was used for Generation XP exams. In this school, teaching of the MOS courses took place in a separate ICT room. The computers in the library were used extensively as a whole school resource and for research, senior art and design, and by staff for report writing.

All schools regarded the Generation XP computers and infrastructure as a valuable resource. On interview, many principals said that schools could not afford to have '*the best computers in the school*' underused, and regarded the idea of isolating the Generation XP computers from the rest of the school system as unrealistic. Hence schools worked to integrate the Generation XP machines with the rest of the school network. This contributed to the infrastructural problems on set up.

All schools reported that the computers were in constant use throughout the school day and beyond. Some schools used the machines almost exclusively for IT classes, timetabling them for up to five periods each day. In other schools, the computers were used by a range of classes for activities including web based research, website design, e-mail, word processing, spread sheeting and preparing *Power Point* presentations. In most schools the computers were used by a wide age range of students. One school set up an internet café which was open before and after school, and during lunch times. Other schools ran community computer courses which used the Generation XP machines.

Availability of the computers and high-speed access made a '*huge difference*' to the schools. Most schools reported a marked lifting of awareness of the potential of ICT in teaching and learning, and several mentioned that Generation XP resulted in more allocation of funding to ICT resources.

## Summary

1. Most schools worked to integrate the MOS computers into the wider school network in order to make fullest use of them.
2. The computers in all schools were in almost constant use throughout the school day. Apart from the MOS courses, they were used for a wide variety of applications including other ICT courses, web based research, art and design, *Power Point* presentations, word processing reports and spread sheeting for mathematics and science. Teachers at one school used them for report writing.
3. Some schools made the computers available outside classroom hours, one running an internet café for students. Other schools made the resources available to the wider community.

### **In what ways did any relevant content resources or communications tools provided through TKI contribute to the organisation and the teaching of the Microsoft qualifications courses?**

During the start up phase of the project, the website set up by LCT to serve the Generation XP project was used to pass on operational information from Microsoft Ltd, the lead business partner, to the participating schools. In addition, in the first year of operation, all schools posted one or two bulletins describing their progress with the project. The last of these were posted in May 2002.

The coordinator from School H posted two items on the Generation XP teachers' forum in the early months of the project, and one of his students displayed an impressive *Power Point* presentation on computer safety and ethics.

The Generation XP project focused on training students for pre existing commercial IT qualifications. Hence it was thought that there was little need for curriculum or resource development. The Digital Opportunities staff at LCT were consequently encouraged to put most of their efforts into providing facilities and services for the other projects, which needed a greater level of support than Generation XP. There were no content resources provided through TKI, and the last contribution to the web site was a list of general web links updated in January 2003.

## Summary

1. The Generation XP website was used in the early stages of the project to pass on information from the lead business partner to schools and to post periodic reports from schools.
2. After the set up, the web site was not used as a communication tool or resource for the project.

## **RESEARCH QUESTIONS ABOUT THE IMPACT ON TEACHERS AND TEACHING**

### **To what extent, and with what effects, were the schools able to integrate or separate their teaching of the Microsoft Qualifications with the teaching of other specialist ICT courses for other qualifications?**

Three of the eight schools, all of them single sex, taught the courses as stand alone courses. Two of these schools made the MOS courses compulsory for all year 12 students, one of them having 80 hours compulsory ICT classes per year at all levels. These two schools had among the lowest student pass rate from the MOS qualifying examinations. They also had the most critical feedback from students at interview and from the parent survey. This was despite the coordinator from one of these schools thinking that with the amount of ICT exposure the students had, they were expected to succeed well in

the MOS examinations. Both schools offered other ICT courses – e.g. the International Computer Driving Licence (ICDL), or Unit Standards. Both schools were considering changing their focus during 2004, partly as a result of the courses being registered on the NZQA Register and having credit inclusion towards NCEA. One school was considering focusing on running Unit Standards for the majority of students, and MOS for the more academically able. The coordinator planned to offer the Internet and Computing Core Certification (IC<sup>3</sup>) course to junior classes as a lead in to MOS. The other school was planning to use MOS NZQA credits as part of the requirements for the National Certificate in Computing (NCC).

The other single sex school which taught the MOS courses in a stand alone mode ran the course with year 12 and year 13 option classes in 2002, and at year 13 in 2003. He found that the courses '*hang together*' well, but were more suited to the more academic students.

The other schools in the pilot integrated the MOS courses with pre-existing courses covering Text and Information Management (TIM) or similar subjects leading to Unit or Achievement Standards, or Sixth Form Certificate (in 2002). Several schools were unhappy with the *Step by Step* course books issued to the pilot schools, and generated their own material (see below).

In the case of one school, teachers were prevented from teaching MOS as stand alone courses by Board policy that the only courses taught in the senior school were to be those leading towards NZQA recognised qualifications. This coordinator saw the delays in registration and credit inclusion as a significant barrier to the MOS courses' growth in the school. She said that it was '*a squeeze*' to '*crunch both courses together*' for all but the best students. The students had to be self motivating and rely on independent learning because there was '*simply not time*' to teach the MOS material properly. Another pressure on the school was the perceived obligation to '*use up*' the school's allocation of MOS examination vouchers.

Another school's coordinator reported that it should be easier to encourage students to study for MOS qualifications '*now that they are on the framework.*' She also reported that the school had found integration of MOS courses with NCEA material to be more difficult than integration with Sixth Form Certificate, because of the NCEA '*system*'. More academically able students were attracted to achievement standards with their '*credit-merit-excellence*' gradings, rather than MOS with a simple pass-fail outcome.

MOS courses integrated well with *Word* processing courses in a West Auckland mixed school. The coordinator saw a '*strong overlap*' with skills students had already learned studying for the ICDL. MOS work was essentially seen as revision for Year 13 students with previous ICT experience. However, he thought they could be difficult for students with no prior learning.

A Gisborne school '*fully integrated*' the MOS material with unit standards courses in 2003. The MOS material was considered as an extension for more able students. The coordinator thought the material was not suitable to be used with the whole of her year 12 classes. It would have to be taught as a class to the less motivated or less able students. Time constraints would make this difficult. The coordinator saw the unit standards courses as being '*watered down*'. MOS provided a good challenge to able students.

In the remaining Gisborne school, MOS was fully integrated with Sixth Form Certificate and an information technology special project. The MOS courses were found not to fit in easily with other courses. Teachers at this school also had considerable ethical and philosophical issues with the pedagogical model for these courses, which is based on a commercial instructional training approach developed for the American workplace. Despite this, the school had the highest rate of achievement of

all the participants in the project, having successfully trained eight MOS masters by the beginning of 2003. The school was a world leader in its students' MOS results, and one student was flown to Florida by Microsoft for a MOS student convention.

Several coordinators and teachers commented on the contrast between the style of the MOS courses and tests and the New Zealand qualifications. The MOS courses concentrate on individual, particular skills. To pass students have to master a fixed way of approaching a task. By contrast, unit standards qualifications are much more focused on the students' being able to produce a finished product. There is far less emphasis on the minutiae of achieving the result. To use a constructional analogy, the MOS courses teach students to make perfect bricks, whilst unit standards teach them to produce a well designed house.

Teachers commented on problems with the practice test material. They saw the material supplied on the practice CD as limited in scope. Students found that they could learn the answers to the questions parrot fashion and get a good score with these tests. However, this did not mean that they understood the material. Often students who had done this failed the qualifying tests. Another problem was that the practice tests were different in structure and layout from the qualifying examinations. Both were alien to many students' prior experience. The qualifying examinations were seen as being more difficult than the practice tests, and one coordinator claimed inconsistencies of marking and content in the examinations. Some schools approached this issue by downloading free MOS test material from the internet.

Most of the schools did not teach the whole suite of MOS courses. All schools taught *Word* and *Excel*, but only a couple taught *Outlook*. Thus only some of the MOS students had the opportunity to study for the complete range of MOS qualifications.

## Summary

1. Three of the eight pilot schools, all single sex, taught the MOS material in stand alone courses. Two of these schools made the courses compulsory, and had among the lowest pass rates of the pilot schools.
2. The remaining schools integrated MOS teaching with that of other ICT based courses.
3. Most of these schools did not find it straightforward to integrate MOS with other courses. MOS was often seen as useful extension material for more able students.
4. Teachers commented on the difference in pedagogy and requirements between the MOS qualifications and the common New Zealand qualifications.

### **How effective did the qualifications course tutors find the training and professional development offered by the business partners?**

All schools sent teachers to the initial professional development run by Auldhouse Ltd. Up to nine staff attended from each school. The training was offered in two blocks.

One coordinator regarded the training as '*very good*'. However most of the participants were more negative. One coordinator commented that the courses were '*poorly presented, irrelevant and perfunctory.*' Teachers thought that the courses were unfocused, and that the trainers had no clear course objectives, and were unsure of the purpose of the training. The courses appeared to focus on how to use the training material, rather than on how to teach it. The second session was regarded as more valuable, and was directed towards the MOS tests. One teacher thought that it passed on valuable

tips. Another found the opportunity to interact with other MOS teachers especially valuable, although a comment was made by one teacher that she could not see the relevance of teachers from other subject areas attending the course.

Teachers who attended the *Navcon* conference in Melbourne generally found the experience valuable.

Teachers' comments about the training were discussed with the spokesperson for Microsoft Ltd. He stated that the training involved teachers with a wide range of prior experience, and hence it had to cater for the lowest common denominator. He claimed that research had been carried out prior to the training to determine capabilities, and that the trainers were aware of the capabilities of the teachers. He also thought that the fact that the trainers were working away from their usual environment made the task more challenging.

Several teachers commented that there needed to be ongoing professional development, especially to compensate for staff turnover in schools. One school which had eight teachers attend the initial training courses had only one of these teachers teaching MOS courses in 2003. This school and one other used staff who had received minimal or no ICT training to run the courses.

Most teachers interviewed felt that they had not received adequate professional development to run the courses. One mentioned that industrial action had interfered with the professional development programme. Another found that sorting out technical problems used up all her professional development time. All regretted the non availability of professional development in 2003.

A couple of teachers commented favourably on the professional development which they had received from Computer Press during the representative's visits, and also on the help afforded by the project manager.

## Summary

1. Teachers had mixed feelings about the training offered at the start of the project. Most were not satisfied with the training, regarding it as inappropriate and poorly planned.
2. Teachers appreciated the opportunity to attend the *Navcon* ICT conference in Melbourne.
3. Ongoing professional development was considered necessary, especially to cope with staff attrition from the MOS courses.
4. Professional development provided by Computer Press during visits to schools was seen as very helpful.

### **How satisfied were the qualifications course tutors with the courses as they have taught them?**

There was a range of responses to this question from teachers in the various schools. Several regretted that lack of time meant that they felt unprepared for the courses, and had not been able to prepare supplementary material.

Teachers from the two schools that made the courses compulsory seemed to be least satisfied. In one of these schools, some teachers were running the courses as a 'fill in' and were not committed to them. Consequently the courses tended to drag. In 2002, the coordinator from this school reported dissatisfaction with the *Step by Step* approach, and evolved a lesson by lesson style. In 2003, he reported success in linking the MOS material to thematic work, such as designing a high performance vehicle. A teacher at the other school felt '*frustrated*' by the courses. She thought the courses were easy to teach because the students '*worked through the book,*' even though students were bored and

behaved badly. In 2003, the coordinator said that he was *'frustrated by the courses and the attitudes of compelled students.'*

Teachers at other schools were more positive. Several schools reported experimenting with the way they taught the courses. Most coordinators were not completely satisfied with the pedagogical approach of the course. There were remarks about the unsuitability of the course content for New Zealand schools, and several adverse comments about the course books. One coordinator said that working with the books was slow, boring and not a good learning experience. She added that *'able kids can do it quickly. Others are not involved and take a long time.'* Some teachers felt thrown in at the deep end, and would have appreciated some professional development before starting to teach the courses. A teacher in another school said that there was *'too much independent learning.'* She regretted the lack of opportunity to teach all the students together.

The coordinator of the school which had greatest student success had mixed feelings. He would have preferred to have had a preparatory course before students studied MOS material. This school introduced the IC<sup>3</sup> course for year 11 students in 2003. This teacher had serious reservations about the educational philosophy underpinning the MOS courses, and commented that *'the power dynamic of this positivist approach (is the) antithesis of what I believe teaching is about –but I'm not above using this for the benefit of my kids.'* He regretted that sufficient time was not available to prepare alternative teaching materials. He reported great satisfaction from the students who were achieving well, mixed with disappointment with the others.

Two schools prepared some supplementary material for the courses. They regarded the reading age of the material as being too high for most of the students. (This issue is covered below). Most schools reported that students with English as a second language experienced difficulty with the courses and with the examinations, where they were under time pressure.

One West Auckland single sex school coordinator was satisfied with how he had taught the courses. He saw no difficulty with the course books, but regarded the drill approach to the material as *'heavy handed.'* His approach was to arrange the students to work in groups of three. He thought this was satisfactory. The cooperative approach took the pressure off individual students.

