

The importance of credit transfer in the decision to undertake post-compulsory education: An exercise in experimental choice analysis.

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Abstract

The increasing value that education provides to the economy and society is now well established (Samier, 2000; McKenzie, 1999) and makes understanding the motivations for “buying” formalised learning significant. From a supply-side perspective, providers must respond in a strategic manner to an increasingly complex environment. Reductions in Government funding have been accompanied by increased competition between providers for both students and funding. The result has, in part, led to pressure to treat education as a ‘product’, increasingly focusing on factors such as institutional standing, product differentiation and niche markets, relentlessly seeking new opportunities to achieve strategic objectives. Finally, there is the increased influence of stakeholders. From a demand-side perspective, the individual must be proactive in an environment where knowledge becomes rapidly obsolescent and workers are under constant pressure to up-grade their skills and knowledge throughout their working life.

This paper reports findings relating to the relative importance of a number of product attributes, such as cost and the extent of credit transfer, in the individual's decision to undertake post-compulsory education and training. The methodology utilised is experimental choice analysis which is a stated preference technique. This method combines an extensive iterative qualitative phase of data collection with a rigorous statistical technique to ultimately determine the marginal rate of substitution for the various product attributes.

1.0 Introduction

Education providers are shifting towards a more business oriented approach to education. This is largely due to the increasing value that education provides to the economy and society (Samier, 2000; McKenzie, 1999), along with a number of external forces pushing education providers in this direction. Universities, for example, have been encouraged to ‘market’ their product more aggressively in local and international markets (Craig-Lees & Wahid, 1997). From a supply-side perspective, education providers must respond strategically to an increasingly complex environment. Firstly, increased international competition is placing pressure on Australian educational institutions to perform at an international standard. Domestically, intensified rivalry between Australia's education institutions for both students and funding is also apparent, requiring heightened attention to institutional standing, product differentiation and niche markets in an attempt to seek new opportunities to achieve strategic objectives (Department of Education, Science and Training, 2004). Secondly, government funding per student has reduced so that existing practices can only be maintained by increasing funding from non-government sources (Australian Vice-Chancellors' Committee, 2003). Finally, students are

increasingly seen as clients, especially in a fee-paying culture, and student preferences are driving changes to academic programmes (Murdoch University, 1997; DEST, 2004).

In this context, education providers must develop strategies to stay competitive and maintain and increase their market share. To this end, whilst most growth has been in the number of domestic undergraduates, there is still significant potential for growth in the domestic postgraduate sector (DEST, 2004). Education providers themselves are able to set the fees for postgraduate courses in a much less regulated environment than that of undergraduate courses, making the postgraduate sector a significant source of potential revenue for organisations. It therefore appears that there is value in education providers focusing on creating postgraduate courses that are more attractive to students.

Rising demand for education has been associated with increased rhetoric about the importance of education as a vehicle to cope with the constant change that characterises the contemporary work environment (Shaw *et al.*, 2001; Maglen & Shaw, 1999; Dawkins, 1988). In this context, Australians increasingly perceive higher education as an effective future investment (DEST, 2004). This is evidenced in the increasing demand for postgraduate education (Murdoch University, 1997; Australian Bureau of Statistics, 2004).

Thus, there is a need for more informed marketing of postgraduate course offerings since the success of efforts to market any product depend, in part, upon a sound understanding of the factors that influence the pre-purchase decisions. Accordingly, understanding the motivations for “buying” formalised learning products is crucial. Moreover, given the trend towards ‘life long learning’ (McKenzie, 1999), comprehending the impetus for repurchase behaviour should prove particularly useful at a policy making level. This paper presents initial results of a study that draws upon the marketing discipline to more fully understand the drivers of student ‘purchase’ and ‘re-purchase’ decisions.

