The Influence of Delivery Mode on Consumer Choice of University

Pauline Hagel, Deakin University, Australia
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[to cite]:

[url]:
http://www.acrwebsite.org/volumes/13856/eacr/vol8/E-08

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ABSTRACT
This paper reports on an empirical investigation into the importance of study mode in the choice of university by Australian student-consumers, using conjoint methods. Traditional approaches to investigating student choice have overlooked study mode because they assume a norm of face-to-face attendance on-campus. Three segments were identified based on the relative importance which students placed on the university, study mode and tuition fees in making their choice, and the segments were distinguishable on some demographic and situational variables. The findings have relevance to universities across national and reputational markets in making their decisions about how to deliver educational products.

INTRODUCTION
Understanding the importance to student-consumers of how educational products are delivered is of relevance to universities as they plan to meet the demands of dynamic political, technological, and market environments. The delivery or “study mode” refers to the means by which educational programs are delivered to students, and is distinct from both “attendance mode” or “attendance type”. In Australia, attendance mode may be internal, external or multimodal, while attendance type may be part-time or full-time. Increasingly, differences exist in the way students are enrolled and the actual study modes they experience. For example, students may face a blend of options or hybrid study modes such as web-supplemented, web-dependent or wholly online. Many universities are developing online learning as either an ancillary or a stand-alone mode of delivery (see, for example, Allen and Seaman 2006). Simultaneously, part-time students and full-time students with supplementary employment are assumed to welcome the flexibility such a delivery mode brings. However, much of this development of flexible delivery is supply and technology driven, and neglected by researchers into student university choice. Consequently, the purpose of this paper is to report the findings of an empirical study that investigated the importance of study mode to students in the context of their university choice decision.

LITERATURE REVIEW
Studies of the criteria that traditional students use in choosing between universities have been prevalent in the US literature for several decades due to declining demand for college education and to the decentralised and heterogeneous nature of the market for higher education (see, Jackson 1982). However, in countries such as Australia and the UK, investigation of the criteria which students use in selecting a university is relatively recent and is occurring in response to increasing inter-university competition and rising levels of tuition fees.

In examining the important criteria in choice, the focus is on one stage of the university choice process—that of evaluation between institutions (see, Jackson 1982). Reportedly, this evaluation tends to come towards the end of the university choice process when, generally, students have narrowed down their choice set to several institutions to which they can reasonably expect to gain entry (see, Moogan et al. 1999). Models of university choice assume that students are largely rational; they make a profit-maximising choice in seeking investment and consumption benefits from their higher education. Further, students are assumed to conceive of their choices as “bundles of attributes” and have preferences for the attributes rather than products as a whole. In evaluating these options, students are thought to attend to a few specific characteristics of universities (see, Jackson 1982).

Notwithstanding some differences, a similar set of characteristics has been identified as important to university choice in the US, UK and Australia. In summary, these have included academic reputation, course availability, location, tuition fees and amenities. However, a question arises about the completeness and continued relevance of this set of characteristics. Pascarella and Terenzini (1998), for example, noted that studies of university choice in the US have been dominated by the choice made by traditional participants in higher education and by those who aspire to the research or liberal arts universities. Consequently, conventional studies of university choice have featured two main assumptions, usually implicitly: the first about what constitutes a university and who its students are, and the second, about the normal means of attendance, that is, full-time and face-to-face study.

School leavers no longer dominate higher education markets in many developed nations (Levine 2001). In Australia, as elsewhere, the undergraduate university population has diversified to include many non-traditional students and international fee-paying students. Further, even traditional school leavers engage increasingly concurrently in work and study, and students faced with the rising cost of higher education are growing more pragmatic, instrumental and consumerist in their educational choices.