## Summary

1. Teachers in schools that made the courses compulsory were least satisfied.
2. Most coordinators reported dissatisfaction with the pedagogical approach of the courses and with the course books. Some prepared supplementary resources which they thought more suitable, and others experimented to make the courses more appealing.
3. Teachers frequently commented about lack of time to prepare for the courses.

### **To what extent did the teaching staff in the pilot schools, other than those who teach the qualifications themselves, use the Microsoft Qualifications training as a means of upskilling themselves as users of ICT?**

In 2002, there was a variable uptake of professional development opportunities through the Generation XP programme. Schools sent up to 10 staff on the initial Generation XP professional development courses. Many of these teachers were not ICT subject teachers, and others did not teach MOS courses for long. Coordinators regarded this training as being a valuable help in getting ICT established as part of schools' culture.

A few teachers at Generation XP schools took advantage of the opportunities offered by the programme to improve ICT skills. About four teachers across the project gained passes in one or more of the MOS examinations. Problems with disruption due to industrial action, and pressure of work due in part to the introduction of NCEA, limited teacher upskilling through the project.

The amount of use of the courses by teachers in 2003 was even less. Several schools reported that there had been no use of MOS courses by teachers in 2003. The Gisborne lead school reported that *'we had a lot of teachers try when there were free vouchers for the Certiport competition. This made the teachers aware of what they did not know.'* Two or three teachers continued. One of the Gisborne single sex schools planned to make ICT professional development the focus of a *'big push'* in 2004, using both MOS and IC<sup>3</sup>.

## Summary

1. Schools sent staff, including non-Generation XP staff on the initial training course. This had the effect of raising the ICT profile within schools.
2. A few teachers gained MOS examination passes, and others studied the courses in 2002. This professional development was constrained by time pressures.
3. In 2003, little use was made of MOS courses for professional development in the schools.
4. One school planned to incorporate MOS and IC<sup>3</sup> in staff training in 2004.

### **Supplementary Research Question. In view of concerns expressed by MOS teachers concerning readability of the MOS *'Step by Step'* course books, how does the readability of these resources compare with other MOS texts and with New Zealand produced ICT resources?**

The readability of *Step by Step* resources supplied for the programme was compared with those of other commercially available MOS approved text books, and with ICT resources commonly used by New Zealand schools. The readability of some supplementary resources produced by MOS schools was also evaluated. The readabilities were estimated using the method developed by Edward Fry, as described by Kathy Schrock (1995). Table 6 gives the results. Several of the resources included longer passages of text interspersed with instructional sequences. The reading ages were calculated for the text passages. The instructional sequences were difficult to evaluate because of unusual sentence lengths and numbers of syllables.

The results indicate that the apparent reading ages of the Microsoft texts were consistent with the chronological ages of the Generation XP students. Nevertheless, teachers reported that students had difficulty understanding the material. The estimation of reading ages was based on the numbers of syllables and numbers of sentences per 100 words. The difficulties students experienced in reading the course materials despite the fact that their estimated reading ages were similar to students' chronological ages may be due to the use of unfamiliar technical terms or sentences whose meaning was unclear.

Nevertheless, it is clear from these evaluations that the Microsoft *Step by Step* texts supplied for use in the pilot schools had reading ages up to four years higher than common New Zealand text resources produced for ICT classes. The *Step by Step* resources also had a much higher reading age than a resource produced by one Generation XP school. The *Step by Step* texts also seemed to have higher reading ages than other commercially produced texts approved for MOS certification.



Readability relies on visual layout and attractiveness of the pages of the resources. The notes in the table indicate that the layout and appearance of the various resources varied considerably. Students commented at interview that the *Step by Step* resources were 'boring' and difficult to read, although others commented that they were 'fine.'

Comments about the resources were discussed with Computer Press. This company arranged for New Zealand resources for the MOS courses to be produced by the author of *Learning Word 2002* which was included in the present survey, and of many other ICT resources used in New Zealand schools.

### Summary

1. The *Step by Step* resources provided to support the programme were found to have reading ages up to four years higher than those of texts commonly used in New Zealand schools.
2. A new resource is being produced locally to support teaching of MOS courses in New Zealand schools.

**Table 6. Fry Readability of MOS and other training materials**

<b>Name of Resource</b>	<b>Target Audience</b>	<b>Reading Age</b>	<b>Notes</b>
Microsoft <i>Word 2000 Step by Step Courseware Core Skills Student Guide</i>	MOS Text	14 Years	Official MOS Text Supplied. Colour presentation. Screen Dumps. Some large chunks of text. Smallish font.
Microsoft <i>Excel 2000 Step by Step Courseware Core Skills Study Guide</i>	MOS Text	15-16 Years	Official MOS Text Supplied. Colour presentation. Screen Dumps. Some large chunks of text. Smallish font.
Microsoft <i>Excel 2000 Step by Step Courseware Expert Skills Study Guide</i>	MOS Text	16 Years	Official MOS Text Supplied. Colour presentation. Screen Dumps. Some large chunks of text. Smallish font.
Viva!	Year 11	11-12 Years	Lots of space. Simple layout. Clipart.
Tempo!	Year 9-10	11 Years	Lots of space. Short sentences. Varied font. Clipart.
Finale!	Year 12	12 Years	Lots of Space. Short Sentences.
Learning Word 2000	Level 2	12 Years	Lots of space. Screen dumps. Short Sentences.
Waitakere College Home Produced Resources	MOS	10-11 Years	Simple Language. Reasonable amount of space. No Clipart. Glossary.
Microsoft Excel 2000	MOS Text	12-13 Years	Approved MOS Text. Colour presentation. Screen Dumps. Some large chunks of text. Smallish font.
Microsoft Word 2000	MOS text	13-14 Years	Approved MOS Text. Clear Layout. Many full colour diagrams. Screen Dumps; Large fonts.
Preparing for MOS Certification	MOS Text	12-13 Years	Approved MOS Text; Black and White; Some pages dense. Screen dumps. Unusual, non serif font.

(These resources are referenced at the end of the report)

## RESEARCH QUESTIONS RELATED TO THE SUSTAINABILITY OF THE PROJECT

### **To what extent, and under what conditions, did the stakeholders regard the project as sustainable in the pilot schools beyond the pilot phase?**

During 2002, schools were concerned about the prospect of the computer hardware being removed from their premises at the end of the pilot. They also had other financial concerns. Most schools had found the project expensive in terms of technician hours required to get the systems running satisfactorily and to cope with computer failures and software upgrades. They foresaw this type of problem becoming an expensive ongoing cost in the future. Other concerns related to possible costs to schools of being accredited providers of the qualifications; and future costs of upgrading teaching resources and testing software for subsequent versions of the qualification. Costs needed to be kept in line with what schools could afford, or schools would need ongoing finance to support sustainability into the future.

Another cost issue which was raised by schools was the cost to students of sitting the examinations in the future. Several schools stated that costs of over \$120 per examination would be prohibitive. One West Auckland coordinator reported that her school had difficulty in raising examination fees from parents in the past. A fee of \$35 had been an obstacle to students taking Pitman's examinations.

Several school coordinators had originally not expressed strong views regarding credit inclusion of the qualifications. As time went on, however, most schools were of the opinion that lack of credit inclusion was a major barrier to student enrolment and hence to sustainability in the future. At least one school had a policy of not teaching courses that did not lead to NQF qualifications. Lack of credit inclusion in 2002, and the delay of inclusion to late in 2003 meant that MOS could not be run as a stand alone course in subsequent years.

During interview with the evaluator, several schools had mentioned problems with staff turnover, and the need to provide professional development for new and for continuing MOS teachers.

During 2003, several of these problems were addressed by the Ministry of Education. The Ministry agreed *inter alia* to:

- Continue paying the lease on hardware, and then gift the equipment to schools
- Provide ongoing specialist training for staff
- Provide subsidised examination costs for students, bringing the cost per examination to \$35
- Fund the Generation XP coordinator to liaise with staff and schools until December 2004.

These provisions did not address schools' broadband and technician costs, which they would have to meet from other resources.

At the end of 2003, coordinators were generally positive about the future sustainability of the project in their schools. A couple of schools continued to have concerns about the cost of the examinations to students, and wondered how students would respond. Others expressed ongoing concerns about costs to the schools. A West Auckland coordinator raised the problem of upgrades to the MOS qualifications, saying '*if the programme runs far ahead of what the school can fund, there will be an issue of the expense of keeping up with cutting edge technology. If the government wants schools to continue to run with it, there needs to be continuous financial support to cover hardware and broadband requirements.*' Another coordinator regarded the formal recognition of students' learning

through credit inclusion as an important step, but said that the qualifications need to be *'future proofed.'*

One of the effects of the Generation XP project has been to initiate a shift in schools' culture towards embracing ICT in teaching and learning. Several coordinators and principals saw this as the beginning of a process which could take up to ten years to work through.

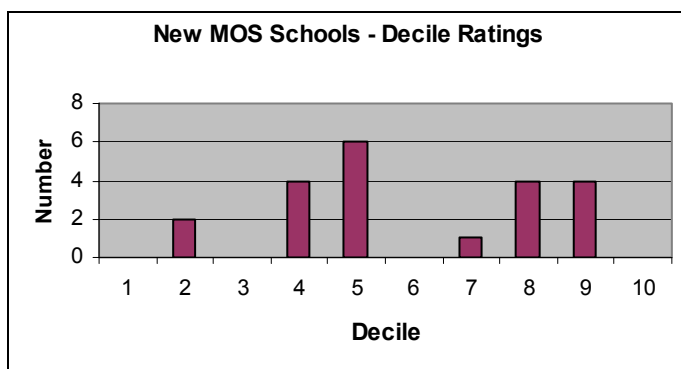
During 2003, the Ministry commenced funding a Generation XP coordinator to liaise with participating schools and staff. This person was the coordinator for one of the Gisborne schools. He regarded the project as being sustainable, especially if extended to include other qualifications. Several schools began to develop a suite of courses on the foundation of the MOS experience. Schools offered, or planned to offer IC<sup>3</sup>, a lower level suite of computing qualifications administered by Certiport, CISCO computer networking qualifications and WOW webmaster courses. By the end of 2003, over twenty students studied for the IC<sup>3</sup> qualifications in two schools, and achieved twelve passes.

During 2003, 12 schools were involved in CISCO training, including three Gisborne Generation XP and two FarNet Digital Opportunities schools. The Generation XP coordinator expects this number to rise to around 24 schools in 2004. In 2003, approximately 60 students studied CISCO courses, gaining over 45 semester passes. The teachers were able to teach the courses in a very flexible way, and tailored their approach to suit their students. The coordinator saw this flexibility as being important in helping students to succeed, and in raising their self esteem.

The manager from Microsoft Ltd who was responsible for the Generation XP project believed that the project had exceeded Microsoft's goals. He was impressed with the calibre of some of the MOS graduates, and saw the longer term goal as being to make the opportunity available to more schools. In order for the project to be sustainable into the future, he saw the need for ongoing support not only from schools, but also from government, in terms of wanting to continue partnerships with industry.

Computer Press, which was the agent for the qualifications and training resources within New Zealand, also saw the project as sustainable and capable of roll out in the future. This company developed a well founded procedure for establishing new schools to run MOS courses, and produced initial training for school staff. By the end of 2003, ten new schools were confirmed or had set up as MOS centres, and a further ten were in progress (Duncan 2003). These new schools showed a shift of involvement in MOS training towards higher decile institutions, nine being of decile 7 or above, and only six below decile 4 (Figure 22). None of the Generation XP schools had a decile rating above 5. The new schools were not funded from the Generation XP programme.

**Figure 20. Decile Ratings of New MOS Schools**



### ***Some Comments Regarding the MCP experiment (Phase Two)***

In 2002, Microsoft planned to run training for their Microsoft Computer Professional qualification by online video streaming to participant schools. In the event difficulties with the video streaming technology led to the mode of delivery of this course being face to face. There had been long delays in this 'Phase Two' of the Generation XP programme, and students and staff in some schools became disillusioned. Notwithstanding this, some students received face to face MCP training at the end of 2002, and took the qualifying examinations early in 2003. Phase Two was not continued as a major part of the Generation XP pilot in 2003, although the Gisborne lead school negotiated to continue MCP training. Microsoft Ltd regarded the MCP exercise as an important learning experience, and the Ministry's Digital Opportunities manager commented that some of the technology supporting Microsoft *Class Server*, an online learning portal, evolved from experience with the MCP project.

### **Summary**

1. Schools and businesses regarded the programme as being sustainable in the future.
2. The fact that the courses had achieved NZQA approval and NCEA credit inclusion was regarded as important.
3. Many of schools' concerns were addressed with the Ministry's Memorandum of Understanding regarding continued support in 2004.
4. Schools continued to voice concerns regarding ongoing costs of maintenance, upgrading and being an accredited centre.
5. Examination costs even at subsidized rates may be a barrier to students.
6. At the end of 2003, the MOS training was being extended to a further 20 schools.

