

Education in Technology for LCTLs: Ngā Tautono Rorohiko

Introduction

The Māori language has been marginalised in the New Zealand education system until very recently. Since the instigation of a compulsory education system policies of assimilation have prevailed, often culminating corporal punishment for those students who spoke in the Māori language. It was not until the 1950s that the Māori language was accepted as a subject in some high schools, and later still, in the late 1970s that Māori was accepted as a medium of instruction in some rural areas. Surveys indicated that the outlook for the Māori language looked bleak. Initiatives began at that time attempt to rectify this situation and to ensure the survival of the Māori language. In this paper we provide a description of the historical and academic context in which courses were developed for supporting Māori language teaching in academic disciplines. Lessons learned as variant of the courses were developed and taught are identified, The global context of LCTLs in relation to information technology is briefly considered. Suggestions are made for further work.

A Cultural Renaissance

In 1982 the first *kohanga reo* was opened in Wainuiomata (Wellington) for Māori pre-school children. The kohanga reo movement proved an instant success and spread rapidly across New Zealand. In 1990, the number of children attending a kohanga reo was 1,018, while in 1995 this figure had increased to 14,236. The figures for 1995 indicated that almost half of all Māori children in early childhood education attend a Kohanga reo. At this time the aim was to increase this number to as high as 75% by the year 1998.

Initiatives were also established in the form of *bilingual units* and *kura kaupapa Māori*. In 1978 the first bilingual unit was set-up in Ruatoki, a rural area where a significant proportion of the Māori community still used Māori as an everyday language. In 1988 the first kura kaupapa, Hoani Waititi, was set up in Waipereira (in Auckland). However, there are not yet significant student numbers, who are being taught in the medium of Māori, in the primary and secondary schools. The 1995 figures show a total of 25,248 school children receiving some form of Māori language immersion, with only 8,326 receiving a Level I immersion. This number is very low when considered in light of the fact that it includes a 13 year teaching span (J1-J2, Standards 1-4, Forms 1-7). It is predicted that of the 3500 or so children completing Kohanga reo education in 1995, less than 30% will be able to continue their education in some form of immersion program.

Despite the obvious bottle neck in immersion programs at the primary and secondary schooling levels, pressure has also been placed on tertiary institutions to assist in the struggle for survival of the Māori language. Te Whare Wānanga o Raukawa was established in 1981 It is a tertiary institution, at Otaki near Wellington, where all courses are taught in the medium of Māori. Other universities through out the country increased the number of Māori language papers that were taught, to such a level that in 1995, of students at a tertiary institute 1,811 listed Māori as their main subject. The University of Waikato took the bold step of introducing a program where a complete degree was undertaken in the medium of Māori. This was called, *Te Tohu Paetahi*.

Te Tohu Paetahi

In 1990 a proposal was advanced for a program in Māori within the Bachelor of Arts Degree called Te Tohu Paetahi in which the medium of instruction was to be the Māori Language. While the Māori Department has gained a reputation throughout Māoridom as having had some success, the staff were not satisfied that the graduates majoring in Māori were sufficiently fluent in the language.

The survival of Māori language as a community language, used in a wide range of situations, is in a precarious state. In the 1970s, a major survey of the country was conducted by Dr Richard Benton from the New Zealand Council of Educational Research to determine who spoke Māori in New Zealand. His conclusion at that time was that there were about 70,000 people able to speak Māori conversationally and another 115,000 able to understand the language with ease. But while these totals were impressive, he pointed out that these totals were likely to decrease markedly in the next two decades because 3870 of Māori speakers were over the age of 45 years. Te Taura Whiri i te Reo Māori estimates that the number of fluent speakers is now only 30,000 and will continue to decline unless positive measures are taken. It is important that the University of Waikato at the geographical heart of Māori population in New Zealand takes a leading role in promoting the use of Māori by producing graduates of quality who are fluent speakers of the language.

It has been estimated that considerably more than 2,000 hours tuition is required for adults to become sufficiently fluent to cope with learning in a second language. It is not surprising then that the Māori Department was dissatisfied with the standard being reached by its graduates. With less than 110 hours tuition a year, the amount of time being devoted to learning Māori falls far short of the minimum required. This new development was not intended to replace existing programs but was aimed at overcoming the limitations of the current courses and degree structures by having intensive Māori language classes from 9 a.m. to 3 p.m. Monday to Friday, throughout the academic teaching year (24 weeks).

