Topic, background and goals

There is a widely held view in Australia and elsewhere, that the providers of higher education need to devise more flexible ways of reaching students (see for example The Web-Based Education Commission, 2000).

This paper reports on an investigation of the effectiveness of models of flexible provision of higher education in Australia. The study grew out of a concern about the effectiveness of flexible provision initiatives in affording study choices to students, particularly those in non-metropolitan regions of Australia. The ten cases of flexible provision chosen for close investigation were ones that provide higher education programs for students in non-metropolitan regions of Australia. The research questions were framed as:

- Are differing models of flexible provision of higher education apparent in Australia?
- Are models identified effective in the provision of higher education?

The latter question includes the concept of cost effectiveness.

This paper focuses on those aspects of the study of flexible provision of higher education in Australia which relate to utilisation of information and communication technologies (ICT). The paper describes the methodology employed in the study, addresses current understandings of the issues involved, depicts the findings and summarises the conclusions and recommendations arising from the study.

Key concepts

The notion of flexible provision is not defined in any agreed way in the research literature - in fact a variety of terms is used such as 'flexible delivery' and 'flexible learning' - nor is there a single, commonly adopted approach to it in practice. According to Kilpatrick (1997), any agreed definition of the flexible provision of higher education remains problematic because there is no universal model of it, and the related terms are used in various ways. Flexible provision may refer to the opening of choices to learners through the use of technologies and/or policies. Williams, (1995) in discussing flexible delivery refers to removing structural barriers such as entry, and literacy and language requirements, overcoming physical and other access issues, such as work and family commitments by providing access to appropriate learning environments. Flexible provision of higher education is defined here as provision which offers choice to students in regard to several of the following matters: content and assessment; place, time and pace of study; entry and exit arrangements; style of learning; and working individually or collaboratively.

Flexible provision of higher education may be afforded through the employment of various strategies including
the use of learning and teaching techniques and technologies such as CD-ROM, online materials, online communications, print materials, face-to-face tuition, distributed face-to-face sessions, video-on-demand, videotape, audiotape, video conferencing, teleconferencing, TV and radio. The term 'the flexible provision of higher education' also refers to the policies that are designed to provide flexibility such as open entry and content choices within programs. The study of flexible provision investigated cases drawn from ten Australian universities. Case selection was designed to cover a range of approaches to flexible provision. This paper confines its attention to those cases which made use of ICT as a major means of offering choice to learners.

Effectiveness here refers to producing the intended or expected result. The results expected in this research are dealt with in two ways: those which the providers declared were their intentions in making flexible provision; and a set of expectations which arose from conventional wisdom as indicated by the literature and an initial survey of Australian higher education providers. Aside from intent of providers, the indicators of effectiveness employed were: access, including regional access; valued learning outcomes; student satisfaction; staff satisfaction; satisfactory student retention/completion rates; and cost effectiveness.

Cost effectiveness could be regarded as efficiency, that is the attainment of intended or expected outcomes with limited demand on resources. In the present study cost effective provision was defined as provision which rated well against the flexibility and effectiveness indicators listed above and made limited demands on a range of resources, namely: infrastructure; direct operating costs; support services; and academic staff time. The approach taken was not to add up $ costs, as this would fail to take account of the total time committed by staff, but to make judgements on the basis of interviews, observations and reports of case authors. Cost effectiveness in this study is indicated by high effectiveness and low unit costliness. Unit costliness may be lessened where the scale of operation is increased. The scale of operation then is a consideration in assessing cost effectiveness.

Research approach and methodology

Research genre

The research genre adopted was interpretative. Neither universities nor programs can be sorted into simple flexible and non-flexible categories. Each case is peculiar. In view of this the identification of variables associated with effective flexible provision of higher education was not attempted, rather, the investigation involved the identification and description of cases of flexible provision of higher education. The descriptions utilise both qualitative and quantitative data.

Each university in Australia was provided with the definitions employed in the study and a rudimentary conceptual schema and was invited to indicate policies of the university directed at flexible provision of higher education. For each policy they were requested to provide a rationale and an example or examples of practice.

All universities responded. For the purposes of the study two broad categories and six strategies of flexible provision of higher education were distinguished on the basis of literature and responses to the survey.

1. Provision affording access and convenience:
   - Moving time and place of study to suit the learner.
   - Removing fixed time and place constraints.
   - Removing entry requirements.

2. Provision accommodating learning preferences:
Case study methodology

The effectiveness of models of flexible provision of higher education was explored in the present investigation through case studies. The case study reports constitute descriptions of the context of the case, policies relevant to the case, practices, student participation, learning outcomes and cost effectiveness. Ten cases were selected. The ten cases cover the notional models of flexible provision identified in the initial survey of universities. The cases, however, do not match the notional models. Most span two or three models. In selecting the cases a focus on provision for non-metropolitan regions was a factor.