### **What lessons were learned from the pilot which could usefully inform any roll out of the scheme out to other schools and other school districts?**

During the course of the pilot, the evaluator was struck with the richness and complexity of the evolving project. There was a wealth of stakeholders, each with a different view of the situation, many complex tasks to be carried out and issues to be worked through. Some lessons arose during the course of interviewing and discussing the project with participants. In addition, in order to account for all the factors, the evaluator decided to use Soft Systems Methodology to highlight problematical areas and their implications for future roll out and sustainability of the scheme. Soft Systems Methodology is described in Appendix 1 and its application to the present project in Appendix 2.

Key facets of the situation which were considered as candidates for improvement during the systems analysis concerned teaching and student learning, the nature of partnerships between businesses and schools, and the training and professional development of MOS teachers. Soft systems methodology (SSM) uses modelling of idealised systems designed to overcome problems in the real world situation to produce 'desirable' suggestions for change. These are meant to be bases for dialogue leading to agreed actions for improvement. Suggestions which were highlighted by the SSM treatment are distinguished in the following list by a star.

1. In future roll outs and similar projects, identification of committed schools and their full involvement in the partnership is more likely to guarantee project success.
2. It will be helpful to establish realistic and meaningful performance criteria for schools to work to, and encourage schools to establish effective monitoring and control systems.

3. Teacher selection, initial and ongoing training was seen as crucial to the success of the programme. Teachers need encouragement to reflect on their performance. Using unqualified teachers in MOS classes was not successful and should be discouraged.
4. If the aim is to be to improve the qualifications of Maori and Pacific students, the environment and courses would need tailoring to their needs. This could include greater teacher encouragement, modified course materials and teaching approaches.
5. Courses and presentation would need to be adjusted to be attractive to Maori and Pacific students. This could be difficult given the nature of the content and assessment regime.
6. In order to increase the numbers of Maori and Pacific students taking the courses, it is suggested that target levels be set.
7. Local iwi and Pacific community leaders should be involved in planning roll outs of the project.
8. Publicising the courses among the target communities was seen as vital.
9. The project could be located in marae and other community centres as well as in schools.
10. The need was highlighted to create teaching resources relevant to New Zealand school students.
11. Schools were provided with too few course books for the numbers of students taking the courses. In future roll outs, it would be important to provide sufficient teaching resources for numbers of students enrolled.
12. Students would be helped by sourcing or producing relevant formative assessment materials with the same format and level as the qualifying examinations.
13. Upgrading the programme to accommodate new versions of the course content and testing software would involve extra costs unique to the programme. Schools would need funding for sufficient technical support to ensure that their computer systems are adapted quickly to cope with these changes.
14. ★ Staff training and professional development would need to be carefully targeted to the staff who teach MOS courses.
15. ★ New MOS teachers would need training, and ongoing professional development of MOS teachers would be needed to enable them to cope with upgrades to the curriculum and technology.
16. Initial training was seen as desirable to help new schools to set up MOS training courses.
17. Most schools did not perceive the project as being a true ongoing partnership between schools, businesses and the Ministry. They felt ‘dumped on.’
18. True partnerships would involve ongoing cooperation and communication for the duration of the project.
19. Schools and students would benefit from a greater awareness of the business world and its opportunities. Businesses could get greater exposure and recognition of the social good of their involvement.

20. Communication could be fostered by periodic newsletters reporting progress with the project, and by business representatives visiting schools once or twice a year.
21. The Digital Opportunities Manager or the Generation XP Project Coordinator could facilitate communication.





## Appendix 1 Soft Systems Methodology

Soft Systems Methodology (SSM) was originally conceived as a seven stage process of researching complex real life situations. It was originally proposed by Checkland (1984) and has been further developed by Checkland and others over the ensuing thirty years (e.g. Davies and Ledington, 1991). SSM has been applied to a wide range of situations by researchers in many western countries, including New Zealand. These situations have involved industry, health providers, civil service, overseas development organisations and educational institutions (See e.g. Checkland and Scholes, 1999).

Soft Systems Methodology 'is a means of guiding the tackling of real world situations which are perceived as problematical for some of the time by at least one member of that situation.' (Davies and Ledington, op. cit. p11). It was thus considered to be of potential value in the present study.

Soft Systems Methodology is structured to allow for data collection and analysis of the real world situation, creation of idealised models of the situation, and suggestion of possible solutions to improve the situation. The seven stages are shown in Table 7 (adapted from notes posted on the web by Travis and Venable (1999)) and in Figure 21. Stages 1,2,5,6 and 7 take place in the 'real world' whilst steps 3 and 4 are part of 'systems thinking'. Note that in this approach, the term 'system' refers to the conceptual world of 'systems thinking'. It is not applied to the 'real world' situation. In the present evaluation, the logical analysis is followed through to step 5. Steps 6 and 7 are intended to be discussed with participants in the situation in order to bring about improvements. The cycle can then be repeated in order to continue an ongoing process of improvements. Steps 6 and 7 of the methodology were not carried out in the present project, because of the way in which the evaluation process was set up. The evaluator considers that the project could have benefited by following the full SSM process after a year of operation.

The seven stage process is not a rigid formula to be slavishly followed when working with real world situations. It is often more appropriate to loop back and revisit earlier stages as the process unfolds. Dick (2002) has described the methodology from a dialectical perspective.

The seven stage process is not a rigid formula to be slavishly followed when working with real world situations. It is often more appropriate to loop back and revisit earlier stages as the process unfolds. Dick (2002) has described the methodology from a dialectical perspective.

Situations in the real world are '*soft*' – i.e. they involve people and organizations and hence are embedded in a cultural context. An important aspect of the '*developed form*' of SSM is a cultural analysis which explores the roles, norms, values and power structures within the situation. This '*cultural analysis*' is an essential complement to the '*logical analysis*' of the seven stage model.

### *Logical Analysis*

The first stage in the logical stream of analysis is the gathering of data. In this study, such data included '*hard*' data (such as numbers of students, ethnicities, gender distributions etc) and '*soft*' data which gave valuable insights into the cultural milieu of the project. Such soft data included data gathered by interview and from qualitative answers to survey questions. It also included subjective impressions gathered from on site visits and phone discussions with stakeholders. The aim was to assemble as rich a range of relevant data as possible.

In the second stage, this data was assembled into the form of a '*Rich Picture*'. The aim of the rich picture is to capture the richness of the situation by illustrating the issues, tasks and climate of the situation. Both '*hard*' and '*soft*' data were used to generate the rich picture.

**Table 7. The Seven Stages of Soft Systems Methodology (After Checkland 1984)**

<b>Stage</b>	<b>Main activity</b>
The unstructured problem situation	Gathering quantities of background information
The problem situation expressed	The situation is expressed in the form of a <i>'rich picture'</i> to illustrate structures and issues needed for subsequent analysis, reflection and developing systems for change.
Creation of <i>'root definitions'</i> of relevant systems	Developing statements, from various significant viewpoints, defining the systems, the people involved in, or who could affect the system, the transformation carried out by the system, the system's environment and the system's purpose.
Creation of <i>'conceptual models'</i> of relevant ideal systems	Creating models, based on the root definitions which represent desired human activities. The modelling process involves the minimum necessary activities to carry out the transformation process required. It involves consideration of the time sequence in which the activities must be carried out.
Comparing the conceptual models with the problem situation	The aim here is to understand the problem better, and to identify differences between the model and the actual situation, so as to suggest potential improvements.
Identify desirable and feasible changes	The changes suggested in step 5 are discussed to determine which of them are able to be accepted and integrated into the cultural setting of the situation. Economic considerations may also be relevant.
Taking action to improve the situation	During this stage, discussion takes place and plans are drawn up covering the action to be taken, the people involved and the timing of appropriate actions. Actions should be aimed at improvement of the situation, rather than for the sake of change.

The rich picture was used to help identify areas to focus on during the analysis. Such areas included key tasks and problematic features of the project. These were areas which it was believed could be 'improved' in future roll out and development of the project, and were candidates for modelling using systems concepts. The systems which could be derived from these areas were classified into *Task Based* and *Issue Based* systems. A key aspect of systems thinking is that of *hierarchy*. Systems relating to large tasks or issues are made up of interacting lower level systems. Thus an educational task system would include teaching/learning systems, resource gathering systems, assessment systems etc.

The next stage in the logical stream involves moving from the real world to systems thinking, and developing models of systems representing improvements on aspects of the real world situation. This was done by creating root definitions and conceptual models of relevant task based and issue based systems.

A root definition of a relevant system is a concise description of what the system *is* – i.e. *a system to do X by means of Y in order to achieve Z*. The formulation of a root definition is based on a set of criteria which is known by the acronym CATWOE. The components of CATWOE are shown in Table 8.

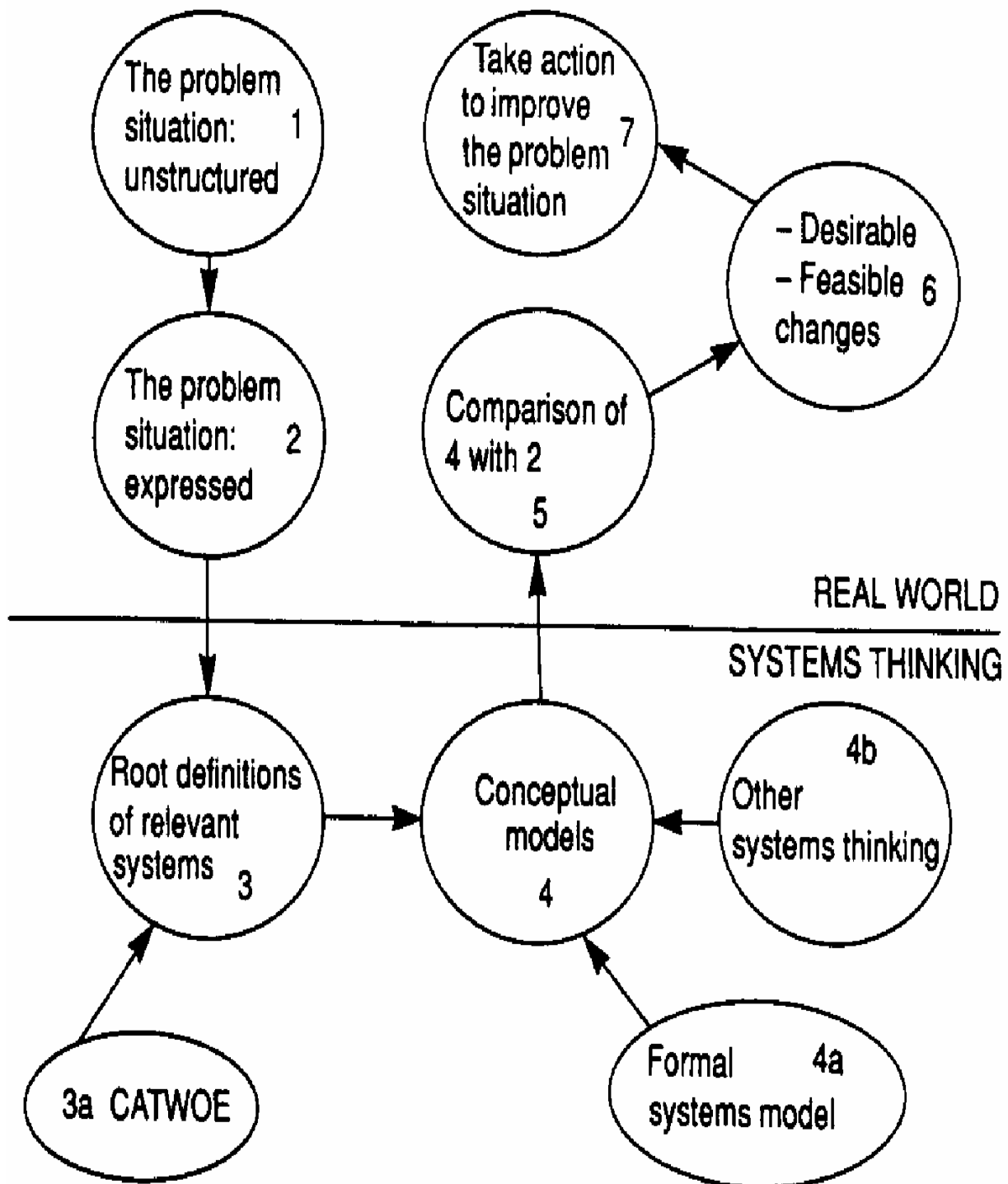
The root definitions of the relevant task based and issue based systems were next used to create conceptual models of the systems. The conceptual model involves considering the minimum necessary number of activities needed to carry out the system's transformation process. It involves considering the time sequence in which the activities must be carried out to achieve the transformation process. In order to develop conceptual models, the activities implied by the root definitions were listed in their chronological order by creating lists of *logical dependencies*. The conceptual model shows the activities necessary for the transformation, arranged in time sequence, and connected by arrows to show the movement of relevant items (people, information, energy, materials etc

In order for systems to survive over time and to respond to changes in the environment, there needs to be effective monitoring and control subsystems which monitor all the processes within the system, compare performance with appropriate criteria, and regulate systemic activity to maintain or improve performance.