The program is the normal BA program, with the exception that in the first year the students would study all eight Māori language papers that would normally take four years, and that in the second and third years the medium of instruction for papers both taught by the Māori Department and other departments will continue to be Māori.

It was planned that the first intake for this new degree will be limited to a maximum of 25 students. In subsequent years more classes of 25 will be introduced as demand requires. This will ensure that enrolments for non-Māori Department papers, taught through the medium of Māori, will be of an economical number.

Effective intensive second language learning is demanding on teaching staff. Because the group will be taught from 9 a.m. to 3 p.m. each weekday for the academic year extra staff in the Māori Department were required to ensure the program's momentum was maintained. Appointments in other key subjects of staff who are able to teach particular papers through the medium of Māori were made early in 1991 and subsequent years to allow sufficient time for the preparation of texts for the courses to be taught in Māori the following year. Full advantage was taken of current knowledge of second language teaching methods in immersion type education within a Māori cultural setting.

Because Māori has been excluded from the education system since the 1860s, the lexicon to cope with the specialised language required in many academic subjects had not been developed. To use Māori as the teaching medium forced this development to take place in the way that it has in other languages. The Computer Science Department met this challenge by offering tutorials taught through the medium of Māori. This development was seen in the School of Computing and Mathematical Sciences as being important in giving the students skills for occupations of benefit to the Māori people. Staff capable of teaching in the course were actively sought and employed. Apprehensions about the difficulties of teaching computer science at tertiary level in Māori were overcome by intensive work over two years in translating existing course materials. The translation process is ongoing largely because computer science as a discipline is changing very rapidly and courses must change to keep pace with the changes in the discipline.

0657.113 Computer Applications 1990-94

In the early 1990s the Computer Science Department rewrote the introductory course on personal computers, assigning it a new course number, 0657.123, and calling it Computer Applications. The objectives of the course were listed as:

The course is designed to introduce students to the basic ideas and concepts relating to the use of personal computers and to allow students to achieve familiarity with computer software and hardware through exposure to a variety of machine environments and a range of commonly available software packages in a series of practical sessions. In this way students should gain practical experience in problem solving and information processing using computers.vi

This course, along with many Computer Science courses consisted of three components, lectures, tutorials, and practical work. Each week the student was required to attend one lecture, one tutorial, and to spend two hours in the computer laboratory working on the laboratory exercises. The lectures and tutorials gave introductory information on personal computers and computing. There were 18 practical exercises and four assignments. In general the practical exercises covered introductory work along with Word-processing, Spreadsheet and Database exercises.

There were two computer laboratories made available to students with 40 computers in each. One lab consisted of IBM compatible PC's, the other Macintosh Apple computers. The students were required to do approximately half of the work in each lab so that they would have experience on the two different computer architecture.

There were two manuals that were provided to the students. A Practical manual and a Work Manual. The practical manual was instructions on how to use Microsoft-Works which included practical exercises on Word Processor, Spreadsheet and Database, 11 out of the 18 practical exercises. The work manual was made up of three main sections;

- an introduction and general overview of the course
- tutorials: the assigned reading, background material, and the activities which will take place during the tutorial period.
- practical exercises: instructions on how to load MS-WORKS, and begin at the correct place, the remaining five practical exercises to be completed, along with assigned reading, and review pages to complete.

The grading for the course consisted of 1/3 from the practical component and 2/3 from the final external exam. The practical component required the completion of at least 16 of the 18 practical exercises, four assignments and one multi-choice test:

Internal Assessment

Assignment I word-processing 7%

Assignment II Spreadsheets 7%

Assignment III Database 7%

Assignment IV Integrated 7%

Multi-choice Test 5%

33%

External Exam 67%

100%

0657.113 Ngā Tautono Rorohiko 1993

In the University of Waikato's summer break of 1992/1993 the School of Computing and Mathematical Sciences paid two Masters students to translate the work manual of the Introduction to Computer Science Course, 0675.113, from English into Māori. This process was found to be a very difficult and time consuming task. The translators were in fact breaking new ground as most of the material had never previously been written in the Māori language. Often a phrase, a concept or even a simple word would require considerable discussion before a suitable translation was decided. The translators found that they were in fact dealing with three languages, English, Māori, and the computer language, and thus required a reasonably in-depth knowledge of each. For example to literally translate random access memory (RAM) would be misleading as there are many types of memory that are accessed randomly (that is, not accessed sequentially) but these memories are not referred to as RAM.