The paper itself is comprised of six parts. Part two presents a synthesis of the literature pertaining to the concept of lock-in and loyalty programs and specifically addresses these concepts in the context of education. In part three the paper explores an empirical approach known as choice modelling, which is used to examine the consumer’s decision making process. The experimental design of this choice experiment is analysed in part four and the findings are presented in part five. Subsequently, part six proffers a number of suggestions for future research before ending with some brief concluding remarks.

2.0 Literature Review

As competition increases, or as market growth decreases, organisations are more likely to focus on retaining existing customers. A persistent theme in this strand of literature suggests that customer retention is a reliable strategy for achieving superior performance (Fornell & Wernerfelt, 1987; Peters, 1988; Reichheld & Sasser, 1990). Interestingly, consumers who are ‘locked-in’ will ultimately engage in repurchase behaviour. Lock-in arises when switching costs become so high that it is too costly for the consumer to change over to an alternate product/service (Shapiro & Varian,

1999). Lock-in confers an extensive competitive advantage on organisations that know how to take advantage of it, and arises in two broad forms. Firstly, there is a dimension to lock-in that emanates from ‘learning and habituation’ (Barnes *et al.*, 2004), which has been termed ‘behavioural lock-in’. Notably, behavioural lock-in does not arise through a firm’s marketing strategies, rather, it simply evolves from the process of purchasing and consuming a product/service with a particular supplier.

Alternatively, ‘artificial lock-in’ can be achieved through implementing marketing strategies that deliberately increase customers’ switching costs and hence encourage repurchase behaviour. Loyalty programs are becoming an increasingly effective strategy of lock-in within this genre of strategy. In this instance, sellers reward their customers for repeat purchases in order to gain customer loyalty. Essentially, the incentives from the loyalty program become a product attribute that adds value to the offering. The challenge for marketers is to identify those incentives that the customer values, thereby, can potentially creating switching costs.

There are two mechanisms by which loyalty programs create switching costs. Firstly, if a customer changes their supplier they may forfeit certain credits. Secondly, there are certain benefits, such as preferential service, that are based on cumulative usage. In this case, the switching costs would be losing these benefits (Shapiro & Varian, 1999). Loyalty programs provide a vehicle for firms to manage switching costs. Firms are able to alter the structure of artificial lock-in to prevent customer defection. More specifically, examining consumption patterns and preferences can reveal when to implement particular incentive programs in order to induce higher switching costs and ultimately encourage repurchase behaviour (Lee *et al.*, 2001).

Several educational institutions have employed loyalty programs in an attempt to ‘lock-in’ their undergraduate students to complete postgraduate education at the university (Black, 2004); that is, to encourage students to engage in repurchase behaviour. More specifically, reducing a postgraduate student’s study load by offering ‘credit’ in certain subjects to graduates of the particular university, is a widespread practice. Therefore, by employing ‘credit’ as a proxy for loyalty programs (artificial loyalty) it will offer us one approach to empirically analyse the significance of these programs as a marketing strategy to retain undergraduate students. More specifically, in the context of this research we use the term ‘credit’ to represent the number of subjects that a graduate will not have to complete in a postgraduate course if they choose to continue at the same university.

Numerous retrospective studies have purported to analyse consumer behaviour in the education sector (Kilpatrick, 2001; Soutar & Turner, 2002). However, the existing studies of educational choice (see, for instance, Dubas & Strong, 1993; Moogan *et al.*, 2001; Tarasewich & Nair, 2000; Zufryden, 1983), do not consider the trade-offs between different product offerings that individuals make during the decision process.

A technique that offers a more realistic insight into the student’s decision to engage in repurchase behaviour would enhance our comprehension of consumer behaviour. More specifically, a study which employs an approach that enables empirical analysis of the influence of current retention strategies, namely loyalty programs, on the undergraduate student market as they pertain to postgraduate education appears to be

warranted. Thus, our research strives to address the question, ‘Do loyalty programs (i.e. credit transfer) influence the individual’s decision to undertake post-compulsory education and training?’ This paper now examines the workings of Choice Modelling, before presenting some empirical results.