Having completed root definitions and conceptual models, the analysis moves back into the real world with the comparison of the conceptual models with the real situation. This was done for each selected system by listing the activities in the conceptual model, determining whether each activity existed in the real world situation and considering how each activity was done in the real world, and how it was judged. This process gave rise to ideas for improvement based on the disparities between the models and the real world. These ideas in turn led to suggestions for *desirable* changes which could be made to improve the situation and to guide future progress.

The parallel cultural analysis was broken into three sub analyses. Following Checkland and Scholes (1999), Analysis One considered the roles of client who commissioned the evaluation, problem owner and problem solver in the situation. Analysis Two was concerned with the roles, behavioural norms of key players in the situation; and the values against which performance of the roles were judged. The third analysis was concerned with the power dynamics of the project.

Figure 21. Diagrammatic Representation of the Seven Stage Soft Systems Model



From Travis and Venable, 1999

**Table 8. CATWOE**

<b>C</b> ustomers	Who are the beneficiaries or victims of the proposed action?
<b>A</b> ctors	Who will carry out the activities
<b>T</b> ransformation	What is the proposed action? What transformation (of material or abstract entities) is to be carried out? This can be expressed as: Input → <b>T</b> ransformation → Output
<b>W</b> orld view or <i>Weltanschauung</i>	What is the world view which makes the root definition meaningful?
<b>O</b> wner	Who could stop this activity; or could make or break the system?

Considering the desirable changes in conjunction with the cultural analysis gave rise to a list of suggestions for potential improvements to the situation. These are considered in this report as *'lessons that have been learned from the pilot which could usefully inform any roll out of the project to other schools and other school areas.'* Ideally these lessons would be debated amongst the stakeholders in order to arrive at an agenda for change, improvement and future roll out of the project. In the present project such debate did not occur, and the suggestions are presented as potential starting points for discussion in developing new projects or considering roll out of the current pilot.



## Appendix 2. Soft Systems Analysis Leading to Lessons for Future Roll-out and to Guide Similar Projects

Soft Systems Methodology is outlined in Appendix 1. This discussion focuses firstly on the Rich Picture of the project situation and the choice of candidate areas to model. The evaluator's cultural analysis of the situation is then described. This is followed by consideration of each modelled system through to suggestions for changes which the evaluator considers to be potentially desirable.

### THE RICH PICTURE

Qualitative and quantitative data collected during the course of the evaluation research, and outlined above were combined to produce the rich picture shown in Figure 22. This is an abbreviated version of a more complex rich picture developed during the course of the evaluation, and is a view of the Generation XP situation as perceived by the evaluator. The boundary of the situation is represented by the solid line enclosing most of the text and images in the diagram. Outside the boundary are entities and comments which relate to Generation XP, but which are unlikely to be affected by the actions of people or groups within the boundary.

The situation is complex and '*messy*.' There were many stakeholders, each with its own worldview and agenda. The situation involved technical, planning, communication and relationship issues. There were also factors involving power and control. In the rich picture, the arrowed lines indicate relationships or the flow of information. Conventionally, such interactions involving strain or conflict are represented by crossed swords.

Text comments encapsulate factual or subjective information expressed by or affecting the various stakeholders.

A cultural analysis of the Generation XP situation is now presented, followed by a logical analysis of suggested areas for improvement.

### Cultural Analysis

The Generation XP project represented a meeting of at least three different types of culture – government, business and schools – and generated its own subculture. Analysis of the cultural aspects of the project is important to indicate which suggestions from the logical analysis are likely to be feasible. The cultural analysis follows Checkland and Scholes (1999).

### Analysis One – Role Analysis

The role analysis considers the perspectives of the client for the evaluation, the '*would be problem solver*' – i.e. the entity or entities wishing to improve the situation, and the '*problem owner*,' – the entity or entities which had the power to terminate the problem situation.

In this case, the client for the evaluation was the Ministry of Education, which commissioned the evaluation research. The Ministry was one of the '*would be problem solvers*'. It had an interest in the sustainability of the project and in improving the outcomes of the project. Microsoft Ltd and the associated business partners involved in roll out and ongoing sustainability also had an interest in improving outcomes. Finally committed schools, too, were interested in improving their performance within the project.

There appeared to be two main problem owners involved in the project. These were again the Ministry of Education, who had the power to cease supporting roll out and sustainability of the project; and Microsoft Ltd who could cease to support the project by, for example, ceasing to sponsor student MOS

examination costs. It is clear to the evaluator that both of these owners wished the project to continue at least for the duration of the contract.

## Analysis Two – Social Analysis

This analysis considers the *roles*, *norms* and *values* of key players in the situation. These are defined as:

*Roles*: social positions recognised as significant by people in the situation

*Norms*: expected behaviours associated with roles

*Values*: criteria for judging performance of role holders based on what is perceived as ‘good’ or ‘bad’ performance by role holders.

Each of these three aspects defines and is defined by the others.

The Social Analysis of the Generation XP project is summarised in Table 9 below. This table includes stakeholders who were seen as key to the central purpose of the pilot which was to prove the concept of making business IT qualifications courses available in schools. Thus it does not include the roles of NZQA, parents or employers.

The Ministry of Education was constrained by the political process to maintain confidentiality about the project until the Digital Opportunities projects were announced publicly on February 7 2001. The time course to implementation and selection of schools was thus telescoped and it was not possible to involve schools in the planning process. The initial project involved five schools, but was extended to eight, including four Gisborne schools. Contracts with business partners were to ensure a better business contribution than could be obtained by the normal tendering and contracting process.

The Digital Opportunities Manager acted as an effective broker between schools and businesses. He responded quickly and effectively to e-mail communication. He made effective decisions throughout the project, including increasing the number of schools involved to eight, cancelling the MCP trial for 2003 and negotiating extensions of equipment rentals etc later in the project. In addition, he had a clear and inspiring vision of the ‘big picture’ of the Digital Opportunities projects.

The ‘*launch phase business partners*’ are those partners which were mainly involved in the start up of the project. They included IBM, Telstra Clear, BCL Ltd and Datacom. They carried out their initial commitments to the project. There was some lack of clarity about responsibility for repairs to equipment later in the project.

Microsoft Ltd and Computer Press were the key ‘*ongoing*’ business partners. They maintained a continuing interest and commitment to schools, Microsoft awarding a paid trip for one successful student to a MOS Master meeting in Florida. Computer Press kept close contact with most of the participating schools and gave informal professional development to schools’ staff. Schools had some criticism of the staff training supplied at the beginning of the project by another organisation.

Schools had varying commitment to making the project succeed. The former Ministry ICT Manager thought that ideally schools needed to be hand picked or to volunteer to be involved. They needed to have a real commitment from principal, board and staff to the project’s success. The time course to establishment of the pilot and other constraints meant that this was not possible. In the event, the most successful schools were those which were most committed. Part of the commitment is perceived by the evaluator as having and maintaining a suitably committed, trained and qualified pool of staff to run



the pilot. Schools which did not do this tended to be less successful. They also tended to be less open in communication.

Some schools and teachers promoted the courses effectively to students, but others did little to inform them about the courses, especially in 2002. Because of pressure of work and industrial problems, few staff continued with appropriate professional development during the pilot. In addition, not all schools dealt quickly and effectively with infrastructural problems. Lack of appropriate technical support may have been a factor in this. Teachers and coordinators varied in the quality of communication with the evaluator.

The evaluator attempted to communicate appropriately and regularly with stakeholders and to collect appropriate data. This was not always easy, especially during the latter part of 2003. In retrospect, it could have been more effective to carry out a final visit to schools in Term 3 2004, but the evaluator decided on budgetary grounds not to do this. He chose the SSM processes in the evaluation because it promised to be an effective and rigorous procedure to arrive at lessons and suggestions.

### **Analysis Three – Political Analysis**

The principal power relations within the project are listed in Table 10 below.

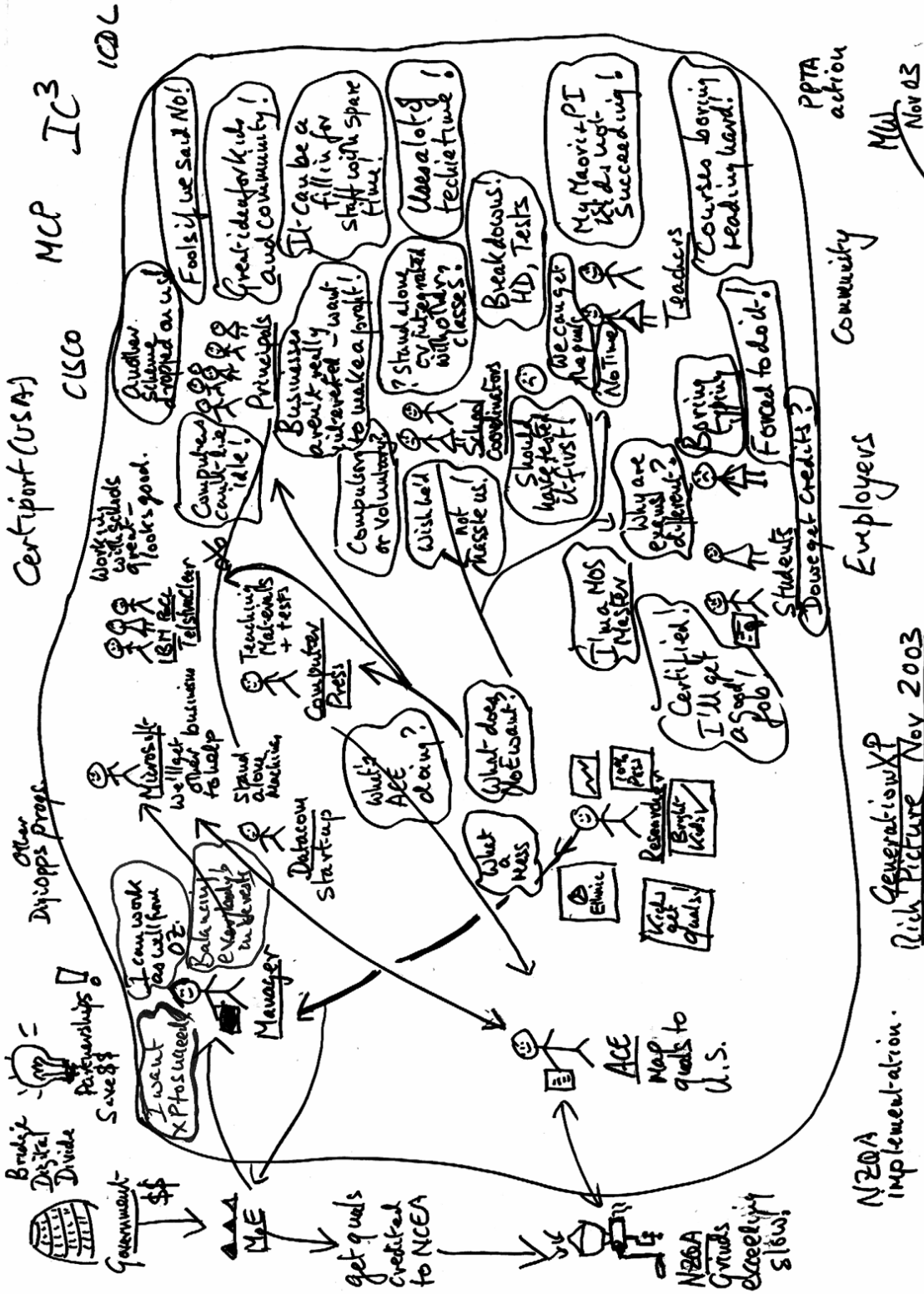
The power relationships at the higher levels of the project – Ministry and Microsoft – appeared to be clear cut and relatively unambiguous. It was at the level of the schools and below that power issues seemed to emerge. The position seemed to be clearest where schools were truly committed to the project, notably in the case of the Gisborne lead school. In this school, the project was well staffed and supported, communication with interested parties was good and infrastructural problems were sorted out quickly. Students supported the project enthusiastically. Other schools were characterised by failure to provide adequate staffing and resources for technical support to maintain the infrastructure, communication was lacking, and students resisted studying the courses. Few students took the examinations in these schools.

It is likely that many of these problems could have been avoided by hand picking participant schools which were enthusiastic and committed to the success of the project; and involving them in a true partnership from the inception of the project. It will be interesting to observe the degree of commitment and success rate of the new schools involved in the roll out of the project.

### **Summary**

1. In future roll outs and similar projects, identification of committed schools and their full involvement in the partnership is likely to guarantee project success.

Figure 22. Generation XP Rich Picture



## LOGICAL ANALYSIS

### Problematic Areas and Candidate Systems for Modelling

After reviewing the rich picture and the source data, the evaluator extracted a number of issues and tasks which appeared to be important in the establishment, sustainability or future roll out of the project to other schools and school areas. These are summarised in Table 11.

Some of the issues listed above were addressed during the course of the project. One example was the issue relating to *'placing the qualifications on the NCEA framework.'* Registration and credit inclusion of these commercial courses was a new situation for NZQA. During 2003, new procedures were implemented which should make future commercial courses much more quickly processed.