The foreword explains some of the difficulties;

Kua hāngai tonu te pukapuka nei ki te karaehe 0657.113, he pukapuka whakamāori i te pukapuka Pākehā. Otirā, i whakamātauria e mātou te whakauru i ngā tauira Māori, ngā whakaaro Māori me ngā kupu Māori tūturu. Ehara tēnei i te mea ngāwari, me pēwhea rawa te whakamāori i te operating system, i te data flow diagram, i te artificial intelligence rānei?

Ko te whāinga tuatahi o te pukapuka nei, he āwhina i ngā ākonga o te karaehe 0657.113 e ako ana i roto i te reo rangatira ahakoa nō te rōpū o Te Tohu Paetahi, nō whea rānei. Nō reira, he āhua ngāwari te reo, ko ētahi kupu he kupu tāhae, ā, kei muri i te pukapuka te rārangi o ngā kupu hou. Nā te āhuetanga o te mahi nei he maha ngā kupu hou: kia kaua taua āhuetanga e patu i te ākonga.

This workbook is written for the class 0657.113, a translation of the English version. We have tried to include Māori examples, Māori concepts and traditional words where possible. However this is not an easy task, how can one simply translate words like operating system, data flow diagram, and artificial intelligence into Māori?

The main aim of this book is to assist students in the Māori stream of 0657.113 whether they are in Te Tohu Paetahi or not. Therefore the language is not complex, some of the words used are transliterations, and there is a word list of new words supplied. It is hoped that the number of new words is not a hindrance to the student.

The manual was specifically written as a workbook for the Māori stream of the Computer Applications class. However it was hoped in time and with revision that the manual could eventually stand as a computer reference in the Māori language.

In the year 1993 there were initially 19 students (3 withdrew) enrolled in the 'Māori stream', out of a total number of 670. It must be remembered at this stage there was still a large amount of the course taught in English. The lectures were still conducted in English (no Māori lecturer being available at that time), the practical manual was in English (this included 13 of the 18 practical exercises) and the computer interface was in English. The Māori component consisted of the Work Manual, 5 of the 18 practical exercises, the tutorials and the assignments. That worked out to be slightly less than 50 %, but at least it was a beginning. The final exam was provided to those students of the Māori stream in both the English and Māori language.

What did students want?

Students on the 1993 course, when questioned at the completion of the course, listed three main objectives for enrolling in the course. Firstly to gain some kind of computer experience in a world where some computer knowledge is becoming mandatory. Secondly because of a desire to use the Māori language in all avenues possible, and to show that the Māori language is not a language that should be relegated to the stone age. Thirdly, it is a requirement of the Tohu Paetahi degree structure that subjects outside the Māori department must also be taken in the Māori language, despite having a percentage of Māori lower than 100%.

The main problems that were encountered in the first year by the students was the new technical jargon, the large amount of Māori words with new meanings that were used and the constant switching of languages (from an English lecture, to a Māori tutorial, to often Māori practical instructions, with an English response from the computer). There were occasional difficulties with timetable clashes. Another constant complaint about the course was the large amount of practical work for only the small amount of reward (33%) at the end. However, this was a fact of the course structure and was not inherent to the Māori stream.

The students appreciated the attempts that were being undertaken to provide environment there were conducive for them as Māori to learn. Agreement was also reached that despite the difficulties, the objectives of the course were being met. Although not considered to be a very Māori method for course appraisal, the average final grade for students in the Māori stream was virtually the same for students enrolled in the English stream (54.9% as opposed to 56.9% , both being a C+ grade).

Inevitably, when the first course was completed there was nowhere could students go to carry on computer studies in the Māori language.

