Report:

Some Outcomes of Flexible Learning At the University of Otago 1996-98

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WHAT IS FLEXIBLE LEARNING? In 1998, the University of Otago adopted a definition of flexible learning that focused on learning outcomes rather than on teaching inputs:

> Flexible learning at Otago University is an approach to education that allows for the adoption of a range of learning strategies in a variety of learning environments to cater for differences in learning styles, learning interests and needs, and for variations in learning opportunities. (University of Otago, Flexible Learning Strategic Plan, 1998.)

This definition is reflected in the University's Teaching and Learning Plan (1996), and the Strategic Directions to 2000 document. Both of these recognise the importance of adopting teaching strategies that are student centred and which allow for greater student flexibility in learning through variations in the time, place and pace of study. The flexible learning approach is incorporated into a number of initiatives taken across the University between 1996 and 1998, some of which are described in this report.

Flexible learning is not to be confused with flexible delivery. The latter is a process for producing and delivering customised learning packages designed to maximise learners' access to measurable learning outcomes. It is distinguished from flexible learning because it deals only with the delivery of learning, not its philosophical construction.

What is the difference between open learning and flexible learning? Rumble writes of *open learning:* "It is an imprecise phrase describing any form of educational provision in which the restrictions placed on students are minimised and in which decisions about learning are taken by learners themselves" (Rumble, 1997, p. 4). Of *flexible learning* he says: "[it] is sometimes used more or less synonymously with open learning and also has no precise definition" (Rumble, 1997: p. 4). He compares distance education with open learning and proposes that: "Reflection suggests distance education is a method of education whereas open learning espouses a philosophy of education" (Rumble, 1997, p. 5). He notes that distance education is contrasted with those other forms of education in classrooms, lecture halls, laboratories or study groups that are based on contiguity between student and teacher. These methods reflect the paradigmatic nature of the school and its classrooms in peoples' experience of education.

Race discusses open learning, distance learning and flexible learning. He describes the circumstances in which they might occur: "Open learning can certainly be done at a distance"; and "open learning can happen in a crowded lecture room" (Race, 1995, p.22). He claims that open learning in its broadest sense and distance learning, as a sub-set of open learning, involve giving learners a degree of choice and control. In other words they introduce elements of flexibility into the learning process.

Wade broadly defines flexible learning as "an approach to university education which provides students with an opportunity to take greater responsibility for their learning and to be engaged in learning activities and opportunities that meet their own individual needs" (Wade et al, 1994, p.12). Wade regards open learning as a "term used to describe courses flexibly designed to meet individual requirements". She quotes Lewis and Spencer: "It is often applied to provision which tries to remove barriers that prevent attendance at more traditional courses, but it also suggests a philosophy" (Wade et al, 1994, p.12).

Rowntree, after reviewing a number of alternative definitions of open and distance learning, concludes that open learning is two different things:

- a philosophy – a set of beliefs about teaching and learning, and
- a method – a set of techniques for teaching and learning (Rowntree, 1992, p. 13).

He writes: "Much of the confusion arises because people don't always realise that philosophy can be practised without using the method. And, more commonly, the method can be applied without the philosophy" (Rowntree, 1992, p.13).

The arguments for efficiency and effectiveness in education can lead to more open and flexible educational provision. They are, however, dependent on the perspectives of educational providers who constitute only part of the equation. Boot and Hodgson claim:

> A general feature of discussions in open learning at present is that it is predominantly seen from the perspective of the provider as though openness were solely a characteristic of formal provision... They seem to concentrate on the "open" part and leave the "learning" part in the background, together with assumptions or beliefs about what it is and how it takes place" (Hodgson, 1987, p.5).

They go on to make the point that "we are aware of some tendency to talk of open learning as though it were a recent innovation in educational thinking. One only has to look at the work of John Dewey and his followers to see this is not true ... for them, the nature of learning was central" (Hodgson, 1987, p. 6).

Otago University's approach to and implementation of some flexible learning programmes will now be described.

Integrating Flexible Learning at Otago University

Initially, the approach to integrate flexible learning strategies into workplace practices at the University of Otago commenced through the University's senior management. This sought to generate support for, examples of, and interest in flexible learning that would diffuse ideas for innovation throughout the whole teaching and learning environment of the University. The four Assistant Vice-Chancellors (Humanities, Health Sciences, Commerce and Sciences) nominated one paper each they thought suitable for conversion to a flexible learning approach. They chose papers based on student numbers and on whether they had or might have difficulties in their current delivery. Funding came from the Vice-Chancellor and from divisional budgets. Of the papers discussed here, four were large class first year courses and one was a second year course that caused difficulties for students.