Some of the issues seemed to be key to improvements in the Generation XP situation. These issues, along with the key primary task of teaching and testing the qualifications, were chosen for modelling using the SSM logical stream of analysis. The relevant systems are printed in bold text in Table 11. The modelling will now be outlined.

**Table 9. Analysis Two –Social Analysis Roles, Norms and Values**

<b>Roles</b>	<b>Norms</b>	<b>Values</b>
Ministry of Education	Carry out Government policy Establish project and partnerships Oversee project Commission evaluation research Involvement in future roll outs Ensure appropriate professional development	Maintain appropriate confidentiality Select appropriate schools Appoint suitable manager and evaluator Learn lessons from pilot Ensure appropriate funding Set up appropriate contracts with stakeholders
Ministry of Education Digital Opportunities Manager	Overall management of project Coordinating partnership between stakeholders Having 'big picture' of Digital Opportunities projects	Being easily accessible Being responsive to project and stakeholder needs Being a good 'broker' Being well informed Making appropriate decisions
Launch phase business partners	Supply, set up and maintain or repair infrastructure	Honouring commitments Rapid response to faults or infrastructural problems
Ongoing business partners (including project leader)	Maintain teaching and testing facilities Provide initial training to school staff Monitoring progress of project Involvement in future roll outs	Continuing interest in and commitment to project Maintain real interest in participant schools Supply appropriate initial training Keep staff trained/updated concerning upgrades
Schools (Principals and boards)	Becoming involved in project Being committed to project's success Reporting openly on project's progress	Making and keeping real commitment to success of project Allocate committed, qualified staff Maintain pool of appropriate expertise Ensure staff's PD Publicise project to students, parents etc Communicate regularly and openly with other stakeholders on progress Meet commitments of contract
Teachers and coordinators	Recruit students to the projects Master the content Teach the courses and administer examinations Ensure that infrastructure is maintained so as to deliver resources and examinations Monitor and report progress	Promote courses to students Gain appropriate training and PD Report faults and ensure they are rectified Communicate progress regularly and openly to appropriate parties
Evaluator	Report on progress Evaluate project Make suggestions about lessons learnt and possible improvements	Communicate regularly with stakeholders Gather appropriate data Evaluate data Draw conclusions concerning desirable and feasible changes to project preferably in conjunction with stakeholders

**Table 10. Analysis Three -Political Analysis**

<b>Power Held by:</b>	<b>Nature of Power</b>	<b>How Power is Wielded or Used</b>
Ministry of Education, wielded by the Digital Opportunities Manager	Budgetary and Financial Political Brokering	Allocating financial resources Deciding which schools to include in the project Deciding about ongoing scope of project e.g. cancelling MCP in 2003 Extending contracts for equipment Facilitating sorting out problems with businesses Encouraging schools to stick to commitments
Microsoft Ltd	Financial Planning	Investing in project and roll out Overseeing business side of project management Subsidising student examinations
School boards and Principals	Executive and Planning Resource Allocation Information	Decision to join project Decision to continue with project Staffing Funding support within school Communicating information on project
Coordinators/Teachers	Management Information Teaching	Ensuring day to day functioning and support of project within school Communicating information on the project Teaching courses effectively
Technicians	Maintenance	Ensuring that infrastructure works and meets demands made on it.
Students	'Grass roots' Power	Students could wield power by deciding not to study the courses or take the examinations

**Table 11. Some Key Tasks and Issues in the Project**

<b>Task/Issue</b>	<b>Relevant System</b>	<b>Comment</b>
Teaching, learning and testing student knowledge (Task)	A Teach/Learn/Test system	Finding ways to teach the courses effectively, so students gain knowledge and achieve the qualifications
Partnership (Issue)	System to foster fruitful partnerships	Communication and understanding of different world views of schools and businesses Differences in perspectives between businesses and schools Partnership planning of project from the start
Determining who achieves and who enrolls? (Issue)	Student selecting system A Teach/Learn/Test system	Project fails to bridge digital divide Publicising the courses Ways to encourage Pacific and Maori students to succeed Instructional system Teacher training and 'enculturalisation' Resources Pedagogical Model Very low percentage of students achieving
Placing qualifications on the NCEA Framework (Task)	A system to place qualifications on the Register and to obtain credit inclusion quickly	The process has been frustratingly long for schools and may have resulted in some losing enthusiasm for the project
Teacher education (Issue/Task)	Teacher MOS Training and PD System Teacher 'enculturalisation' system	Some teachers delivering the courses are not qualified I(C)T teachers Pre course training was seen to be inappropriate Ongoing teacher training inconsistent and not necessarily relevant Many schools not succeeding with Maori and PI students
Getting program integrated with school infrastructures (computer and curricular) and ensuring that these systems run from start (Task)	System to foster fruitful partnerships A system to address differences in perspectives between businesses and schools IT (business) system	Many problems at start from attempts to integrate Generation XP computers with school networks Businesses did not appear to appreciate schools' issues re resourcing numbers of computers Much school technician time spent sorting out these problems, putting strain on budget
Hardware failures (Issue)	Fault remedying system	Much school technician time spent sorting out these problems putting extra strain on budgets Unacceptably high rate of hard drive failures
Ensuring minimum disruption to teaching and testing by system upgrades (Issue)	Upgrade implementation system	Expense and delays from upgrading MS curriculum and testing

## Logical Analyses Leading to Model Systems

### The Teach/Learn/Test System

The *raison d'être* of the project was to enable selected students to gain Microsoft Office specialist and other industry level qualifications. Thus this system is a primary task system. A root definition of this system is given in Table 12 below.

This root definition explicitly states that the customers of the system will be targeted students. This statement was included because the focus of the Digital Opportunities projects was *'turning the digital divide into a digital opportunity...if children from poor or rural areas are left behind, there is a high chance that they will never catch up.* (Clark and Mallard, 2001) In another document (Cabinet Finance Committee, 2000) it was asserted that *'some groups are not achieving in education at the same rates as other students'*, and that *'these pilot proposals will directly impact on ...those from Maori and Pacific populations...If the pilot projects are effective, the research should indicate that Maori and Pacific women and men are achieving to a higher standard in mathematics, science and technology, and that student participation is increased in the senior secondary school.'*

In order to create a conceptual model of this system, the key activities from the root definition were taken and arranged in a logical order. Subsidiary activities necessary for the key activities were also identified. This process is outlined in Table 13. It is to be noted that some of the necessary activities for the system, such as training the teachers and selecting the students are part of the environment of the system, and are not part of Teach-Learn-Test subsystem *per se*.

The evaluation showed that *appropriate environment and culture (including teacher attitude)* had a crucial effect on the success of the project within schools. The most successful school had a coordinator who, whilst not agreeing with the pedagogical model of the MOS courses, 'went the extra mile' to help his students succeed, whilst those schools where the courses were compulsory, and teachers did not generally appear to be as committed, were least successful

The activities and root definition were used to generate a conceptual model of the Teach-Learn-Test system. (Figure 23). The upper part of the figure enclosed within the large boundary is the primary task system. It includes the minimum number of activities considered crucial to an effective MOS teach/learn/test system. Note that some essential activities and resources (e.g. training the teachers, the Certiport examinations) are outside the boundary of the system. The process of teaching and testing the students can be followed by tracing through the activities linked horizontally at the bottom of this task system. Prerequisite activities which need to be done for these main activities to occur are shown above the horizontally linked activities. An example is accessing Certiport Exams.

The system enclosed within the lower boundary represents a monitoring and control subsystem. Its purpose is to monitor activities within the task system, and to compare the performance against pre-defined performance criteria. These criteria could include working within environmental constraints, and achieving goals agreed with stakeholders such as the Ministry of Education.

Having set up the conceptual model of the Teach/learn/test system, lessons can be learned (or suggestions for desirable changes can be made) by comparing this system model with the actual real life situation. This is done in Table 14.

The above comparison led to the evaluator putting forward the following lessons/suggestions for improvement to the teach/learn/test component of the project. The aim of these suggestions would be to improve student learning and qualification rates especially for Maori and Pacific Island students.

1. It will be helpful to establish realistic and meaningful performance criteria for schools to work to, and encourage schools to establish effective monitoring and control systems.
2. Teacher selection, initial and ongoing training was seen as crucial to the success of the programme. Teachers need encouragement to reflect on their performance. Using unqualified teachers in MOS classes was not successful and should be discouraged.
3. If the aim is to be to improve the qualifications of Maori and Pacific students, the environment and courses would need tailoring to their needs. This could include greater teacher encouragement, modified course materials and teaching styles.
4. The need was highlighted to create teaching resources relevant to New Zealand school students.
5. It would be important to provide sufficient teaching resources for numbers of students enrolled.
6. Students would be helped by sourcing or producing relevant formative assessment materials with the same format as the qualifying examinations.
7. Schools would need funding for sufficient technical support to ensure that their systems are adapted quickly to cope with upgrades.

**Table 12. The Teach/Learn/Test System Root Definition**

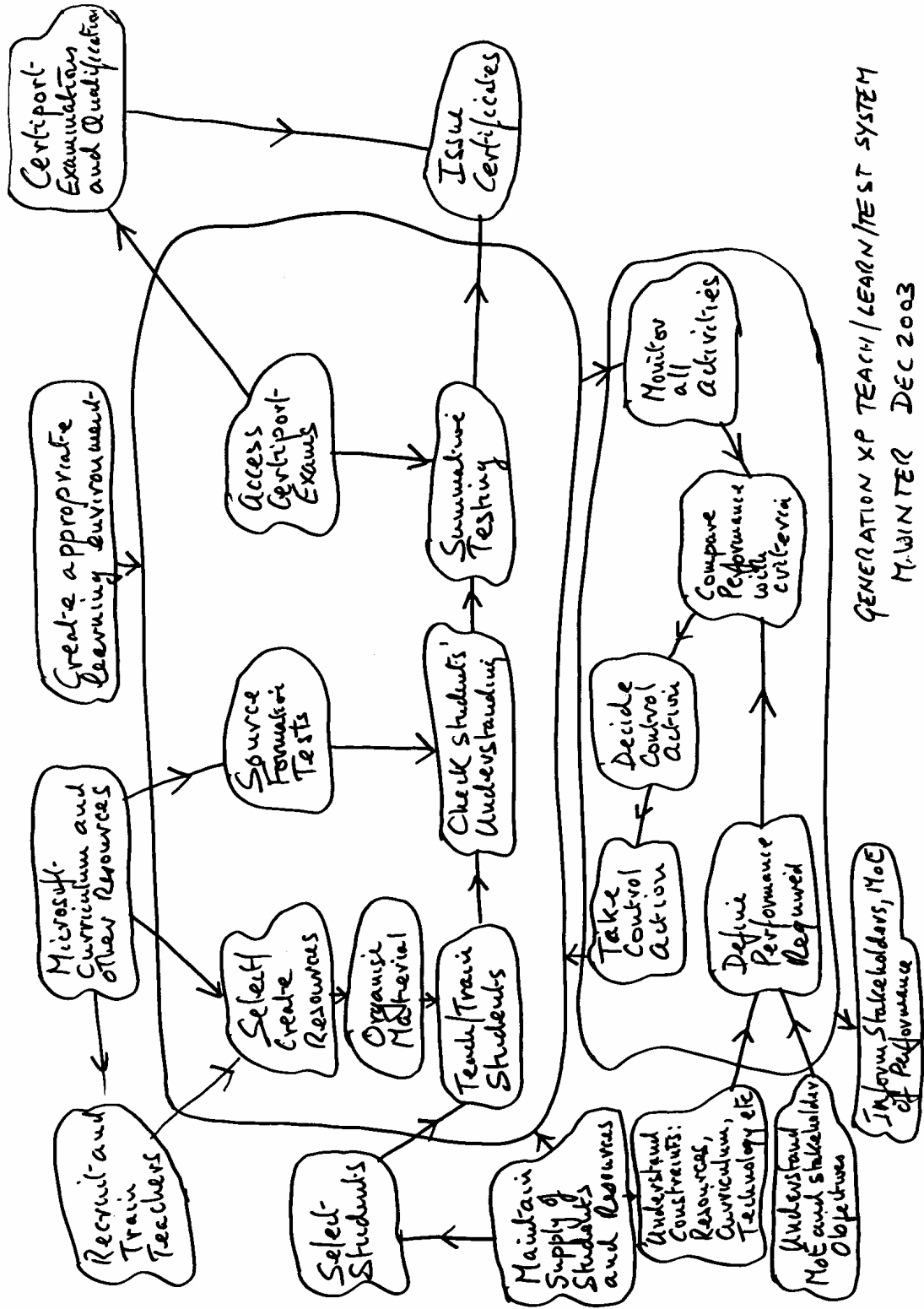
A system to train low socioeconomic and targeted ethnicity students to achieve MOS qualifications by face to face teaching and learning, pretesting and on-line assessment. The system takes into account the Microsoft curriculum, the availability of appropriate teaching resources, including teachers, and the constraints of the on-line testing system.	
Customers	Low socioeconomic and targeted ethnicity students
Actors	Teachers
Transformation	Unskilled students → Students with MOS Qualifications
<i>Weltanschauung</i>	That it is desirable to bridge the digital divide between students attending low decile schools and those more privileged That giving the students the opportunity to achieve these qualifications is beneficial to them and to society in economic and employment terms The demands made on students and teachers are reasonable
Owners	Ministry of Education
Environmental Constraints	The Microsoft Curriculum, the communication system, (technology), availability of students, school policies availability of teachers, availability of students, commitment of students