0657.113 Ngā Tautono Rorohiko 1994

The 1993 course was retaught in 1994, with the structure and grading of the course remaining constant. However some changes were made in some of the practical work and the tutorial order and content was upgraded. These changes consequently caused the work manual to be revised, in both the English and Māori versions. It was also found that some explanations in Māori were difficult to comprehend, so these were also re-written. The list of new words (in Māori) was slightly increased (from 307 used in 1993 to 334) to cover the additional material, however in tutorials the use of new words was reduced as much as possible as it tended to confuse the students.

In 1994, there were initially 29 students enrolled for the Māori stream of the 0657.113 course (3 withdrew). Again the average final grade for students in the Māori stream was virtually the same for students enrolled in the English stream (54.8% as opposed to 53.7%).

The main incentives for students enrolling in this course remained constant, that being to learn computer skills, as another avenue of use of the Māori language, and because the Tohu Paetahi degree required it. The main problems were still the amount of language switching, the large number of new words and the weighting of the final exam as opposed to the course work. However, due to the fact that most of the students were very strong in their desire for the Māori language learning experiences, the difficulties were worked through and in almost all cases course objectives were met.

0657.103A Introduction to Computing. 0657.104B Introduction to Computer Science. 0657.123A, B & S The Computer Experience 1995

In 1995, due to semesterisation, the Computer Science Dept. decided to alter its delivery of first level computer science courses. The Computer Applications paper (0657.113) was combined with a Computer Programming course (0657.106) and then the combined papers were divided into an A semester paper (0657.103A) and a B semester paper (0657.104B).

Students who were enrolling for a degree within the School of Mathematical and Computer Science were expected to enroll in the papers 0657.103A and 0657.104B. Students who wished to enroll in a computer paper for the experience only were expected to enroll in the paper 0657.123, which is a single semester paper only, 0657.123A being the first semester, 0657.123B being the second semester and 0657.123S being the summer semester option.

0657.103A He Kawenga Rorohiko 1995

The major problem with preparing a Māori stream of a computer course for 1995 was the time factor. There were perhaps little more than two months for the translator who actually had a lot of other tasks to do at the same time. With this in mind, and the thought also that maybe if an A semester paper can be translated into Māori, maybe in time the subsequent B semester paper can also be translated, it was decided to translate the paper 0657.103A, Introduction to Computing, into Māori.

The introduction of the translated manual mentions the following points...

...I te tuatahi ko te whakaaro kia whakahou noa i te pukapuka "Ngā Tautono Rorohiko" kia puta ai ko te "He Kawenga Rorohiko". I te kitenga o te nui nō ngā hē i roto, me te maha o ngā kupu hou e whakararu ana te ākongā hou ka whakarerekē ngā whakaaro. Ka waiho te pukapuka "Ngā Tautono Rorohiko" ki tētehi taha, ka whānau mai tēnei pukapuka mahi hou, ko te "He Kawenga Rorohiko".

Kāore anō kia oti te pukapuka nei, "He Kawenga Rorohiko". Kua whakamāoritia ngā whakamāramatanga i te tīmatanga o te pukapuka me ngā akoranga, engari ko ngā ngohe me ngā āpitihianga kei te toe. Ko te tūmanaako ka whai wā ki te whakamāori i ngā wāhanga kei te toe i roto i ngā mahi o te tau 1995 nei.

It was initially envisaged that the Manual "He Kawenga Rorohiko" would be written from a revision of the manual "Ngā Tautono Rorohiko". However due to the difficulties still with that manual including the large amount of new words, it was decided to leave it to one side and write the new manual, "He Kawenga Rorohiko", from scratch.

This manual has not yet be completed. The Introduction and the Tutorials have been translated into Māori however the practicals and the appendices have not as yet been translated...It is hoped that there will be time to complete the untranslated sections throughout the year of 1995.

The course required up to 12 hours work per week of which the students could only expect to have maybe a quarter conducted in the Māori language. Consequently only 9 students initially enrolled. Of that figure 3 officially withdrew, 3 did not complete the course and 3 passed (with a 68.8% average). Clearly the Māori stream structured in this way was not suitable.

Computer knowledge was still being disseminated, and a smaller class size allowed for a closer teacher/student ratio however course objectives were not generally being met. In reviewing the course, there were three main problems that students identified. The percentage of Māori language was low, the interpretation of the various computer jargon was difficult, and being a single semester course the information was dispersed too quickly.