Following these nominations, staff employed in the Flexible Learning Section of the Higher Education Development Centre (HEDC) contacted the relevant Heads of Departments and academic staff to begin the conversion of their papers to more flexible delivery. The academic staff members involved received documents outlining the main characteristics of flexible learning, and ideas for the processes involved in developing papers in this mode. These documents explained the various roles the supporting staff would have, and stressed the need for effective project management. The Head of the Flexible Learning Section

developed project teams for each paper, consisting of the coordinator, other academics involved, a project manager, an educational advisor, and later other staff members who would be involved in the production of materials (Flexible Learning Section, internal document, 7 October 1996).

Staff from the Flexible Learning Section began the process of conversion by working with the project teams to establish learning objectives for each course in accordance with the University's Teaching and Learning Plan (1996). This required the academic staff to rethink their courses in terms of the knowledge, skills, attitudes, understanding, ethical and social implications of the subject, and the life-long learning skills their students could achieve. Having set these objectives, the project team proceeded to design and develop teaching strategies to suit these needs. This included the creation of written materials, lecture strategies, computer-based instruction, small group activities, and assessment strategies. Teaching and learning strategies were also chosen based on the availability of time and resources as well as their suitability to the chosen objectives.

RESEARCH QUESTION The development of any new teaching or learning strategy attracts the inevitable question, "Has it made a difference?" While sounding innocuous, the question is very complex because of the range of individual differences among students and because of the variety of teaching strategies that may be used. Establishing a 'control' and 'experimental' group in such circumstances would be ethically and educationally questionable. Therefore a more appropriate question to ask in these circumstances is: "Have student attitudes towards the teaching of this course changed over time?"

In order to answer this question, a survey was designed which asked a range of questions to which students responded using a five point Likert scale (5 = strongly agree, 4 = agree, 3 = undecided, 2 = disagree, 1 = strongly disagree). All students participating in papers where flexible learning approaches were adopted, were given the questionnaire to complete both before they undertook the course and after they completed the course using flexible learning strategies. The same questions were asked each time. Thus a pre- and post- test method was used and the scores were subjected to a Chi Square analysis to test for significant differences. This enabled the research question to be answered. A research assistant monitored the progress of the projects, including measuring student learning outcomes, and was responsible for administering the tests. In addition staff opinion was sought about changes in student performance compared to previous years in the same course.

The results from the five papers that were part of this initiative will now be discussed.

HISTORY 102 History 102, The Twentieth-Century World, was a first semester paper taught by four academic staff in the History Department. Previously, each staff member taught one section of the course covering his or her area of interest (United States history, Asian history, Russian history, and European history). The course consisted of three lectures and one small group tutorial each week. Approximately 120 students enrolled in this course each year. The resources available to students were several computer-assisted learning programmes (one staff member had placed his lecture notes on a hypercard stack), lecture handouts, and the textbook.

Staff in the Flexible Learning Section worked with the coordinator to help establish a set of learning objectives for this paper expressed in terms of the University Teaching and Learning Plan (1996). Based on the learning outcomes in the Plan, redeveloping the course in a flexible learning approach involved the lecturers redesigning not only the course structure, but also each lecture. The team decided to combine their areas of interest within each lecture to give the students a more coherent, integrated introduction to world history. The course was redesigned to include

two lectures, and one tutorial a week. They reserved the third lecture time for showing videos to interested students.

The resources created by the team for this course were:

- a comprehensive, interactive coursebook
- an internet website
- an email discussion list
- further computer-assisted learning (CAL) programmes
- lecture activities
- videos for use in lecture and student's own time
- interactive tutorial exercises
- suitable assessment strategies.

Initial work on this project commenced in August 1997 with academic staff preparing written notes for the coursebook. This necessitated not only the staff writing this material, but holding weekly meetings to ensure that each member had a good understanding of each unit of work being developed by the others. The HEDC (Higher Education Development Centre) instructional designer worked with staff to ensure clarity of content and consistency of format. The instructional designer also desktop published the final and agreed text to create an interactive, student-centred coursebook.