Accompanying these changes in the student population are changing conditions of supply. With the growth in student numbers and declining government financial support, universities in Australia and elsewhere have had to find means of providing education that are more efficient and that meet the needs of their, increasingly, self-funding students. Simultaneously, alternative forms of delivery have emerged, often facilitated by information and communications technology (ICT). These have provided universities with more options in the way they can deliver education programs. Many universities have adopted ICT-based forms of delivery in the belief that these will be more cost effective, cater for diversity, reach new markets, signal the innovativeness of the university, and promote its competitiveness in globalising markets (see, Cloonan 2004). However, there has been little examination of the importance of study mode in university choice.

Preferences for alternative forms of delivery or study mode have been investigated in relation to non-school leavers including distance education or part-time students (see, Robyler 2000). However, rather than examine their university choice, these studies investigated why students attended by non-traditional means or enrolled in non-traditional institutions. Some studies have investigated the importance of flexible delivery or distance modes to student choice (see, James et al. 1999). However, the enquiry about study modes has been one-way: “How important are flexible modes in your choice of course or university?” No studies were found that asked traditional students about the importance they placed on being able to study on-campus, face-to-face when choosing a university course. This question is of equal importance to that of flexibility. While universities promote flexibility and pursue efficiency, this may be at the cost of the on-campus experience for some students. What are the study mode preferences of international students who pay full fees and come to a particular country for the experience itself? How do students, in general, perceive and value
Models of university choice assume that students make trade-offs between the attributes of universities in making their final selections (see, Jackson 1982). This process may be conscious and/or unconscious. However, there have been very few studies that have investigated the actual trade-offs which students make between attributes. A popular method for examining trade-offs in decision-making is conjoint analysis which enables preference to be decomposed into its constituent parts. Three published studies have reported findings for undergraduate university choice using this method (Hooley and Lynch 1981; Soutar and Turner 2002; Moogan et al. 2001). The findings of all three studies about the relative importance of the course, academic reputation and location were generally consistent with the literature. However, none of these studies examining students’ trade-offs between criteria, included fees and costs. This was understandable given the context of the studies. These were conducted in the UK and Australia at a time when university fees were a minor consideration for most domestic undergraduate students. Further, none of these studies included study mode as a criterion in choice. Those studies that have included some reference to study mode have focused on alternatives to face-to-face modes, that is, forms of flexible or distance education. Finally, most previous studies of university choice have examined the choices of relatively homogeneous groups of students.

Consequently, two questions are addressed in this paper:

1. What trade-offs do consumers make between course at university, tuition fees and study mode in making their university choice?
2. What segments exist based on the importance placed on these attributes in university choice?

METHOD

A traditional, or “main effects” conjoint analysis was used, which assumes a compensatory choice strategy whereby poor performance on one attribute (e.g., price) can be compensated for by good performance on another (e.g., reputation). A respondent’s overall rating of an option is assumed to be a summation of the individual utilities for each attribute. It was considered a suitable method for exploring university choice for several reasons: firstly, prospective students are thought to evaluate systematically only a small set of alternatives (Dawes and Brown 2004); secondly, students have been found to use compensatory methods to evaluate their final choice set (see, Moogan et al. 1999); and, thirdly, the method does not rely on respondents being able to articulate the value they place on different criteria. Further, conjoint analysis is a useful method for understanding how people behave as competitive conditions change (Huber 1997).

Three attributes were selected for inclusion: “university”, “study mode” and “tuition fee” (see Table 1). The number of attributes was restricted to three to keep the conjoint task simple for respondents. Both positive and negative attributes were included as recommended by Hair et al. (1998). The attributes and levels for the conjoint were determined after an analysis of the Bachelor of Commerce (BCom) degree market in Australia and the conduct of a focus group of BCom students. The three attributes were judged to be distinct conceptually, communicable and actionable (see, Hair et al. 1998).

The first attribute, university, incorporates elements of reputation or prestige, geographic location and amenities. The university attribute was operationalised as four universities that characterise the reputational diversity of the higher education system in Australia (Marginson and Considine 2000), situated in one Australian State, to ensure that the universities provided a realistic choice set for prospective students wishing to study on-campus.

