The Effectiveness of Flexible Provision of Higher Education in Australia

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Abstract

This paper reports on an investigation of the effectiveness of models of flexible provision of higher education in Australia. The study was commissioned by the Australian Department of Education, Training and Youth Affairs. In this study flexible provision is defined in terms of providing choice for learners because this is expressed or implied by educational providers in using the adjective ‘flexible’.

The methodological challenge faced in this study was how to address hard-edged research questions in the context of a variety understandings of key terms, the individuality of the approaches taken by providers, and a want of agreed measures of effectiveness. In response the investigation employed case studies researched and described around a set framework of topics and evaluated against criteria for flexibility, effectiveness and cost effectiveness. A summary of each case was depicted graphically. The depictions – referred to as ‘depictograms’ – provided a means to readily compare the cases.

Focus

There is a widely held view in Australia and elsewhere, that the providers of higher education need to devise much 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 cases chosen for close investigation were ones that provide for students in non-metropolitan regions.

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.
Purpose of the paper

This paper describes the methodology employed in the study, addresses current understanding of the issues, 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, TV and radio, video-on-demand, videotape/audiotape, video-conferencing, and teleconferencing. The term ‘the flexible provision of higher education’ also refers to the policies that are designed to provide flexibility such as: open entry; recognition of prior learning; credit transfer arrangements; articulated and embedded awards; content choices within programs; multi-modal provision of education; and negotiated assessment.

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.

In terms of intent, Kilpatrick (1997) notes that, as with open learning, there are several different discourses about the flexible provision of higher education. These include learning with technology and increased equity and access. When it comes to flexible provision there are also discourses related to the means by which institutions can achieve a competitive edge and increase efficiency and accountability. As Shapiro (1993) commented, these discourses arise from the way higher education is being transformed by increased use of new technologies, limits to public funding, demands for greater public accountability, increased competition, and the challenges associated with dealing with the needs of a quasi-mass, as distinct from a quasi-elite, system. In the present study responses to an initial survey of universities indicated a range of intentions in adopting flexible provision.

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 [note that these categories are not mutually exclusive]. 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

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. The quantitative elements were employed descriptively rather than inferentially.

Initial survey – models of flexible provision of higher education in Australia
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.

Three major themes emerged from the data. Many universities defined flexible provision of higher education in terms of offering choices to learners. Of these there were universities who understood flexibility to be directed at access. There were other universities who understood flexibility as being about accommodating a range of learning needs and preferences. The third common response referred to the use of new learning technologies to address the quality of learning as well as providing new options for learners.

The survey of universities indicated a wide range of approaches to the flexible provision of higher education. In fact for many universities several approaches co-existed. For the purposes of this study two broad categories and six strategies of flexible provision of higher education have been 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:
   - Providing alternative entry and exit points
   - Accommodating learning style, pace and collaborative learning preferences
   - Accommodating content and assessment preferences

Research schema
These broad categories and strategies provide a typology of flexible provision of higher education in Australia and a basis for the selection and analysis of cases (see Figure 1).
Figure 1: Effectiveness of Flexible Provision – Research Schema

Flexible provision of higher education:
A mode of provision which provides learners with
choice
through the use of appropriate learning and teaching

Elements of flexibility
Choice for learners about:
place
- time
- pace
- style
- content
- entry/exit
- assessment
- collaboration

Techniques & technologies for provision:
- print materials
- ed rem
- online materials
- online communications
- face-to-face
- distributed face-to-face
- video-on-demand
- video tape / audio tape
- video conferencing
- teleconferencing
- TV / Radio

Policies for provision:
- open entry
- recognition of prior learning
- credit transfer arrangements
- articulated and embedded awards
- program choices
- multi-modal provision

Models / Typology
Types of flexible provision of learning:
- Strategies for involving techniques & technologies, &/or policies
- Access and convenience oriented provision
- Removing fixed time and place constraints
- Removing entry requirements
- Learning preference oriented flexibility
- Accommodating learning style, pace & collaboration preferences
- Accommodating content & assessment preferences

Indicators of flexibility, effectiveness and cost effectiveness of models investigated through cases

Literature and current understandings in relation to the schema

Choices offered to learners
When institutions pursue polices and practices designed to provide higher education programs more flexibly a key intention is to give students, and for that matter lecturers, choice about the place, pace, timing, style, and other aspects of their learning. A National Board of Employment, Education and Training report (1997) found that resource-based learning could offer customised higher education programs, accommodate individual learning styles and individual learning goals and provide time and place convenience for both staff and students.