As the writing progressed, the course coordinator identified video sequences that would illustrate the historical detail in the unit themes. The Educational Technology Support Services (ETSS) staff acquired rights to use the video sequences and assembled these in the same order as the units. Other ETSS staff created a suitable web page from which students could access administrative information, electronic handouts, and the hypercard stacks. Staff completed the project in February 1998 well in advance of the time the students needed the materials.

RESULTS FROM THE STUDENT SURVEY Questions sought information on student expectations of enjoyment, stimulation, increased knowledge, development of specialised skills, communication skills, exploration of topics in depth, understanding wider implications of the themes, developing computer skills, general research skills and help in passing the final examination. The questions also sought information about students' views on the teaching strategies used. In addition to the resources listed above, tutorials, textbooks, class discussions, informal discussions, computer-assisted learning programmes; studying in the student's own time, assignment sheets, worksheets, reading, regular assessment, and group learning were included.

The data showed no significant differences between pre- and post-test groups for the traditional teaching methods. In the new categories for the flexible learning strategies, students responded well to the coursebooks, 83% rating them either highly effective or effective. In fact students responded that the coursebook, which allowed them to access materials easily, and the videos, were the most effective teaching tools introduced into History 102 as part of the flexible learning package. They responded negatively to the textbook, with only 33% rating it effective or highly effective. However, the course did improve students' skills in using computers.

One important finding was that students' responses to the range of teaching strategies did not quite live up to their expectations displayed at the start of the course. This may be due to the fact that these were first year students not accustomed to university work. It is noteworthy that those students and teachers who were familiar with the coursebook/video technology, did not display comfort with the emerging electronic technologies.

An analysis of these results, based on the null hypothesis that the flexible learning strategies would have no effect on whether student expectations were met, shows that the null hypothesis is disproved and that this approach to teaching History 102 had made a difference.

SURVEYING 111 The Department of Surveying in the Division of Sciences sought assistance from the Flexible Learning Section to devise a coursebook for students and to redesign the learning objectives and teaching strategies of Surveying 111. Staff in Flexible Learning prepared pre-course and post-course questionnaires. Similar to those of History 102, they sought general information on expectations, outcomes, and preferred teaching strategy.

This paper was well suited to flexible development because it needed updating and because surveyors identified a large number of surveying technicians working in the profession who would benefit by access to such a paper, even if not in degree structured study.

On this basis, the Flexible Learning staff developed a project plan, made linkages to the University Teaching and Learning Plan and helped redevelop a curriculum scope and sequence chart to cover all the required topic areas.

RESULTS OF STUDENT SURVEY An analysis of data about student expectations demonstrates that the null hypothesis proved to be false. However, while the strategies did make a difference, there were issues arising from the data. It would appear that the course substantially increased students' interest in surveying. While it did not enhance students' computing skills as was expected, it did develop their skills in group work, an important element in the professional development of surveyors. A closer analysis of the teaching strategies used in Surveying 111 showed that students expected tutorials and practicals to be of greatest benefit. After the course they reported that practicals and assignments helped them the most. Important among the teaching strategies in Surveying was the implementation of a coursebook. The Department of Surveying has made its own further evaluations of the programme and concluded that it can be taught in part off site and supplemented with summer school studies for surveying technicians.

ENGLISH 121: THE CHAUCER MODULE An area of concern at the University over a number of years had been English literature and writing skills of first year students. English 121 is the introductory paper for students doing English Literature. It commences with an introduction to Chaucer's *Canterbury Tales* which had been of some concern because of its difficulty. After discussions with the Head of Department and staff of the Flexible Learning Section and the Educational Technology Support Services it was decided to work on the Chaucer module to improve its accessibility and its presentation. A CD-ROM would be produced for this purpose.

The CD-ROM incorporated text, music, reading and pictures. Difficult sections of the text were linked to a glossary of terms. In this way, students could read the text, hear someone reading it, see the relevant pictures and link to the glossary that explained both meaning and pronunciation. Flexible Learning and academic staff devised the learning package and ETSS staff developed the CAL package. Students could access the CD-ROM from any of the University's computer laboratories. However, it could not be borrowed from the library.