**Table 13. Activities and Logical Dependencies in Teach/Learn/Test System**

Activities included or implied in Root Definition	
<ul style="list-style-type: none"> <li>• Training</li> <li>• Teaching</li> <li>• Learning</li> <li>• Pretesting</li> <li>• Assessing (Summative)</li> <li>• Qualifying</li> <li>• Accessing Resources</li> </ul>	
<b>Logical Sequence of Activities</b>	
Action	Depends on
Qualifying	Access Certiport Examination and qualifying procedures
	Students passing examinations
	Students being examined
Summative testing	Students demonstrating sufficient understanding
	Checking students' understanding (formative)
	Using formative tests
Having sufficient understanding	Learning the material
Learning the material	Teaching and training
	Appropriate environment and culture (including teacher attitude)
Teaching and training students	Selecting the students
	Organising and presenting content
	Selecting/creating resources
Handling content and resources	Understanding the content
	Knowing what is available
Understanding the content	Training the teachers

Figure 23. Teach/Learn/Test System Conceptual Model



GENERATION XP TEACH/LEARN/TEST SYSTEM  
M. WINTER DEC 2003

**Table 14. Comparison of Teach/Learn/Test System Conceptual Model with Real World Situation**

Activity	Exist in Real Situation?	How was it done?	How is it judged?	Comments
1. Teach/tra in students	Yes	<p>Various:  <b>Successful schools:</b> culture of success in schools. Teachers encouraging and 'go extra mile,': created own resources, supplemented with on line resources, used tests to guide responses to student needs, supplementary time at lunch time or after school active teacher support, mini teaching sessions, taught as stand alone or voluntary courses alongside other ICT courses.  <b>Less successful schools:</b> Compulsory courses, unqualified teachers, courses regarded as 'boring', students not given positive feedback, students worked through the books.</p>	<p>Checking student understanding with formative and summative assessment. Teacher reflection on practice (especially in successful schools).</p>	<p>How to encourage teacher reflection?            How to use only ICT qualified teachers?            How to enthuse teachers?            Level of success measured by MOS pass rate very low (10% of MOS students) and concentrated among European and Asian students. General lack of success in passing and specific lack of success of Maori/Pacific students indicated failures in Teach/learn/test component in classroom. Tailoring approach to suit these students including much higher level of teacher encouragement and interaction helped success.            Curriculum and teaching/testing approaches very structured and NZ students may find it hard to adjust. Reading ages of official texts very high. Locally produced resources may help.            Teachers appreciated not having to design courses</p>
2. Checking Understanding	Yes	<p>In most cases via practice tests on the CD supplied. Some schools also used practice test material from on-line resources such as <a href="http://www.customguide.com">www.customguide.com</a></p>	<p>By student mark on practice tests. Used by some schools as gateway to the 'real' exams.</p>	<p>Practice CD had limited range of questions and some students rote learnt answers and did not understand processes. Practice question format differed from 'real' exam. Was this fair? <a href="http://www.cheat-test.com">www.cheat-test.com</a> claims to supply 'real' exam questions.</p>

Activity	Exist in Real Situation?	How was it done?	How is it judged?	Comments
3. Summative testing	Yes	On line via Certipoint Inc. Exams set, marked and result returned on line. Successful candidates received certificate within days.	Are tests available when needed? Does the process test what students have been taught? Can students understand questions and work fluently with exam format?	<p>Significant problems with testing system initially and due to upgrades. Resulted in serious delays for some students. Disappointing for some students who had prepared for tests and had system crash. When system worked it worked well. Concerns over difference in question format from practice tests. Indications of occasionally material not in courses tested. Sometimes actual pass mark differed from indicative pass mark. Teachers appreciated not having to set and mark tests. Students appreciated rapid feedback and certificates. They regarded exams as 'fair'</p> <p>Some schools rationed student attempts to take exams to those who were 'ready' so as not to 'waste' vouchers. Others, including most successful school were more likely to let students 'have a go' and use experience formatively.</p> <p>Students interviewed tended to rate the supplied texts higher than the teachers. Reading age assessments of the Step by Step texts showed them to be significantly higher than other resources including school produced materials, NZ produced ICT resources and other MOS texts. Some schools complained of being issued insufficient numbers of books, claiming ten books were not enough for classes of 20 to 30. One school was supplied with only four <i>Word</i> texts.</p>
4. Selecting and creating resources	In some schools	Most schools used Microsoft <i>Step by Step</i> material supplied for the pilot without modification. Other schools supplemented this with their own material or Unit Standards course material. Two schools sourced alternative coursebooks they perceive as more suited to their students. Computer Press Ltd, which held the rights to MOS training courses in NZ, arranged for MOS resources designed for NZ schools to be produced locally.	Subjectively – do the resources look attractive, are they easy to read, do they relate to the students' world, are they easy to use?	
5. Organising content	In some schools.	In some schools teachers organized the material to fit alongside taught alongside MOS. In others, students worked through the texts in sequence – little extra organizing took place. One school experimented with linking MOS courses to thematic work in technology.	Does the sequence of MOS content complement/extend other material?	Schools which taught MOS material by itself had less need to organize content other than ensuring that MOS Expert courses were taught after corresponding MOS core material. Teachers compared MOS material with Unit Standard material as between making perfect bricks compared with designing and creating a building. MOS focuses on minutiae. Ability to organize course material depended on teacher familiarity with course – hence need for teacher training.

Activity	Exist in Real Situation?	How was it done?	How is it judged?	Comments
6. Sourcing formative assessment resources	Yes	Most schools used the CD material supplied with the MOS courseware. Some also used material sourced from on line sites such as www.customguide.com. These latter schools tended to have greater student pass rates On line access	Do the practice test resources adequately predict student performance in the 'real' examination? Is the testing suite accessible on demand?	Practice CD material had a format different from that of the examination. Variations in format occurred as courses were updated.
7. Access Certipoint Exams	Yes			In the early stages of the project, difficulty was experienced due to the way some schools had their systems set up. In 2003, the testing suite was upgraded. This led some schools to have difficulty accessing the suite. It took some schools months to resolve the problem. Technician availability could be a factor. When suite functioning correctly, access was very satisfactory.
8. Monitoring and Control Subsystem	Partially			Schools did not appear to have clear performance criteria for the project, or for the teach/learn/test subsystem. Criteria in the contract with schools (MoE 2001 a) specifies to <i>enhance the educational achievement of the students and community particularly in trade education courses and to help overcome barriers of access, ability and attitude</i> . The work to be reported on by schools included numbers and class levels of students, longitudinal assessment data to determine results of programme, report on effectiveness of content development. In the opinion of the evaluator, neither schools nor MoE had clear performance criteria for the project other than as proof of concept.

## A Student Recruitment and Retention System

An anticipated outcome of the Digital Opportunities pilots, mentioned when describing the Teach/Learn/Test system, was that Maori and Pacific students would achieve to a higher standard in technology. Discussion with the Ministry of Education's former ICT Manager revealed that whilst this outcome was important, it was not the key factor in the project. However, in order for the Generation XP project to produce this outcome, it would be necessary for significant numbers of these students to enrol in the MOS courses and to succeed in the training.

Although there was variation between schools, the general picture was that lower percentages of Maori and Pacific students enrolled in the pilot than were enrolled in the senior classes of participating schools. If an aim the pilot were to improve *selectively* achievement of Maori and Pacific students, then this would imply the need to improve recruitment of these students to levels above those in the general senior school population in the participating schools as well as in the country as a whole. Location of the pilot schools in West Auckland and Gisborne resulted in recruitment of a higher percentage of Pacific students than the general population in the Auckland schools, and a much higher percentage of Maori in the Gisborne schools. However, the percentages of Maori in the Generation XP programme generally were the same or less than the representation in the respective schools' senior populations. Numbers of Pacific students enrolling in MOS courses was very low, and a reliable picture of their percentage enrolment relative to the schools' senior populations could not be obtained.

One way of increasing the percentage participation of Maori and Pacific students in the project would be to make ethnicity one of the criteria schools used to recruit participants. This form of discriminatory recruitment is unlikely to be politically acceptable. A possible approach would be to make the courses especially attractive to the target students and to give them ongoing encouragement.

The goal of selectively helping Maori and Pacific students to improve their achievement through this project would need to be approached by involvement of the respective communities in designing and researching how to address the issue. The following is a tentative suggestion for a system which could improve enrolment of Maori and Pacific students in the project.

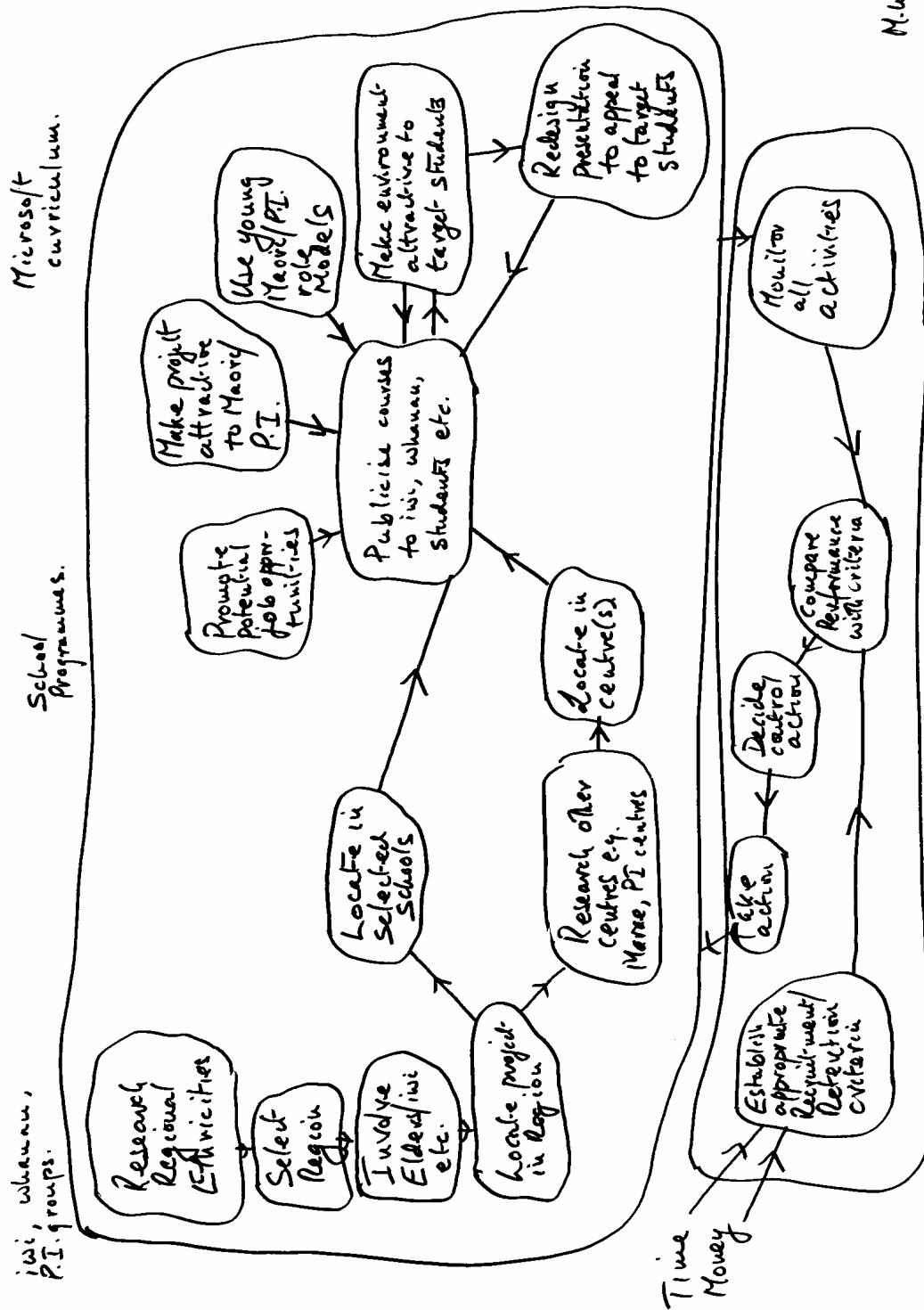
The individual steps in the process of development of this and subsequent systems, and their comparison with the real world situation will not be described in detail since they are similar to that used for the Teach/learn/test system described above. The root definition is given in Table 15..