The use of technologies in the provision of higher education is sometime identified with flexible provision and offering choice. For example, in the present study several universities responded to requests for information about policies on flexible provision with policies about online provision. However, in a yearlong study of a project designed to flexibly provide courses across Europe via television, video conferencing, e-mail, computer conferencing and access to the web, Collis (1996)
discovered that students were offered minimal choice despite the use of technologies. There were several reasons for this, including the time constraints that course developers experienced. Those lecturers wanting to build choice into their offerings, were not given sufficient time to do so. Several lecturers’ thought that their university required them to use traditional approaches to teaching and learning that did not provide choices for the students. It also seems that providing choice is perceived as being costly. Collis (1996) notes that the ability to construct inventive courses that do give students choice was largely ‘outside the scope of most course providers.’ Green (1999) made a similar observation.

Diaz and Cartnel (1999), on the other hand, suggest that preferred learning style can be accommodated through the use of flexible learning strategies. His work shows that learning style may influence the choices students make. Independent learners, it seems, may choose online courses while dependent learners choose on-campus courses. Online learners may be driven by intrinsic motivation, preferring independent learning. Where courses offer flexibility about individual or collaborative study, there is some evidence that courses promote collaborative learning (Landis and Wainwright, 1996).

Access
Flexible provision includes the use of a range self-paced, resource-based and technology enhanced forms of tuition to address access and equity issues. A range of learning venues (for example workplace, home, learning centre) may be utilised, together or separately, to meet the needs of those learners under-represented in higher education, including those in non-metropolitan regions.

Stevenson, Maclahan and Karmel (1999) addressed the issue of physical location as a factor in people’s participation in higher education in Australia, in an examination of the variation in participation and provision across regions. They found that ‘tertiary education participation rates are very much higher in metropolitan regions than in non-metropolitan regions [and that] inequality across metropolitan regions is almost as important as the inequality between metropolitan and non-metropolitan regions’. They concluded that both proximity to university facilities and ‘factors other than distance to university’ play an important role in university participation.

Much of the literature in this area is concerned with equity issues. The National Board of Employment, Education and Training report on resource-based learning (1997) found that while resource-based learning offers time and place flexibility there is a possibility that financially disadvantaged groups might be further disadvantaged.

Student learning outcomes
Much of the research relating to the impact of flexibly delivered courses on student learning has a techno-centric orientation. That is, the studies often assume that the technology is the vital part of making flexible provision for learning. Insofar as it does involve technology, a meta-study of research projects on computer-based learning undertaken by Kulik and Kulik (1991) is pertinent. It found that there was no significant difference between learning outcomes attained by traditional approaches and computer-based approaches. Billings (1994), focusing on distance education, likewise discovered that there was no significant difference in learning outcomes between distance education courses and on-campus courses. Leasure's (2000) findings support this.

Rodrigues’ study (1999) shows that flexible provision, involving both face-to-face and online discussions, is strengthened when ‘face-to-face sessions are used to enable camaraderie to
develop and continue in online discussions.’ When the flexible provision of learning is thought of more in terms of self-managed learning, collaborative learning, cognitive apprenticeship and the like another view of its impact on learning outcomes emerges. Ryan, Carlton and Ali (1999) found that students participating in web-based courses develop improved critical thinking skills and creativity. Clark's (1998) study shows that there is parenthetic, additional learning that is developed, especially computer competency, when students undertake web-based courses. Ribbons (1998) also found improved higher order thinking skills and online team building and collaboration when students learn online. Bilge’s (1999) study suggests that ‘collateral learning’ occurs when students experience the flexible provision of higher education. He observed the way learning became more self-directed and the students developed improved lifelong learning skills.

The Web-Based Education Commission of the U.S.A. (2000) refers to the promise of the internet to provide learning centred around students rather than classrooms, to focus on individual learners and to make lifelong learning a possibility Diekelman’s study (2000) shows that technology-based distance education can encourage the teacher to reconsider, and improve upon traditional pedagogy; notwithstanding that it can be daunting for teachers to have to do so. Others refer to the way web-based courses usually enable quicker and richer feedback to students based upon a greater array of assessment techniques (Misko, 1994).

On the other hand, Ward’s study (1998) found that students’ use of Web materials is tied to their conceptions of traditional higher education. They explore little; rather they use the web as a carrier of materials. In effect, the web becomes little more than a ‘page-turner’ for them. George and Luke’s (1996) study throws doubt on whether students have the necessary levels of information literacy to enable them to effectively engage flexible learning.

Commentators note the tensions that exist between learner needs and certain techniques that are used to more flexibly provide higher education. Ferguson (1998) for example, points out the difficulties that exist for engineers doing required laboratory experiments online. Some science faculty feel that laboratory work cannot be taught online or at a distance. Feenberg (1999) also points out that appropriate pedagogy has still to be worked out for the flexible provision of higher education. Currently the old pedagogy of the lecture still dominates.