Findings

Cases

Seven of the ten cases involved use of ICT though in none of the cases studied was the tuition entirely reliant on ICT. Summaries of findings were developed for each case along the lines below.

Swinburne University of Technology (Lilydale campus)

The Lilydale campus of Swinburne University of Technology, was established to tailor a program of Higher Education specifically for students in outer eastern Melbourne. It has adopted Multi-Modal Learning as its approach to the flexible provision of higher education. Learning Guides, online materials, online discussion, drop in tutorials and video on demand, as well as face to face sessions, are all parts of the repertoire of resources and activities. Multi-Modal Learning is intended to enable students to choose for themselves when to study, where to study, what to study, how they study and with whom they study. The investigation found that:

- Flexibility is offered through the regional location of the campus and the multi-modal approach adopted that allows students to choose combinations of face to face, online, print and video on demand tuition modes. The multi modal approach accommodates individual learning style preferences. Flexibility is limited by course requirements and in limits to content and assessment choices in some subjects.

- The provision is effective in terms of regional enrolments, accommodation of work commitments, development of generic learning skills, attainment of intended learning outcomes, and retention and completion rates. There is a high level of student satisfaction generally though there are some concerns with constraints on flexibility. Staff indicate enthusiasm for the approach and commitment to it but express concerns about workload and limited opportunities to engage in research. The provision satisfies the commitment of the university to flexible provision of higher education on its Lilydale campus though the face to face component is greater than originally envisaged.

- Equipment and infrastructure costs are marginally more expensive than for traditional provision. There are some additional support costs but the operating costs are low for the number of students enrolled. The operation places high demands on academic staff time.

- The case could be described in summary as highly flexible and as effective but as somewhat demanding on academic staff time though not on operating funds.
Abridged summaries of findings are provided below for the other cases that involved ICT.

**University of South Australia (Bachelor of Nursing, Whyalla campus)**

Whyalla campus is South Australia's only regionally based University campus. Currently over 40 percent of the campus's student enrolments are off-campus. The largest off campus program is the Bachelor of Nursing, which has 147 of 254 students enrolled in various forms of resource-based flexible delivery including electronic delivery via UniSANet. Recognition of prior learning is arranged through an agreement between the University and TAFE. The investigation found that:

- Time and place flexibility are provided through use of printed materials and online learning together with locally provided workshops. A mix of media accommodates different learning styles. There is some flexibility in entry requirements and some choice of subjects.

- The case could be described in summary as flexible and effective but incurring some costs additional to traditional approaches.

**University of Tasmania (Bachelor of Adult Vocational Education, Launceston campus)**

Because most of the prospective students in this field are mature aged and are currently employed, the adoption of flexible teaching and learning principles are a high priority. The emphasis has been toward a more open, accessible and equitable delivery framework. The investigation found that:

- Convenient access is provided for students in northern Tasmania and the use of print and electronic materials provides some time and place flexibility and caters to some extent for differing learning styles. There is some flexibility in entry arrangements. The course, particularly through assessment tasks, is tailored to student interests.

- The case could be described in summary as a program which offers some time and place flexibility, which is effective in educational and provisional terms, and which is not costly.

**Griffith University (Logan campus)**

The Logan Campus was established as an institutional centre for innovation in flexible learning with the intention of diffusing outcomes, through adaptation, across the university. Staff are encouraged to integrate formal face to face activities with a range of more resource-supported independent peer-based and individual learning activities. All subjects use the Web and the Internet. The architecture links academic buildings and the Information Services Centre. The investigation found that:

- The campus provides the opportunity for regional participation. Making use of a mixture of print materials, online and video materials and communications and face to face activities it provides time and place flexibility and caters for alternative learning styles. It offers some entry flexibility. It encourages collaborative learning. Usual course requirements apply.

- The case could be described in summary as highly flexible, substantially effective but tending to be costly, particularly in the initial phase.

**University of Queensland (Ipswich campus)**
This campus was purpose-built for flexible learning. Students have access to an array of learning resources across a range of media to support their learning, as well as on campus attendance for small group work to support more collaborative learning. The investigation found that:

- The Ipswich campus provides time and place flexibility for students, particularly those coming from the region. Using a combination of face to face sessions, printed, online and CD materials, and online communications it provides for alternative learning styles. The programs offered involve normal university entry and progress requirements but provide some course choices.

- The case could be described in summary as highly flexible, substantially effective but involving some costs additional to the usual.

**Charles Sturt University (Dubbo campus)**

The campus was intended to provide access to Higher Education in a region under-represented in the Higher Education sector. Students learn through a combination of conventional distance education, face to face teaching, interactive video and ICT strategies. The investigation found that:

- The place of the provision is designed to suit the needs of students resident in Dubbo and surrounding areas. The format involving limited face to face and video teaching supported by distance education materials and online communications provides time and place flexibility, though some students appear unaware of their choices. Normal entry and course structure requirements apply but there is some choice offered in assessment tasks and some peer interaction employed.