The second attribute, study mode, represents the functional quality of the service, which is a critical aspect of what students purchase. Study modes influence the convenience, flexibility and interpersonal interaction that students experience, and each provides different combinations of these benefits.

The levels of study mode were chosen to reflect a range of feasible practices. Official enrolment in Australian higher education can be either on-campus, face-to-face, or alternatively, off-campus, by external or distance modes. In Australia, and countries with a similar history of distance education, there are two main types of distance education: paper-based mail delivery and web-based, online delivery. The three terms used to describe study modes in this study have precedence in the literature, and the term “web-based” is used to define a study mode that is online (see, for example, Sweeney and Ingram 2001).

The third attribute, tuition fee, represented the monetary price of the product. Price is usually included in conjoint studies because it represents a “distinct component of value” (Hair et al. 1998, 407). The price levels chosen were realistic in reflecting both the low and high ends of prices for a BCom, and the highest and lowest were set just outside existing values as suggested by Hair et al. (1998).

The inclusion of three attributes (two attributes with four levels and one with three levels) meant that 48 different course profiles were possible. To limit the number of profiles rated by respondents, a fractional factorial design was used, resulting in 20 profiles, including four holdout profiles used for validation purposes (see, Hair et al. 1998). No problems of unrealistic combinations of profiles were found. The full-profile method of presentation was used, and respondents rated the profiles on a 10-point scale according to how likely they were to choose a particular BCom. Students were asked to assume that they fulfilled the entry requirements for each university and that the courses were similar on other variables such as the number and range of units and entry requirements. In addition to the conjoint experiment, students were asked to rate the importance of 30 possible variables in course choice. In addition, respondents were asked for their demographic and situational details. Pilot testing of the questionnaire ensured that the instrument was appropriate.

Sampling Procedure

To simplify the design of the conjoint experiment, it was assumed that students had already made their choice of course. Consequently, students were included in the survey who were enrolled in a BCom at one Australian university, and who were enrolled in their course either on-campus or off-campus. Further, this university had a long tradition of distance education and dual mode delivery. The latter meant that even school leavers enrolled on-campus, had some experience of using distance learning materials. Therefore, those surveyed were in a position to distinguish between different studies modes.

Questionnaire Administration and Response Details

The questionnaires were mailed to students with a covering letter. Students were free to respond anonymously if they wished. No follow-up of non-respondents was undertaken. Five hundred and fifty-five usable questionnaires were returned. This represented a response rate of 30% after allowing for non-deliverables. Three cases with substantial missing data were removed leaving...
The demographic profile of respondents matched those of students enrolled in the BCom at the university with the exception that proportionately more females responded to the questionnaire. Of the 552 respondents, 71% were enrolled on-campus; 42% were males; 68% were enrolled full-time; 26% were in the first year of their course, 40% were second years and 34% were third (final) years; and 49% of on-campus students were full-fee paying Asian students, largely from South-East Asia. The remaining were Australian (domestic) students.

General data coding, screening and missing data analyses were conducted as per the recommendations of Tabachnick and Fidell (2001). The hypothetical institutional profiles were analysed using the conjoint procedure in SPSS. Post hoc segmentation was performed using both hierarchical and non-hierarchical cluster analysis.

**TABLE 1**

<table>
<thead>
<tr>
<th>Attributes and Levels</th>
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<tr>
<td>University Brand#</td>
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<tr>
<td>University A</td>
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<td>University B</td>
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<td>University C</td>
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<td>University D</td>
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# Real university names were used in the actual study and a location was specified for each university to distinguish between its different campuses.

**FIGURE 1**

Relative importance of attributes in university choice

552. The demographic profile of respondents matched those of students enrolled in the BCom at the university with the exception that proportionately more females responded to the questionnaire. Of the 552 respondents, 71% were enrolled on-campus; 42% were males; 68% were enrolled full-time; 26% were in the first year of their course, 40% were second years and 34% were third (final) years; and 49% of on-campus students were full-fee paying Asian students, largely from South-East Asia. The remaining were Australian (domestic) students.