3.0 Methodology: Conjoint Analysis and Choice Modelling

Given the level of complexity inherent in both the ‘product’, which is postgraduate education, and in the individual’s decision-making process, it seems that some form of multi-variate analysis (MVA) will be a useful vehicle for addressing the research question. MVA is defined as ‘[a]ny simultaneous analysis of more than two variables...’ (Hair *et al.*, 1998). More specifically, a methodology that can measure the influence of several product attributes, relative to the graduate’s decision to engage in further education would reside within this group of techniques.

According to Hair *et al.* (1998), conjoint analysis is a multivariate technique employed to comprehend the way in which respondents form preferences for products, services, or ideas. Wittink *et al.* (1994) recognise that conjoint analysis differs from alternate multivariate techniques in that it takes a decompositional approach, it is flexible in terms of relationships between dependent and independent variables, and has the capacity to estimate utilities at the individual level. Consistent with consumer decision theory, consumers make decisions based upon the product’s attributes (Kaul & Rao, 1995). The aim of conjoint analysis is to statistically unbundle these attributes and assign the part-worth utilities to them.

According to Carroll and Green (1995), Choice Modelling (CM) has its origin in conjoint analysis, which is derived largely from the theoretical contributions of Luce and Tukey (1964), Kruskal (1965), Roskam (1968), Carroll (1969; 1973) and Young (1972). Interestingly, CM was introduced into the marketing literature by Louviere and Hensher (1982) and Louviere and Woodworth (1983). In recent years, several applications have aimed to estimate the value of environmental and recreational goods (see, for instance, Opaluch *et al.*, 1993; Adamowicz *et al.*, 1994; Rolfe & Bennett, 1996; Boxall *et al.*, 1996; Adamowicz *et al.*, 1998; Hanley *et al.*, 1998; Morrison & Bennett, 2000). However, there is a limited number of this type in the education sector.

From an academic perspective, CM is a valuable research technique that may be used to empirically examine theoretical hypotheses of choice behaviour (Huybers, 2003). More specifically, it can be applied to determine the influence of particular attributes on consumer choice. From a management perspective, CM can also be of value. For instance, education providers can use this method to analyse the attractiveness of their ‘product’, namely postgraduate courses, to existing and new target markets. The perceived relative importance of postgraduate education and its attributes can be determined using this method.

4.0 Experimental Design of this CM

This research generally followed the experimental design process used by Lockwood and Carberry (1998), involving focus interviews, focus groups and survey pre-testing.

It was anticipated that this process would reveal the relevant attributes of the 'product', a postgraduate course.

A group of *a priori* attributes and levels were developed from discussion with undergraduate students from various schools and year levels at regional and metropolitan campuses of a selected university. More specifically, a total of 20 semi-structured interviews were conducted with students to ascertain the appropriate product attributes. To refine the attributes and levels, two focus meetings with additional students were subsequently conducted. The attributes considered to be most significant to potential buyers of postgraduate education included the price of the course and the number of subjects received on credit in the course. A survey was designed using the information obtained in the interviews and focus groups. To ensure that the choice experiment and accompanying socio-economic questions in the survey captured the pertinent information in a suitable format, a pilot sample of 25 was distributed. Ultimately, the survey sample of the study comprised 274 respondents.

Notwithstanding the potential problem of colinearity between price and payment method, the price attribute was the least difficult to communicate in the choice task. The survey specified that the price of the course was the amount paid by graduates per annum, to complete the postgraduate course presented in the scenario. In addition, the survey specified that the course had a deferred payment option (HECS/PELS). The price range was developed by, initially, taking the lowest and highest price values that students were prepared to pay per year for a postgraduate course [\$5,000 to \$20,000]. The ultimate range was set just outside these two values in line with the observation by Hair *et al.* (1998) that levels should be expanded to encourage a choice response. Thus, \$4,500 per year was taken as the lower bound and \$20,500 as the upper bound. Six evenly spaced levels were selected to develop the stimuli and were confirmed by the price points commonly mentioned by participants.