RESULTS OF STUDENT SURVEY At the conclusion of studying this unit, students were surveyed about the effectiveness of the CD-ROM programme. Of the 174 respondents, while all had attended the lectures, only 64 (37%) had used the CD-ROM. Among those who used the CD-ROM, 39% found it most useful for exploring meaning and translation of words, and 36% found that hearing the words was most beneficial. Sixty percent of the students believed that the CD-ROM could have explored the characterisation and text in more depth or would have liked to see mastery testing built into the programme. Some students found the disc difficult to access in the computer laboratories and this proved to be because of lack of experience with the systems.

Although only one third of the students in the English 121 class used the CD-ROM, they reported satisfaction with it. Those reporting dissatisfaction did so on the basis of technical aspects such as access or because they felt that the programme did not go far enough for them. The Chaucer project demonstrated clearly that with first year Humanities students at Otago, there is a significant gap between those who are computer literate and those who are not. Only one third of students appeared to be familiar with operating computers at the basic level required for operating a CD-ROM. However, an alternative explanation may be that because there was no formal assessment attached to the CD-ROM component of the course, students chose not to use it.

As a result of the work done in this programme, the English staff have decided to convert other elements of the Chaucer programme into a CD-ROM format.

BIOCHEMISTRY 111 The University of Otago made a critical decision about admission to its prestigious Health Sciences programmes in 1996. Previously, the University accepted students with passes in Biochemistry from any New Zealand University. Biochemistry was not offered in the first year previously nor were students expected to take it at other institutions in order to be admitted to the health professional schools (Medicine, Dentistry, Pharmacy, Physiotherapy). Students could be accepted to professional health schools after completing their entire first year elsewhere, but in 1998 this changed so that any student wanting to do a professional health degree at Otago must have completed the first year at Otago, hence first year biochemistry became quite specialised.

Anticipated enrolment exceeded 1400, causing major problems for staffing, timetabling and for teaching strategies. The actual enrolment exceeded 950. The laboratory system needed a major overhaul to cope with these numbers. Because the medical school, for example, had its own limitations on entry at the second year level, there would be a large number of students who had done well in Biochemistry with an intention to do Medicine, but who could not gain entry. The University expected these students to redirect into Sciences or to the other Health Sciences, so the first year papers had to be well taught in order to retain these students in the University.

For this course, it was decided that the project team needed to include a laboratory coordinator, coursebook developer and a web page designer who would be employed during 1997 to help prepare the laboratory manuals, coursebook and website. A similar arrangement had existed in the Department of Zoology in the previous two years and its success gave confidence to this project.

Once the learning objectives, teaching strategies and assessment strategies had been agreed, funds were allocated to redesign and re-equip the teaching laboratories. People were hired to design, collate and produce the coursebook; to design the laboratory sessions and the laboratory book; and to design a website for student access. The Flexible Learning Section provided templates for the laboratory and coursebooks and provided assistance in instructional design for the laboratory sessions.

This department had its own evaluation instruments so did not use those available from the HEDC. However, the format of the survey was similar to others used by the HEDC.

RESULTS FROM THE STUDENT SURVEY In general, the students found that the course had been valuable, that it required a considerable amount of work, and that it was quite difficult. For teaching, the students found that the lectures were effective, and that the laboratory supervisors and demonstrators were very effective. Of the course materials, students said they were very useful but that the textbook was only just useful. The

laboratory manual was considered to be very good.

The problem lay with the website. Only 16% of students tried to use the site and CAL programmes. An exploration of this problem revealed that the design requirements exceeded computer capacity and that this led to frequent 'crashing'. Naturally this dissuaded students from using it. Technical experts from Information Technology Services later adjusted the programme to run on its designated servers. Apart from this, the BIOC 111 course was well received by students in all its aspects. In particular, the success of the lecture booklets, the laboratory manual and the laboratory sessions, into which flexible learning had a major input, demonstrates that flexible teaching strategies and practices are accepted and valued by students.

MARKETING 233 Lecturers in the Department of Marketing had been teaching a paper, divided into parts, about pricing and distribution theory and practice. Students reported the subject to be difficult. The academic staff decided to seek the Flexible Learning Section's support to make the paper both more flexible and to make it problem based. Impetus was provided in late 1996 by a visit from Professor Hans Kaspar, who was an expert in problem-based learning in marketing, from the University of Limberg at Maastricht. The Flexible Learning Section provided assistance with designing the course objectives, assessment system and with identifying, clarifying and setting the problems. The staff involved also devoted considerable time to discussing and selecting appropriate teaching strategies for the small group work problem based learning inevitably involves.