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**FINDINGS**

Model estimation and goodness of fit were examined. Respondents with low correlations on the estimation model and/or low correlations on holdouts (“low” being defined as below .60) were removed from the sample, leaving 403 respondents.

The results shown in Figure 1 indicate that all three attributes were important in choice. The most important attribute was study mode which had an importance of 41%. The second most important attribute was tuition fees with 32%. While still important in choice, the least important attribute was University at 27%.

Segmentation analysis of the data was conducted a priori and post hoc. For the a priori segmentation, the analysis was conducted by mode of attendance (on or off-campus enrolment) and by resident status (domestic or international). As international students were not able to enrol off-campus, the segmentation by
enrolment mode is restricted to domestic students, and that by resident status is restricted to on-campus enrolled students, only. For mode of attendance segmentation, study mode remained the most important attribute. However, the hierarchy of importance changed with “university” rated the second most important attribute for on-campus students ahead of tuition fees. The difference in the importance of the university attribute was significant (p<.001). There were differences also in part-worths for study modes and universities. Those for study mode were in the expected direction with on-campus students having a significantly higher mean for face-to-face study compared to off-campus enrolled students, and significantly lower means for web-based and print-based study. As indicated, there were also significant differences between attendance groups in the part-worths for universities. There was no difference in the part-worths for tuition fees between the two segments.

The second segmentation was conducted by resident status. While study mode remained the most important attribute for international students, it was equal to importance with tuition fees. Study mode was significantly less important to international students (p<.001), and tuition fees (p<.01) were significantly more important. There was no significant difference between the two groups on the importance of university. The difference in the importance of tuition fees is consistent with the significant difference in the part-worth for tuition fees. In contrast to the first segmentation, there were fewer differences in the part-worths for study modes and universities between the segments on resident status. However, the two segments did differ significantly in their utility for Universities B and C (both p<.01).

In summary, for the a priori segments, both attendance mode and resident status were useful ways of segmenting the data in that they revealed differences in the importance of particular study modes and universities to on versus off-campus students, and differences in the importance of tuition fees to domestic versus international students. In both segmentations, study mode remained the top-rated attribute although for international students, the tuition fee attribute was equally important.

The post hoc segmentation was conducted in four steps: (1) an initial hierarchical cluster analysis on importance scores; (2) cross-validation using a non-hierarchical cluster analysis; (3) examination of the predictive accuracy of the cluster solutions using discriminant analysis; and (4) profiling of the clusters on demographic variables. To perform the initial hierarchical cluster, the data were divided randomly into two subsets as recommended by Everitt, Landau and Leese (2001). The first subset (n=202) was analysed through SPSS using the Ward method and squared Euclidean Distance. Inspection of the agglomeration coefficients suggested that a three-cluster solution represented the best solution. All three clusters were of practical consequence ranging from 30% to 40% of the sub-sample. Each cluster was distinct on one of the importance scores. Members of Cluster 1 placed their highest importance on university (46.5%), although study mode was also important (32.9%). Cluster 2 members placed their highest importance on tuition fee (56.2%), and for Cluster 3 members, study mode was their most important attribute (60.9%).

A three-cluster solution from the non-hierarchical analysis was obtained by analysing the second subset of students (n=201) using the K-means method. The cluster centroids created through the hierarchical cluster were used as seeds for the K-means clusters. The non-hierarchical clustering produced clusters of similar size. Each cluster had a very similar profile on the three importance scores to one of the hierarchical clusters.

Both cluster solutions were subject to a discriminant analysis to assess their predictive accuracy. (The details of these analyses are not reported in this paper.) The analysis of both solutions performed creditably in predicting group membership using the criterion suggested by Hair et al. (1998). However, as the discriminant function for the K-means solution did a better job of predicting membership of all three clusters, this solution was chosen for the purposes of profiling the three clusters. The K-means clusters were profiled on various demographic and other variables. Chi-square tests showed significant differences between clusters on five variables: mode of attendance, attendance type, work status (whether in paid work), resident status, and fee-paying status. Other variables such as age, gender and parental status were not significant.