The second attribute was the number of subjects that existing graduates of the university would gain as credit if they complete postgraduate studies at the particular university; that is, the student would not have to complete particular subjects if they were a former student. The credit subject attribute proxies a hypothetical loyalty program implemented by the university. The 'credit' range, being the number of credited subjects, was developed from the feedback by participants in the focus groups. The minimum was 'zero' credit subjects, as some students indicated that credit would not act as an incentive to undertake a postgraduate course at the university. Alternatively, other students claimed that the more credit subjects the university offered the more attractive the course would become. Nevertheless, when developing the range of this attribute it was important to consider that the hypothetical course would be of one year's duration, comprising of eight subjects, and the range would need to evoke a response and remain plausible. Accordingly, the range began at 'zero' and again six evenly spaced levels were used to maintain reasonable balance across attributes and minimise potential biases from this source (see, for instance, Wittink *et al.*, 1994).

The most important and relevant attributes employed in the choice sets were only two of a number of identified influences over the students' decision to 'buy' a

postgraduate course. Eight other product attributes were commonly significant to respondents. For the choice experiment to effectively manipulate the two selected attributes, these remaining attributes were presented to respondents and held constant at the time of the survey.

5.0 Findings of this CM

Coding of variables and the base-case scenario

In order to develop a model of buyer behaviour in the current context, the choice attributes were coded for regression. In this instance, the *status quo* or base option implied that the respondent would not be prepared to buy either of the options presented. Clearly, if the participant chooses not to buy either option, they pay nothing and they do not receive any subjects on credit. Thus, the base-case scenario was defined as a zero price and zero subjects received on credit.

The coding of the attributes is summarised in Table 5.1.

Table 5.1: Definition and Coding of Variables

Variable/Constant	Definition	Coding
PRICE	The price (\$) of the course per annum.	\$4,500; \$8,000; \$11,000; \$14,000; \$17,000; \$20,500
CREDIT	Number of subjects received as credit.	0, 1, 2, 3, 4, 5
C₁	Alternative Specific Constant [ASC]	Constrained to be equal across V ₁ and V ₂

A basic multinomial logit (MNL) model was developed using equation 5.1. The specialised software package ‘LIMDEP’, which is designed to analyse limited dependent variables, was used to conduct the analysis. The following specifies the indirect utility functions specified for the basic linear model:

$$\begin{aligned}
 V_1 &= C_1 + \beta_1 \text{Credit} + \beta_2 \text{Price} \\
 V_2 &= C_1 + \beta_1 \text{Credit} + \beta_2 \text{Price} \\
 V_3 &= \beta_1 \text{Credit} + \beta_2 \text{Price}
 \end{aligned}
 \tag{5.1}$$

A t-test of the two ASCs in the basic linear model revealed no significant differences at the 1% level. Accordingly, the ASCs were constrained to be equal across V₁ and V₂. The resulting linear model is henceforth referred to as Model 1.

The coefficients for the credit and price attributes in Model 1 proved significant at the 1% level or better, with signs that met *a priori* expectations. The model explains approximately 17% of the variation in the data, which is regarded as adequate for this type of model. According to Hensher and Johnson (1981), Rho 2 values of between 0.2 and 0.4 are typically regarded as a good fit of the data in choice analysis.

Moreover, a chi-square statistic can be derived by employing equation 5.2, and to comment on the overall significance of the model.

$$\chi^2 = -2 [Lr - Lu] \quad [5.2]$$

In this instance, the chi-square statistic exceeds the critical value of 9.210¹, thus the null hypothesis that the model is insignificant is rejected. Additional details of the model are reported in Equation 5.3.