Rather than complete the translation of the "*He Kawenga Rorohiko*" manual it was decided to instead switch to the Computer Experience course as a source for a computer stream in Māori.

0657.123 He Tomokanga ki te Ao Rorohiko 1996

In the summer of 1995/1996 two students worked on the translation of practical assignments for the course 0657.123 He Tomokanga ki te Ao Rorohiko. Almost five were completed, one an introductory practical exercise, two on Word Processing, and two on Desk Top Publishing. At the time of writing this paper, a further four more practical exercises are being translated, this allowing the students who are enrolled on the course to complete it.

The course is different to the one taught in English in a number of ways. It is taught over the whole year, thus allowing the students on the Māori stream a little more time to complete the required work. This strategy was agreed on because most students of the Māori stream are also students of the Māori language, they tend to take longer to understand what the computer science lesson is all about. The lectures are in Māori, are taught by a Māori lecturer, and in general will be from a Māori perspective. However, there is not the same amount of choice for students in the Māori stream as the practical exercises that are available are only those that have been translated into Māori.

Currently, in 1996, there are 34 enrolments for the Māori stream. We are virtually halfway through the course and at this stage it looks as if a high percentage will pass the course very well.

The students were briefly questioned about the course with the following major points emerging. Some students still had occasional difficulties with the course information, terminology and pace. Some even suggested that the lecturer preview some of the practical work on overhead, or on a large screen that students could follow. There was a strong support of the course due to the fact that it was in Māori, thus was supporting the Māori language. The students mentioned that the course is beneficial to teachers, who will need this information in Māori when arriving in total immersion situations. It will also be needed for the younger generation who will be arriving with a stronger Māori language base and it proves to the world that the Māori language can survive in new environments. Those students who are learning the language are also given another environment where they can further consolidate what they have learnt in a language course.

The global context for LCTLs and Information Technology

The scale of the global problem of western hegemony in information technology is such that very special efforts supported by special pleading will be required to ensure the survival of LCTLs. We make no apology for our commitment to and efforts in promoting culturally appropriate use of information technology. However, we are aware that communication between cultures is becoming increasingly important as western cultural dominance recedes and minorities are recognised. Recent research suggests that the functionality embodied in an interface to a computer system can be distanced from the messages used by people to communicate with the software and hardware.

Conclusions

Placing an indigenous student into environment that is totally foreign to them, isolating them from other students of a similar background, teaching them using a pedagogy based in a different culture and then expecting them to pass well is unrealistic, no matter what subject is being taught.

However, this situation can be redressed by providing the course in a heritage language. Consequently the students of a similar background are brought together and learn in a situation that is more communal than individual. The students feel more at ease learning in their own language because the environment ceases to be foreign. The initial barrier or fear of the subject, as often exists with a new technology, is greatly reduced.

The past experiences from courses taught in Māori by the Computer Science Department, show that big efforts must be made to keep as much content as possible in the native language. Care must also

be taken in the translation work to ensure that sentences from another language are not simply clothed in the traditional metaphoric language. Clarity and simplicity must be to the forefront.

Problems will occur when students are still learning their heritage language in that they may not fully understand what is being said. Very few complaints will surface though, as normally those students so strongly desire their heritage language that they are prepared to work that extra amount harder, realising the benefits to them will be twofold.

There are many benefits of providing a New Technologies course in a heritage language. Students are given an opportunity that is unique and very much appreciated. A whole new world is opened up to a group people that may never have been able to access it before. To ensure the survival of a heritage language it is absolutely essential that it expand to be able to express new technical concepts. The Computer Science department at the University of Waikato has shown that this type of development is very possible and very beneficial. However providing one computer science paper in a heritage language is just a beginning, it is envisaged in time that maybe there are two papers, then four, and then maybe whole subjects.

There is also that the communication process between cultures be facilitated. But, we see this particular problem as being of much less significance than the survival of particular languages and cultures. New techniques in the internationalisation of application programs should serve to ensure LCTLs survive and enhance communication between cultures.

ACKNOWLEDGMENTS

This development was made possible through the foresight and support of the Dean of Computing and Mathematical Sciences, Professor Ian Graham, Kia ora Ian.

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