RESULTS FROM THE STUDENT SURVEY An analysis of student results at the end of the year shows a strong positive skew. The academics teaching the course and tutors involved in taking the problem based learning sessions reported that despite students' difficulties they produced better work than any previous cohorts.

The students found this paper difficult, as had their predecessors. They expected to hear lectures and read. Instead, they had to work in groups and to be responsible for their own progress. The students found the change from passive to active learning difficult to make. However, the results of the summative tests indicate that the problem based learning method produces good learning outcomes in this course. Student numbers rose in this course in 1999.

CONCLUSION Everett M. Rogers in the *Diffusion of Innovations* (1995) quotes Niccolo Machiavelli in *The Prince*:

> There is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new order of things ... Whenever his enemies have the ability to attack the innovator they do so with the passion of partisans, while the others defend him sluggishly, so that the innovator and his party alike are vulnerable.

The approach to introducing flexible learning adopted at the University of Otago was a high risk strategy. Choosing to convert high profile first year papers to flexible learning demanded that all the projects succeed. The staff in the Flexible Learning Unit mitigated the potential risks by adopting project management strategies requiring careful planning at the outset. The planning also involved ensuring that the participants had sufficient support at all times from senior managers and Heads of Departments.

An alternative strategy and safer approach might have been to deal only with a few subjects involving a small number of students in the final years of study. This method would have minimised the risk, but it would have had little impact on the rest of the University community. However, the costs of introducing the change may well have been the same. It became an important part of the decision

more accepted by industry. The principles of Quality Assurance (QA), used here as a global term rather than one to describe another specific theory, were subsequently adopted by service industries with great success.

The victory of the quality movement in technologically advanced Western countries was dramatic, effective and complete. In 1994, Morrison, with regard to British industry, wrote: "Now we are in the 1990s it is good to be able to record that the downward slide in quality appears to have halted and there are encouraging signs of industry beginning to respond to all the efforts that have been made to recover lost ground" (Morrison, 1994, p. 41). Quality is now expected, is built into processes and barely needs to be mentioned in the new, much more competitive and critical, global consumer culture of the late 90s.

One concept from this period that has stayed in the public view is adoption of, and accreditation with, the ISO 9000 family of international standards. These standards assure potential clients of a manufacturing or service industry that the organization will do what it says it will do, and that there are mechanisms in place to detect and correct non-conformance.

The tertiary education sector was slow to take up the new quality message and this resulted in the call for greater accountability and transparency from funding and regulatory agencies. The following arguments were put forth (with some justification) in support of the status quo by tertiary institutions:

- Quality is already assured through networks of peer review and the performance of graduates in the public and private sectors.
- Higher education requires much professional judgment that cannot be constrained by or contained within regulations. The best quality assurance is highly qualified, competent staff who put their research work out for peer review through regular publication in learned journals.
- Even if quality control measures were imposed, they could not be enforced because of issues related to academic freedom, tenure of position and autonomy of the institution.
- How can one combine adherence to standards with excellence? Institutions of higher learning are in the pursuit of excellence in teaching and research.
- Focusing on fitness-for-purpose or conforming to requirements could diminish the mission of the institution to be the critic and conscience of society.
- The ultimate aim of adopting QA (or TQM) in a service industry is to satisfy and/or delight the client. Many students spend 3 years or more in tertiary study driven by necessity, to attain a desired position possibly against their strong preference if they had a choice. Compared to students who are intrinsically motivated and who enjoy learning, the former might at times feel antagonism and little satisfaction with their study. How can the QA approach deal with this potentially large, negative group of dissatisfied clients, although later in life these same students might come to value and appreciate the experience?

It was (and is) suggested that a key performance indicator for universities is the number of research papers published by staff. Individual output is also recognised for promotion purposes; thus, vast numbers of papers in increasing numbers of journals have been and are being published. Such a system, where professors with a pool of eager and talented postgraduate students are particularly blessed, has caused growing dissatisfaction with the quality of this indicator. Commentators in the US have been particularly blunt. Morrison (1996) writes: "The vast majority of what passes for research publication in the majority of universities in America is mediocre, expensive and unnecessary; it is dispiriting and it depresses the whole scholarly enterprise". Finn and Manno (1996) state: "among 833,000 faculty members [in US institutions] it's a fair guess that no more than 50,000 will ever produce

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