**Table 15. Student Recruitment and Retention System Root Definition**

A system to improve recruitment and retention of Maori and Pacific students in the Generation XP project by locating the project appropriately, working with iwi to publicise the courses and making the courses relevant and the learning environment attractive to the students in order to upskill these students in IT applications	
Customers	Iwi, whanau, Pacific groups, students
Actors	Iwi, schools, MoE
Transformation	Maori and Pacific students not involved in the IT training programme, or who drop out → Maori and Pacific students involved and retained in the programme
Weltanschauung	One of the goals of ' <i>bridging the digital divide</i> ' in NZ was improve Maori and Pacific students' achievement in technology
Owners	Iwi, Pacific groups, MoE, schools
Environment	An environment in which certain groups are seen as disadvantaged. The IT training curricula and materials.

The conceptual model for this system is shown in Figure 24, and the comparison of the model with the real world situation in Table 16. In order to work effectively to recruit and retain Maori and Pacific students in the programme, it would be necessary and culturally appropriate to involve elders, iwi and Pacific Island groups in the process at an early stage. The conceptual model begins by research in and selecting target region(s) to locate the programme. Once the region(s) were selected, Maori or Pacific Island community leaders would be involved in the process. This was not done in the pilot project (Table 16). It may be that schools prove not to be the most appropriate locations for the programme, hence it is suggested from the model that other centres – e.g. marae- be investigated. Whatever centre(s) are chosen, it would be necessary to publicise and promote the courses appropriately to students, elders and whanau. Aspects of this promotion could involve potential job opportunities for course graduates, making the project culturally attractive and enlisting the help of young Maori and Pacific MOS graduates. It would also be necessary to make the learning environment and culture attractive to these students, and probably to redesign the course presentation to appeal to the target students.

Figure 24. Recruitment and Retention Conceptual Model



Generation X.P. Recruitment and Retention Conceptual Model Dec.03.

M.W.



**Table 16. Comparison of Recruitment and Retention Conceptual Model with Real World Situation**

<b>Activity</b>	<b>Exist or not in real situation?</b>	<b>How was it done?</b>	<b>How is it judged?</b>	<b>Comments</b>
Research and select regions	Yes	Partly in response to political suggestion	Project established in regions with high Maori and Pacific populations	
Involve elders/iwi/Pacific community leaders	No		Leaders aware and on side with the goals of the projects	Timescale to establishment was too short. For improved uptake by Maori and Pacific students, this is seen as a crucial step
Locate project in selected schools	Yes	Schools chosen on basis of location, ethnic mix and decile rating	Do target schools have appropriate ethnic and socioeconomic mix?	MoE ICT manager recommended that schools should be selected on the basis of their commitment and wanting to be involved. Committed schools are believed to be likely to produce better results
Research and locate project in other centres – e.g. marae etc	No			This could open up the opportunities to students involved in alternative education programmes. The community environment could be more attractive than the schools. Raises issues of staffing and whether courses would be run during the school day or out of school hours.
Publicise courses	Partly	Most schools publicised the courses to students in their Year 12 option book, by word of mouth, during assemblies etc. In some schools the potential career benefits were mentioned. There did not seem to be publicity to parents, elders etc.	Is the community behind the courses?	There is great scope for improving publicity. Courses would need to be seen to be attractive to Maori and Pacific students, and use of young role models would help. Within schools, improved publicity could be linked to making the whole ICT programme more attractive and engaging for these groups.
Make environment attractive to target students	In some schools, partially		Do target students want to be there?	The environment of the computer room did not appear to be very acknowledging of Maori or Pacific culture. Grouping of computers in pods may help. This could be emphasized in the publicity.
Redesign presentation to appeal to target students	To a limited extent	Some schools produced their own teaching resources and emphasised positive approaches. One linked MOS training with technology thematic studies.	Do students enjoy their learning and want to do more?	Making the learning culturally relevant and varying teaching approaches to suit various learning styles. Using NZ produced resources. Probably limited scope for flexibility given the nature of the course curriculum and the examination structure.
Monitoring and control system	Not obviously		A target percentage of students overall and/or within schools/centres are enrolled.	There were no apparent quantitative ethnicity targets for the project/

There are several factors which would need to be taken into account when considering the feasibility of this model. The first is the need to involve Maori and Pacific communities in the project to a much greater extent than appears to have been done in the pilot. The evaluator is aware of the interest of Te Puni Kokiri in the project in the early stages, but is unaware of the extent, if any, to which TPK and Maori and Pacific groups were involved in setting up and running the project.

The pilot was located in schools. The patchiness of the results in the various schools and the experience of the ICTPD cluster schools indicated that the best results would be achieved by teachers with a real commitment to the project. (Ham et al 2002).

It was suggested to the evaluator that it may be possible that Maori and Pacific youth would be more attracted to the project if it were located in places in which they felt more at home, such as marae and Pacific community centres. The location of Digital Opportunities projects in a marae environment is not without precedent, since one of the Digitally Boosted Study Support Centres was located at Murihiku marae in Invercargill. Alternative education Maori students of secondary school age used the ICT resources during the school day.

In order to recruit higher numbers of the target groups, publicity and revamping the courses and environment is seen as crucial. Suitably dedicated and empathetic staff would also be vital. The question of making the courses culturally relevant and varying teaching approaches would present probably the severest challenge, since the curriculum is set offshore by Microsoft, and the examinations have a fixed format, and are also set and administered from the United States.

## Summary

1. In order to increase numbers of Maori and Pacific students taking the courses, it is suggested that target levels are set.
2. Local iwi and Pacific community leaders should be involved in planning roll outs of the project.
3. The project could be located in marae and other community centres as well as schools.
4. Publicising the courses among the target communities is seen as vital.
5. Courses and presentation would need to be adjusted to be attractive to target students. This could be difficult given the nature of the content and assessment regime.

## A Teacher Training and Professional Development System

At the start of the project, teachers from the pilot schools were given training by Auldhouse Ltd. This training took place in two sessions, and was intended to prepare teachers to teach the MOS courses. It was received with mixed feelings by the participating teachers. Most schools sent several teachers, not solely those who were to teach the MOS courses. The intention was presumably to raise competence and awareness levels of ICT within schools' teacher communities.

Several teachers commented to the evaluator that they thought the trainings were inappropriate, time wasting and pitched at the wrong level. The response to the second part of the training tended to be more positive. It was seen to be focused more on the examination environment of MOS. Some teachers wondered why teachers other than ICT specialists were on the training.

During the two years of the project, significant attrition of the trained group of MOS teachers occurred, and several MOS classes ended up being taught by non-MOS qualified staff. This appeared to have a negative effect on student outcomes. Furthermore, during the course of the project, there were upgrades to the MOS course content and examinations. Teachers needed further development to cope with these changes.

No formal professional development of MOS teachers took place during the second year of the programme. Some informal work was carried out during the second year on an *ad hoc* basis, and also by the coordinating teacher appointed to the project from school H.

Some teachers from participating schools attended *Navcon* in 2001 and 2002.

The following system, outlined in Table 17 and Figure 25 is a suggested approach to improving teacher initial training and ongoing professional development. Table 18 summarises differences between this model and the real world situation. Some key suggestions for improving initial training and professional development for MOS teachers which emerged from the comparison are summarised below.

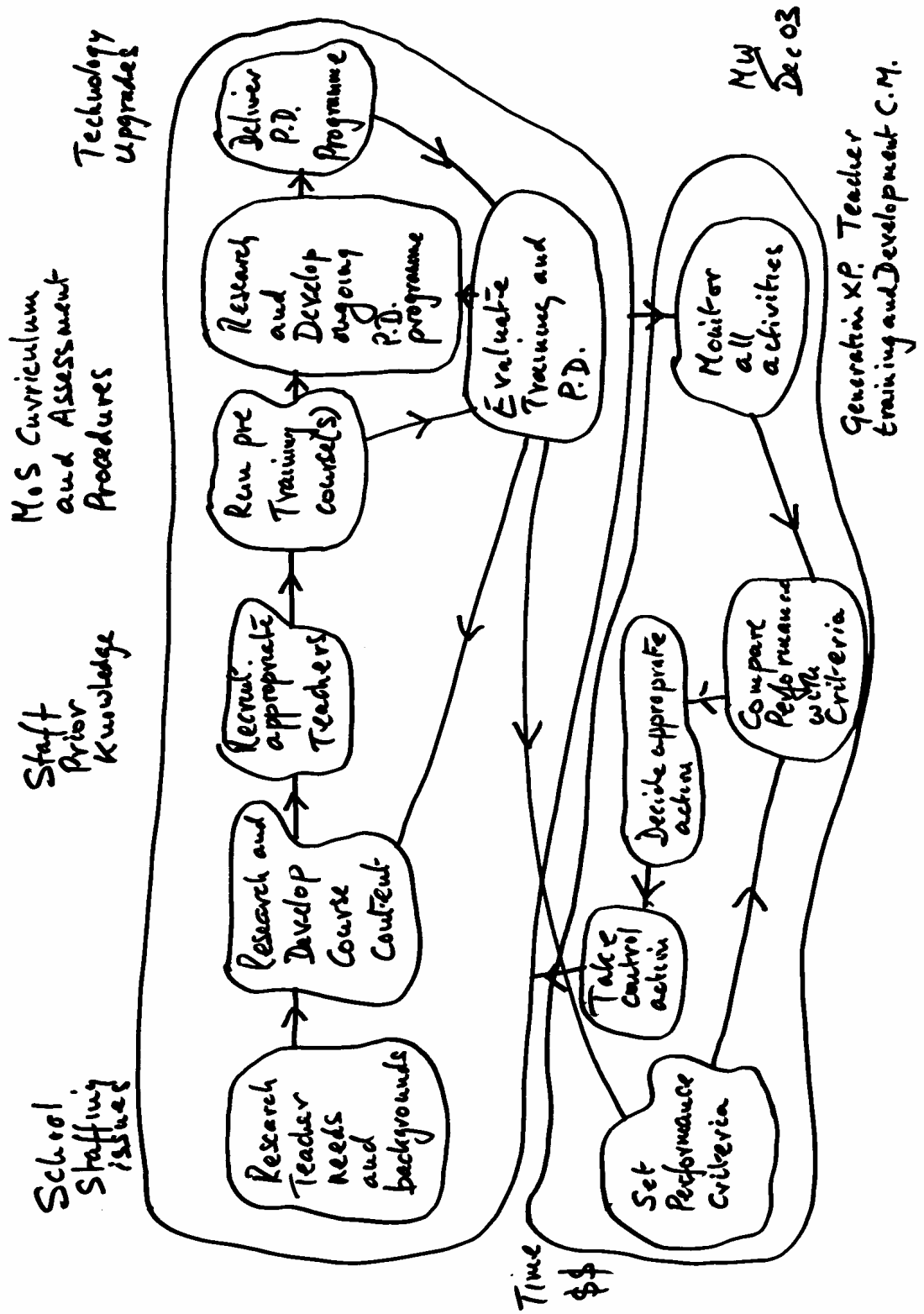
### Summary

1. Staff training and professional development would need to be carefully targeted to the staff who teach MOS courses.
2. New MOS teachers would need training, and ongoing professional development of MOS teachers is needed to enable them to cope with upgrades to the curriculum and technology.
3. One of the business partners has developed an initial training package to assist start up in new MOS schools.

**Table 17. Root Definition of Teacher Training and Professional Development System**

A system to train and develop teachers to deliver the MOS courses by means of pre-training courses and ongoing Professional Development in order to ensure that the teachers understand the content, its delivery and the examination procedure, and enhance student learning.	
Customers	MOS Teachers, (students)
Actors	Experienced MOS teachers, Business Partners, Training Agencies
Transformation	Untrained potential or actual MOS teachers → Teachers confident and competent to teach the courses, and abreast of ongoing developments
Weltanschauung	It is desirable to improve student learning outcomes from the programme Such improvement is likely to result from appropriate training and continuing development of teaching staff
Owners	Schools, Ministry, Business Partners
Environment	Microsoft curriculum and procedures significantly different from New Zealand courses Frequent upgrades of curriculum and examinations Few students gained the qualifications Significant teacher attrition from the Generation XP project – hence new teachers would need training

Figure 25. Teacher Training and Professional Development Conceptual Model



**Table 18. Teacher Training and Professional Development - Comparison of Conceptual Model with Real Life Situation**

Activity	Exist or not in real situation?	How was it done?	How is it judged?	Comments
Research teacher needs and backgrounds	Partially	According to the Microsoft spokesperson, 'a lot of research was put in to determining the teachers' capabilities prior to the training'	By assessing whether the training met teachers' needs and was pitched at appropriate level.	Many teachers complained that the training was 'a waste of time' and that it was pitched at the wrong level. The first course, especially, seemed to be an introduction to the programs rather than how to teach the courses. Better assessment of their needs, possibly by interview and/or survey would be appropriate.
Research and develop course content	Yes	?	Did course content meet needs of teachers who needed to learn how to deliver the MOS training and administer the examinations?	See above
Recruit appropriate teachers	Partially	Evaluator suspects by asking schools to nominate teachers	Were the teachers recruited those who taught MOS courses? Were new MOS teachers trained to replace those lost through attrition?	Many teachers who went on the courses did not teach MOS courses. Focus would be clearer and courses easier to design if courses restricted to MOS teachers. Computer Press developed a training package for new schools joining the MOS training programme.
Research and Develop ongoing P.D. programme	No		Was ongoing PD upskilling MOS teachers on an ongoing basis, especially helping them to handle new upgrades to the material and technology? Did it help them to develop/share innovations in the teaching process?	Ongoing PD tended to be on haphazard basis. Some PD offered by Computer Press when in schools, also some offered by Generation XP coordinating teacher. Offering teachers trips to conferences gave them general ICT PD, but did not help train them for running MOS. Coherent ongoing PD programme would be needed.
Deliver PD programme	No			
Evaluate Training and PD	?			Follow up evaluations should be carried out to guide development of future training and PD programmes
Monitor and Control system	?			The training and PD needs to be monitored and compared with performance criteria which take into account training and PD needs. Cost, time availability and schools' staffing issues.