**Student satisfaction**

In some cases, flexibility in the timing of the learning has been found to have appeal to students. Cragg (1994), for instance, found that registered nurses in a post-registration nurses baccalaureate program found ‘time shifting’, the ability to participate in learning activities at the learner's convenience, to be a major advantage of a computer-mediated conference course.

However, there are many studies that highlight the frustration experienced by students in web-based courses regarding the difficulty of accessing web-based materials and technical problems. Moreover, videoconferencing to give lectures, when used on its own, has been shown to be unappealing to students (Feenberg, 1999). Some studies indicate that students often feel isolated in flexibly delivered courses (for example Cragg, 1994).

**Staff satisfaction**

Flexible provision of higher education can offer time and place flexibility to staff as well students. However, developing online courses, and teaching online, are frequently not yet in the criteria for staff promotion and may not even be counted in workload. There is often an increased workload when distance education strategies are used (Billings, et al. 1994).
Student participation

The provision of higher education in flexible forms is increasing rapidly and the growth can be expected to continue. The Web-Based Education Commission (2000) notes a growing use in the U.S.A. of online content and tools in traditional courses with 40 percent of colleges using Internet resources (compared with 15 percent in 1996) and 59 percent using electronic communications for tuition purposes (compared with 20 percent in 1995). Off-campus use of online delivery is also growing rapidly in the U.S.A. with 84 percent of four-year colleges expected to offer distance learning courses by 2002 (compared with 62 percent in 1998) and 2.2 millions students expected to enrol in distance education courses by 2002 (compared with .7 million in 1998).

There has been a large increase in the demand for places in higher education in Australia as elsewhere over the last fifteen years. Cameron (1998) considers flexible learning to be an important means of meeting the demands of ‘credential creep’. Flexible provision of higher education is in part designed to meet a continuing increase in demand, including demand from people with work and domestic commitments and people in non-metropolitan regions.

The intent of institutions in providing higher education more flexibly

There is literature that addresses the motive of institutions in developing policies directed towards the flexible provision of higher education. Evans (1999) notes that flexible provision is a way former regional Colleges of Advanced Education maintain a position in the current competitive arena of higher education. They do this by converting existing on-campus courses into dual mode operations, which incidentally produce economies of scale.

In a case study of one Australian higher education institution, Kirkpatrick (1997) discovered that there were four main reasons advanced within the institution for pursuing more flexible approaches to learning and teaching. They were:

- Developing niche markets both with local students and with overseas students.
- Being more equitable by enabling greater participation in higher education by traditionally under represented groups.
- Becoming more efficient, especially in terms of ‘provision’ capacity.
- Exploiting new knowledge technologies that enable mass education, usually at a distance.

There are multiple reasons for increasing flexible provision of learning. Inglis, Ling and Joosten (1999) suggest institutions adopt digital approaches to delivery of education because, compared with traditional distance education, it is faster, cheaper and better in terms of presentation of the learning materials, support provided to students, and interaction that is possible between teacher and student and amongst the students themselves.

It is clear that there are more agendas for the flexible provision of higher education than simply improving the quality of student learning per se or otherwise catering for the needs and preferences of learners. Investigating the motives for institutions attempting to provide higher education more flexibly is an element of the present study.

Cost effectiveness

The matter of the cost-effectiveness of the strategies for the flexible provision of learning is complex. Some studies examine the cost effectiveness issue in terms of comparable learning outcomes. Whittington's (1987) meta-analysis of over a hundred studies related to distance education identified that, regardless of the distance education provision system, students receive a
comparable education. The systems provided, however, can be more or less costly with small scale, multimedia-intensive provision being at the high cost end.

Inglis, Ling and Joosten (1999) argue that cost effectiveness needs to be examined from the viewpoint of investment and economies of scale. Their work shows that an increase in student numbers in a resource-based course from less than a hundred to several hundred can result in substantial economies of scale but that the economic advantage of increased scale tapers off. The major costs in flexible provision are:

- Infrastructure costs
- Materials development costs
- The costs of communicative interaction with students

The Web-Based Education Commission (2000) points to infrastructure and development costs associated with online provision. They suggest that ‘technology is expensive and web-based learning is no exception’. Development of online courses can take anything from 66 percent to 500 percent longer than creating traditional courses. When it comes to flexible provision of higher education, the provision may involve multiple modes of tuition, including face-to-face tuition. The Web-Based Education Commission observes that ‘… if technology is used as an add-on to existing activities, rather than as a means to reshape education, then it will simply add to the total cost of operations and few savings will be realised’ (Web-Based Education Commission, 2000).