Cluster 1 (high importance of university) included respondents who were proportionately more likely than those in Cluster 2 to attend on-campus, work for pay, be domestic students, have no dependants, and be in the younger age group, that is, 25 years or less. Despite the findings of the a priori analysis that international students were more price sensitive, 39% of international students were grouped also in this cluster. Cluster 2 (high importance of tuition fees) was distinguished from the other groups in that respondents were proportionately more likely not to be in paid work and to be international students. Nineteen per cent of off-campus respondents were also in this cluster. In addition, more members of this cluster reported having dependants. Cluster 3 (high importance of study mode) appeared to be the most distinctive group. Compared to Clusters 1 and 2, Cluster 3 respondents were proportionately more like to be enrolled off-campus, attend part-time, work for pay, be domestic students, and pay domestic full-fees or make HECS payments in advance. Clusters 2 and 3 differed substantially on four variables: mode of enrolment, attendance mode, work for pay and residential status. However, similar proportions in both clusters had dependants and were in the two older age groups.

**DISCUSSION**

The first research question asked about the trade-offs respondents make between attributes in their institutional choice. In this study, all three attributes were found to be important in choice. In descending order, the important variables were study mode, tuition fee and university.

The finding on the importance of study mode is a notable departure from the literature. Previous studies of university choice largely disregarded this attribute. Off-campus or flexible study modes were found to have some importance to non-school leavers wishing to enrol in a university course (Robyler 2000). However, no previous studies have investigated the importance of study mode, more generally, to traditional university students. The importance of study mode was driven mainly by the extent to which respondents perceived on-campus and off-campus modes as polar extremes. For non-school leavers, on-campus study may be an extreme option because of the situational constraints faced by them (in terms of distance, and work or family commitments). Conceivably, these constraints mean that such students simply cannot attend on-campus face-to-face and, therefore, cannot trade-off study mode for other attributes such as tuition fees and university. An additional explanation provided in the literature is that some students may prefer the independence and flexibility provided by off-campus study modes (see, Wallace 1996). However, while the importance of study mode to non-school leavers may be well understood, no comparable explanation for on-campus preference is provided in the literature. Why do on-campus students perceive on-campus and off-campus as extreme choices when they face no situational barriers that might prohibit them from studying by off-campus modes? This is a particularly interesting question given the moves to extend “opportunities” for traditional students to learn by means that are more independent and with the developments in online
learning that substitute for on-campus, face-to-face classes. The results of this study suggest that for many traditional undergraduates, being able to study face-to-face on-campus was more important to them than the university they would attend or the tuition fees they had to pay. A further finding on study modes was that respondents distinguished only marginally between web-based and print-based study. That is, in aggregate, web-based study did not increase the attractiveness of the off-campus mode to students who wanted to study on-campus, and slightly decreased its attractiveness for students wishing to study off-campus. This finding is contrary to the trends in higher education towards offering more ICT-intensive delivery.

The second most important attribute on average to students was tuition fee. In this study, the results suggest that respondents were only moderately price sensitive in choosing between institutions in which to study a business course. International students paying full fees were significantly more price sensitive than domestic students. This suggests that the level of tuition fees will increase in importance as a decision criterion for Australian students. The university attribute was only marginally less important than tuition fees and still contributed substantially to the overall institutional preference of students. Clearly, some caution is required in drawing conclusions about the relative importance of the three attributes due to both the design of the conjoint and sampling issues, such as interaction effects, the inclusion of actual brand names for universities, and the extremity of values used to describe each attribute. However, there was no obvious and consistent bias in the design and sampling decisions that would have combined to produce the specific results.