An assumption of independence applied to irrelevant alternatives [IIA] underlies the MNL model. Therefore, this type of study requires that violations of the IIA property be tested. In this instance, the Hausman and McFadden (1984) test was employed. Basically, comparisons are conducted between a full multinomial model and a model with an alternative removed. If the parameter estimates do not vary significantly across the two models, the IIA assumption holds. In this case, the test indicated that no significant violations of IIA occurred at the 1% level.

The theoretical validity of the MNL models is founded on two observations. Firstly, the overall significance of the models, generated using chi-square, supports the theoretical validity. Secondly, the degree to which independent variables meet *a priori* expectations and are significant can also act as a means of assessing theoretical validity (Morrisson & Bennett, 2000). Notably, the basic linear model fulfils these criteria.

$$\text{Model 1} = -0.852 - 0.128\text{E-}03(\text{price}) + 0.335(\text{credit}) \quad [5.3]$$

Model 1 indicated that the PRICE attribute was negative and significant. Put differently, increasing PRICE increases the probability of a student choosing the 'No Study' option. Conversely, the CREDIT attribute was both significant and positive. That is, increasing the CREDIT (subjects received on credit as a consequence of being an ongoing student of the university) decrease the probability of a potential student selecting the 'No Study' option.

6.0 Limitations, Future Research and Concluding Remarks

It is important to acknowledge that whilst several implications have emanated from our empirical analyses, a number of limitations exist. For instance, this study was confined to one university, thus, future research may draw a wider sample to gain a broader representation of the student market. Moreover, whilst this study employed 'credit' subjects to measure the effectiveness of artificial loyalty, it is important to note that there exists additional elements of lock-in, that circumscribe the graduate's decision to continue postgraduate education at the same university. From a marketing perspective, offering 'credit' to former graduates appears to be an effective strategic approach to retaining students. However, from a pedagogical perspective, this may raise several issues of concern. Finally, it is important to recognise that CM is a stated preference method. Therefore, data is collected in a hypothetical market, which does not offer certainty in actual choice behaviour (Diamond & Hausman, 1994).

¹ The critical value used here was $\chi^2_{\alpha=0.01}$. The degrees of freedom is equal to the number of restriction in the model, in this case 2.

In sum, this paper has applied some of the basic tenets of the marketing discipline to examine the drivers of individual choice to 'repurchase' in post graduate programs. Findings support the notion that individuals can be encouraged to repurchase by the application of appropriate 'loyalty programs'. Moreover, individuals trade-off such loyalty programs against price in their decision analysis.

These results offer education providers with a valuable insight into the decision-making process of students pertaining to postgraduate education. Specifically, analysis of the CM reveals that 'credit' acts as a significant incentive for graduates of the university to complete postgraduate studies at the particular university. This indicates that there may be some value in universities offering 'credit' in postgraduate subjects in an attempt to retain graduates or structuring undergraduate offerings to better facilitate this option. Alternatively, education providers may place a focus on developing postgraduate courses that better integrate and recognise undergraduate learning in an attempt to enhance their postgraduate education customer base.

Notably, this study was limited to analysing the influence of only two product attributes, namely price and credit transfer, on the student's decision to engage in repurchase behaviour. Future research may gainfully employ the basic linear model to further investigate the student's decision-making process. More specifically, various socio-economic variables of the respondents could potentially be included in the choice experiment in an attempt to identify the influence of factors such as age, gender, and location on the student's purchase decision. Further, empirical evidence suggests that a customer's continued patronage is an expression of their satisfaction with the service (Ballantyne, 1992). It may be enlightening to examine the possible links between satisfaction and repeat purchase in this context.

The current study related particularly to post-graduate education, but could also be applied to investigate the VET decision context. More specifically, there is ample scope to utilise CM in an attempt to determine the individual's willingness to pay in the context of alternative education products. For instance, identifying the trade-offs made for particular training programs would prove particularly useful in assisting organisations implement successful training programs.

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