Taylor (1999) notes that models of distance education have moved from a first generation of printed correspondence courses, through multimedia and telelearning, to a fourth generation of flexible learning that involves Internet based access, interactive multimedia and computer mediated communication. This format involves each of the costly components of infrastructure, materials development and communicative interaction. Taylor has proposed a fifth generation that develops elaborate databases of responses to student communications thus automating elements of the communicative function and containing costs.

**Case study methodology**

**Case studies**
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.

**Data Presentation**
The methodological challenge faced in this study was how to address hard-edged research questions in the context of a variety understandings of key terms, the idiosyncratic practices of providers, and a want of agreed measures of effectiveness. In response the investigation employed case studies researched and described around a set framework of topics and evaluated against criteria for flexibility, effectiveness, and cost effectiveness.
A summary of each case was depicted graphically against these criteria in a standard form. The depictions are referred to as ‘depictograms.’ A depictogram is a tool for providing a graphic summary of an interpretation of data derived from descriptive case studies. It uses shaded bars located by agreement between two or more researchers and descriptors typical of the qualitative data relating to each case. The format, using data typical of the cases, is illustrated in Figure 2. A separate depictogram was drafted for each case study allowing cases and elements of each case to be compared.

Each case is plotted by two or more researchers against criteria for flexibility, effectiveness and costliness using shading and descriptors drawn from qualitative and/or quantitative data.

The findings from the individual case studies were agglomerated graphically in the conclusion to the present study to give an overall picture of the flexibility, effectiveness and cost effectiveness of the cases investigated.

Findings

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 finding can be said to indicates 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 findings are represented in summary in Figure 3. In the summary graph each case is represented on the axes according to the range of flexibility and the range of effectiveness indicated in the depictogram of the case. The idea of the summary graph is to give an overall impression of the findings of the study with regard to the flexibility and effectiveness of models of flexible provision.
Figure 2: Depictogram example (simulated)
The cost effectiveness of models for flexible provision of higher education

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, which suggests that:

Each ellipse represents one case. The ellipse is plotted against the Effectiveness and the Flexibility axes according to the charting of the case on its depictogram (see Figure 2).
- As indicated above, the cases could be classes as effective.
- Flexible provision tends to make marginal additional demands on infrastructure costs. In most cases it made additional demands on support services and academic staff time. The additional demands on the resource academic staff time are not usually reflected in additional budget allocations. The demands on academic staff time are satisfied in part at the cost of time spent on research and in part by staff working longer hours.
- The costliness of most of the cases studied is due in part to their innovative status involving establishment costs and small scale of operation.
- For institutions with established off-campus or multi-modal arrangements and which made allowance for design and development demands, flexible provision was not costly, though communication with students was increasingly demanding on academic staff time.
- There may be opportunities for adoption of more economical procedures, particularly with increases in the scale of operation.

In the summary graph in Figure 4 each case is represented on the axes according to the range of effectiveness and the range of costliness indicated in the depictogram of the case. The idea of the summary graph is to give an overall impression of the findings of the study with regard to the flexibility and effectiveness of models of flexible provision.

**Figure 4: The cost effectiveness of models of flexible provision of Higher Education**

Each ellipse represents one case. The ellipse is plotted against the Effectiveness and the Costliness axes according to the charting of the case on its depictogram (see Figure 2).
Conclusions

Reflections against the literature

Expectations drawn from available literature in relation to areas explored in the present study are identified above. The conclusions of the study allow reflection on these expectations in relation to: choices offered to learners; access; student learning outcomes; student and staff satisfaction; student participation; the intentions of institutions in making flexible provision; and cost effectiveness.

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) and Bilge (1999) was indicated. As suggested in some literature – for example Cragg (1994) and Billings, et al (1994) – both staff and student satisfaction responses were bipolar. 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.

The provision of higher education in flexible forms is increasing and along with it higher participation is occurring. To date, the extent of this higher participation in Australia has not been as extensive as anticipated by the Web-Based Education Commission (2000) in the U.S.A. but it has nevertheless been substantial.

As suggested by Kirkpatrick (1997) and Inglis, Ling and Joosten (1999) 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 (1999) the potential was not realised at this point in most of the cases surveyed. Infrastructure and development costs, in line with the expectations of Evans (1999) and the Web-Based Education Commission (2000), make flexible provision marginally more demanding on resources, especially academic staff time, than traditional approaches.

Recommendations

Each case is individual, reflecting institutional responses to their own histories, needs and environments and the research approach adopted 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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