## A System to Foster Fruitful Partnerships

Discussion with the Ministry of Education ICT Manager who was responsible for overseeing the initial phases of the project revealed that the Digital Opportunities projects were originally set up as responses to certain businesses' concerns over the skills base of the New Zealand population, and their wanting to act positively to improve the situation. The projects, including Generation XP, were conceived as partnerships between business and government to address the problem. The extension of the partnership concept to include schools as well as business and government was a later extension.

Because of the nature of the political process surrounding the establishment of the project, and the timing of the initiative, it was not possible to involve schools in the initial planning process.

During the course of the pilot, coordinators, teachers and principals frequently commented to the evaluator that the project did not involve a 'true' partnership between schools, Ministry and business. This is not surprising in view of the way the partnership was established. Schools commented that they did not feel that they had had any significant part in the planning of the project, and that the project had been '*dumped on*' them on a take it or leave it basis. They felt that the time course from initiation to implementation of the pilot had been too rushed, and did not take into account the realities of the schools' other commitments. They also felt that the original intention for the Generation XP suite of computers to be isolated from the rest of schools' networks was unrealistic.

In 2003, when the evaluator asked schools about the partnership, several coordinators asked '*what partnership?*' They reported that there had been no contact from all but one of the business partners during the year.

On the other hand, business partners seemed to have various perspectives on the project. Some were clearly involved in the project mainly in the initial phases. These include suppliers of the infrastructure. Others more involved with the provision of training and testing materials continued their involvement throughout the life of the project. Most of the business partners' representatives had expressed ongoing interest in the project when interviewed by the evaluator, but had not had contact with schools other than to deal with problems. Some school coordinators and principals were surprised that businesses had not taken advantage of the social good aspect of the project in their publicity. In October 2003, the Ministry's project manager commented that in future the preferred model may be to involve businesses in straightforward business contracts rather than partnerships.

These views were echoed in the Digitally Boosted Study Support Centres project which was also evaluated by the current author (Winter, 2004).

In view of these comments, the evaluator chose to develop a model partnership system. The Root Definition of this system is given in Table 19. The root definition was used to develop the conceptual model shown in Figure 26.

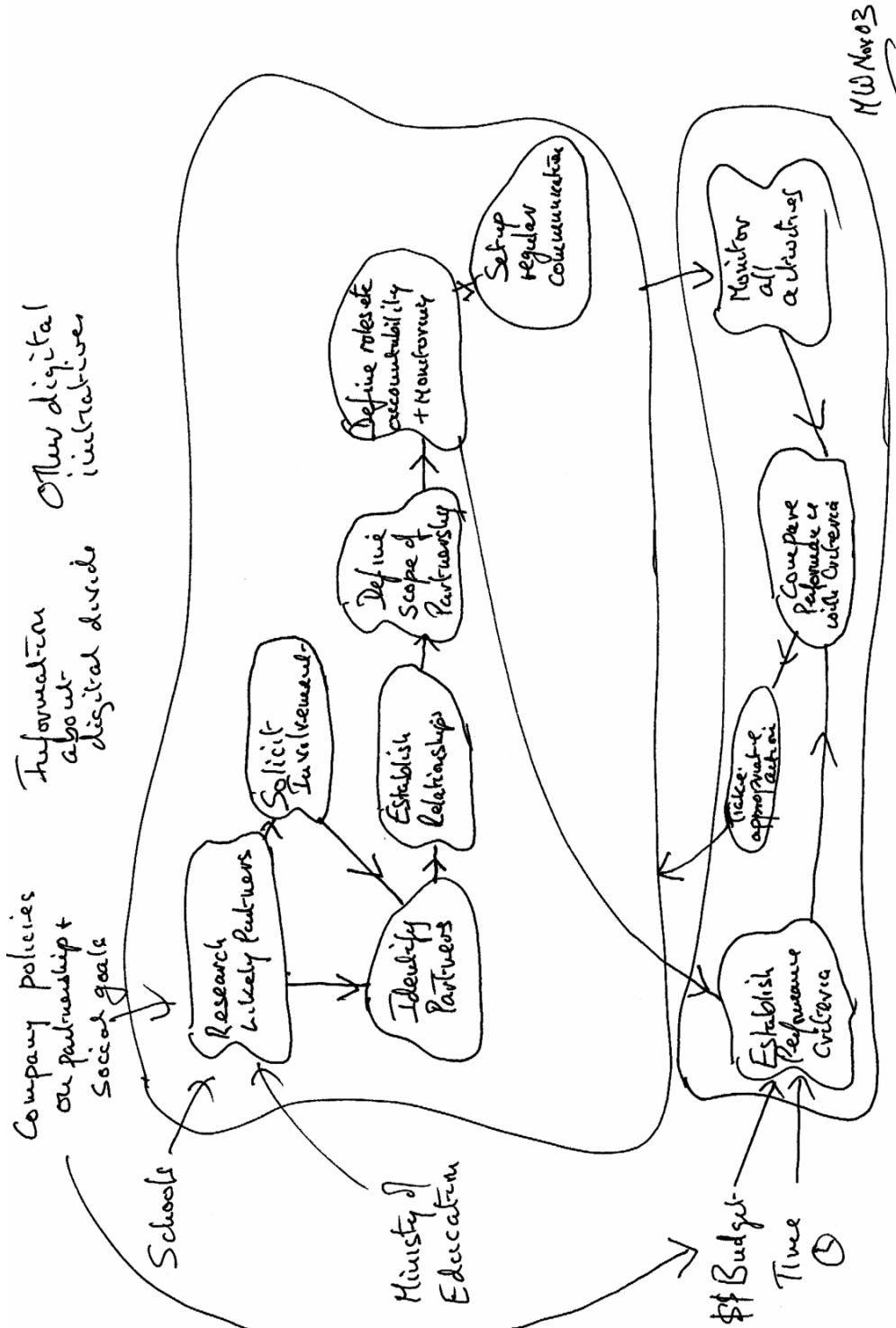
The model was compared with the real world situation using the matrix shown in Table 20.

**Table 19. The Fruitful Partnership System Root Definition**

<p>A system to establish and maintain fruitful partnerships between schools, Ministry and businesses by identifying potential partners, defining the scope of the partnerships, establishing working relationships between the parties, defining roles, responsibilities, accountabilities and monitoring procedures and establishing regular communications and defining the scope and nature of the partnership in order to facilitate the establishment and running of the Generation XP project and to ensure that all partners appreciate each others concerns regarding the project.</p>	
Customers	Schools, businesses MoE
Actors	Schools, businesses, MoE
Transformation	Organisations and individuals ignorant of each others' world views working in isolation from each other and pulling in different directions → A cooperative team of entities aware of each others worlds and issues, working together to create greater ongoing success of the programme
Weltanschauung	It is beneficial to the programme and more efficient for these entities to work in real partnership than in isolation. New Zealand is too small a country for people not to work together
Owners	Schools, BPs, Ministry
Environment	Need for digital projects to succeed if NZ is to be competitive in a digitized world Financial constraints due to small size/budget in NZ. Need for disadvantaged sectors to succeed.



Figure 26. Fruitful Partnership System Conceptual Model



**Table 20. Comparison of the Partnership System with the Real World Situation**

Activity	Exist or not in real situation ?	How was it done?	How it was judged?	Comments
1. Identify Partners	Yes	Certain IT businesses approached Government concerned to remedy perceived shortage of IT skilled people in NZ. Digital Opportunities grew from this. Schools selected by MoE	Were appropriate partners identified? Did they subsequently become involved?	An alternative in future could be direct approach to prospective partners by government. Schools should be approached earlier.
2. Establish Relationships	Yes	At least one meeting at which stakeholders were present	Was a meaningful relationship achieved? Did all parties feel involved in the partnership?	Schools felt 'dumped on' and that there was no true partnership. Business contacts seemed to have no time to pursue links, Maybe role of project manager could emphasise fostering partners' commitment.
3. Define Scope of Partnership	Yes	?		
4. Define Roles, Responsibilities, Accountabilities, Monitoring and Control	Partially	?		Schools mentioned that they did not always know whom to approach to solve problems.
5. Set up Regular Communication between Partners	Minimally	Gisborne schools communicated to some extent through Generation XP coordinator in 2003. Little communication between Auckland schools. Little contact between BPs and schools after start up except for some contact with Computer Press Ltd. Contact from schools to BPs tended to be to get problems with technology sorted out. Very little use of TKI web site for communication between stakeholders after start up	Business partners stated that they would like more regular communication, rather than working from 'no news is good news' basis. Some schools would have appreciated closer contact and more interest from BPs in the project.	Schools felt that BPs generally not interested in communicating. One BP saw the aim of closer involvement as being 'over ambitious'. Schools commented that closer relations with business could inform students about opportunities in the business world. Brief e-newsletters about the progress of the project could keep BPs informed. Visits from BPs to schools 1-2 times per year? Digital Opportunities manager or Generation XP coordinator could facilitate contact.

Activity	Exist or not in real situation ?	How was it done?	How it was judged?	Comments
6. Monitor and Control	No		Does the partnership meet the needs of the partners?	There appeared to be no mechanisms for ensuring that an effective ongoing partnership exists. No criteria existed for this to happen. The nature of the partnership between businesses and schools appeared to have been almost exclusively related to supply and maintenance of infrastructure. It was not clear exactly what benefits the parties would obtain from effective partnership

Future partnerships involving schools, businesses and government would need to be based on mutual benefit and commitment, although Stuart (2004) has suggested that ‘win-win’ partnerships are not sustainable if the benefits sought by each partner are widely different. One way to set up partnerships would be to repeat the situation where businesses approach government, but it is also possible to envisage a situation where government would approach carefully selected business partners. The successes and challenges of this and other Digital Opportunities projects could be cited in such an approach.

The evaluator believes that if possible, carefully selected schools should be approached early in the project and should be brought in to the planning stage. This could increase ownership of the project by schools and foster mutual understanding of schools’ and business’ worlds. A more radical approach which would improve commitment of schools to future projects would be to fund projects conceived by schools themselves. This approach was taken to select projects for involvement in the 2005-2007 round of the Digital Opportunities programme (Education Gazette 2004).

The extent and nature of commitment of all parties to future projects, with appropriate allocation of roles, responsibilities and monitoring procedures could be worked out. The mechanism and frequency of communication could also be settled. It should also be feasible for the Digital Opportunities manager or coordinator to facilitate communication between the partners, possibly by using a web site such as that provided by TKI.

It may be that a partnership such as envisaged in this section may not be viable, because of time commitments and other priorities of the stakeholders, but the evaluator believes the attempt would be worthwhile.

## Summary

1. Most schools did not perceive the project as being a true ongoing partnership between schools, businesses and the Ministry. They felt ‘dumped on’
2. True partnerships would involve ongoing cooperation and communication for the duration of the project
3. Schools and students would benefit from a greater awareness of the business world and its opportunities. Such increased awareness could be an appropriate complement to the actual training. Businesses could get greater exposure and recognition of the social good of their involvement.
4. Communication could be fostered by periodic newsletters reporting progress with the project, and by business representatives visiting schools once or twice a year.
5. The Digital Opportunities Manager or the Generation XP Project Coordinator could facilitate communication

## Glossary of Acronyms

CISCO	A commercial computer networking company which provides interactive training
IC <sup>3</sup>	Internet and Computing Core Certification
ICDL	International Computer Driving Licence
ICT	Information and Communication Technology
IT	Information Technology
KAWM	Kaupapa Ara Whakawhiti Mautaranga –An initiative to use ICT to raise achievement of Maori learners. In 2001, it provided recycled computers and a thin client computer network to Gisborne schools
LCT	Learning Centre Trust
MCP	Microsoft Computer Professional Qualification
MoE	Ministry of Education
MOS	Microsoft Office Specialist Qualification
NCC	National Certificate in Computing
NCEA	National Certificate of Educational Achievement
NQF	National Qualifications Framework
NZQA	New Zealand Qualifications Authority
TIM	Text and Information Management
TKI	Te Kete Ipurangi – The Online Learning Centre
TPK	Te Puni Kokiri – Ministry of Maori Affairs
WOW	World Organisation of Webmasters



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