The second research question was concerned with the degree of homogeneity of the sample. This analysis revealed that domestic on-campus respondents placed more importance on the university attribute and less on study mode and tuition fee compared to off-campus students. However, the two mode groups were equally price sensitive despite the fact that more off-campus students were paying HECS fees in advance. These differences in the HECS payment system may have been offset by the greater likelihood of off-campus students being employed full-time.

International students as a group placed less importance on study mode and more on tuition fee, and they were significantly more price negative and distinguished more between universities than did domestic students. However, despite these differences between segments, the hierarchy of importance, regardless of segmentation, remained largely the same. Study mode was still the most important variable although it was equal in importance to tuition fees for international students. University remained the least important variable with the exception of domestic on-campus students for whom it was narrowly more important than fees. Further, more international students placed their highest importance on the university attribute. Previous studies have found that international students place more emphasis on reputation and less on amenities than Australian undergraduates (see, Gatfield et al. 1999).

However, the segments in the a priori analyses were not homogeneous. Sub-samples were identified in the data from the post hoc segmentations that cut across both enrolment modes and residential status. Three clusters were identified based on the importance placed on one of the attributes, and were of relatively similar size and identifiable on several situational characteristics. (The largest segment was divided subsequently into flexible and classroom learners.) The cluster analyses revealed considerable heterogeneity within the a priori segments. For example, not all international students were concerned equally about tuition fees in making their hypothetical institutional choices. While 41% of undergraduate international students were in Cluster 2 (high importance of tuition fee), almost an equal percentage were in the cluster whose members placed their highest importance on University. Similarly, membership of the post hoc clusters cut across enrolment...
mode with some off-campus respondents being in the “tuition fee cluster” and domestic on-campus respondents represented in all three clusters.

**SUMMARY AND CONCLUSIONS**

Shifts by universities towards alternative delivery of their academic programs, particularly through online methods, assume an understanding of the importance of study modes to students that is untested in the literature. The findings from the research were clear—study mode was the most important attribute in choice, assuming students had chosen their course of study. Tuition fees were second in importance, followed by university. All three attributes were of considerable importance. Undergraduates preferred face-to-face study and had a marginal preference for print-based study over web-based study. They were relatively insensitive to tuition increases. They distinguished only marginally between three of the four universities.

The results for the a priori analyses were consistent with those found for the aggregated data, that is, study mode was the most important attribute in choice regardless of the basis of segmentation. There was some variation in the importance of tuition fees and university based on enrolment mode and resident status. For domestic on-campus undergraduates, university was more important than tuition fees. For international undergraduates, study mode and tuition fees were of equal, first importance. Study mode was the most important attribute. The importance of study mode was driven by the extent to which respondents distinguished between on-campus and off-campus modes. Study mode was important to students, regardless of their enrolment mode. These clusters were substantial in size, exhibited differential behaviour on attributes in institutional choice and were identifiable on several background variables. Each cluster cut across the segments defined by enrolment mode and residential status to reveal greater heterogeneity among students than was obvious from the a priori classification.

Two particular areas for theory development are suggested by the findings. The first is the need for theories of institutional evaluation and choice to explain how study mode interacts with other criteria such as reputation, fees and location. For example, theories about the investment benefits of higher education consider not only the degree itself, but also the experience of “rubbing shoulders” with elite students and staff. If students spend less time on campus and more time in independent study, how does this alter the benefits they derive and those for which they are prepared to pay? Related to this is a need for theories of university choice to consider study mode in relation to students’ motives for pursuing higher education. For example, a common observation in the literature about students’ motives is that they are becoming more instrumental in their approach to higher education. This instrumental “thesis” is used to explain why flexible modes might be important: students want to combine work and study, finish in minimum time and not be bothered with campus life (see, Levine 2001). However, an alternative perspective might be that, by investing in the on-campus experience, students may receive longer-term payoffs in terms of the contacts they make, the learning and results they achieve, and the prestige of being full-time, on-campus. That is, theories of university choice need to consider the relationships between students’ motives for choosing a course at university and the importance they place on attributes as study mode.

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