- The case could be described in summary as a flexible form of regional provision, which produces intended results, but at the expense of some additional demands on resources.

**University of Southern Queensland (Distance Education Centre)**

USQ employs a range of teaching techniques including the use of regional liaison officers and remote study centres, print materials, audio tape/teletape, video tape, teleconferencing (audio, audiographic, video), computer managed assessment/computer-based exercises, CD-ROM multimedia presentation, computer mediated conferencing, and internet material. The investigation found that:

- The University of Southern Queensland offers a high level of time and place flexibility to students providing the option of on campus, off campus and mixed studies. Regional and remote students are provided with local liaison support and outreach support. The use of print and online materials in conjunction with online, video and audiographic communications together with opportunities for collaboration provides for a range of learning styles. There is some flexibility with entry requirements and assessment arrangements but students are constrained by normal course requirements.

- The case could be described in summary as a highly flexible and highly effective economical provision.

**The effectiveness of models for flexible provision of higher education**

As a descriptive/interpretative approach is taken and as each case differs substantially from other cases, it is not appropriate to make generalised conclusions. Nevertheless the case findings can be said to indicate that:

- The cases of flexible provision of higher education investigated were indeed flexible - that is they offered choices to students
The cases could be classed as effective against the criteria of effectiveness adopted for the study as well as in terms of the intent of the universities in offering flexible arrangements.

**The cost effectiveness of models for flexible provision of higher education involving ICT**

Cost effectiveness was addressed in this investigation by separately considering effectiveness and costliness. As for flexibility and effectiveness, a picture of cost effectiveness of flexible provision of higher education emerges from the case studies.

Flexible provision in most of the cases surveyed made marginal additional demands on infrastructure costs due in part to their innovative status involving establishment costs. In most cases there was some additional demand on support services.

The major distinction between cases was in demands on staff time.

For institutions with established off-campus or multi-modal arrangements and which made allowance for design and development demands in staff workloads, flexible provision was not costly, though even in these institutions communication with students was increasingly demanding on academic staff time.

For institutions without a background in off-campus education, initiatives placed extra demands on staff time which were not necessarily reflected in additional budget allocations and were satisfied in part at the cost of time spent on research and/or by staff working longer hours.

For these latter institutions the scale of operation of flexible provision was generally small. There may be opportunities for adoption of more economical procedures with increases in the scale of operation.

**Conclusions and recommendations**

**Conclusions relative to the literature**

As indicated in the National Board of Employment, Education and Training report (1997) approaches involving resource-based learning did offer students some choice about learning styles and, in line with the expectations of Diaz and Cartnel (1999), offered time, place and pace choices to both staff and students.

There was some indication from the study that flexible provision of higher education was helping to counter the disadvantages of students in non-metropolitan regions in accessing higher education which was identified in Stevenson, Maclachlan and Karmel (1999).

In line with conventional wisdom - Kulik and Kulik (1991), Billings (1994) and Leasure's (2000) - no change in course-specific learning outcomes was observed. However some improvement in attainment of generic skills along lines suggested by Clark (1998) was indicated.

As suggested in some literature - for example Cragg (1994) and Billings, et al. (1994) - both staff and student satisfaction responses were bi-polar. Flexibility was much appreciated but it came at a cost. For some students staff contact was too limited; for others less flexibility was available than they anticipated. For staff flexible provision often involved a higher workload.

As suggested by Kirkpatrick (1997) and Inglis, Ling and Joosten (2002) Australian higher education institutions adopted flexible provision strategies for a variety of reasons including exploiting new knowledge
technologies to provide economies, to enable wider participation of local students, and to increase involvement of overseas students.

While there was the potential to achieve economies of scale as identified in the model employed by Inglis, Ling and Joosten (2002) the potential was not realised at this point in most of the cases surveyed.

**Implications and recommendations**

Each case is individual, reflecting institutional responses to their own histories, needs and environments and the research approach adopted together with the focus on non-metropolitan institutions does not lead to generalisable conclusions. A review of the findings of the cases in conjunction with the literature does, however, suggest *some possibilities* for effective and cost effective flexible provision of higher education which inform the following recommendations:

- Universities, rather than making incremental and additive changes to programs, should consider redesigning programs for flexible provision taking into account the educational potentials of available media, opportunities for economies of scale and the constraints on available resources, particularly academic staff time.

- Universities should seek opportunities to make use of tuition materials for both on-campus and off-campus tuition and combinations of the two in order to make provision economical and to make provision flexible in terms of time, place and learning style preferences of students.

- Universities should seek opportunities to spread design and development costs of tuition materials including collaboration between institutions, voluntary or commercial pooling of learning resources using data-tagging, and the purchase of commercially available materials.

- Universities should consider making more use of infrastructure and resources outside of the higher education sector, such as those in the workplace and the home, which are available at little cost to the education provider and are convenient for the learner.

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**References**


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