

## RESEARCH ARTICLE

## Attribute Prioritization in Discrete Choice Experiment: Challenges and Suggested Approach in a study on Malaysian Islamic Finance Talent Job Choice

Abd Ghaffar Adedapo Alagabi<sup>1</sup>, Abdul-Halim Abdul-Majid<sup>1</sup>, Rosemaliza Abd Rashid<sup>2</sup>

<sup>1</sup>*School of Business Management, College of Business, Universiti Utara Malaysia, Sintok, 06010 Kedah, Malaysia.*

<sup>2</sup>*Islamic Business School, College of Business, Universiti Utara Malaysia, Sintok, 06010 Kedah, Malaysia.*

### Abstract

There has been an increase use of Discrete Choice Experiment (DCE) by researchers in the field of Human resources management. DCE is a quantitative technique that quantifies values placed on non-market goods, services or policies through the analysis of choices made among a combination of attribute and attribute levels presented in hypothetical experiment questionnaires. Attributes are cogent in DCE studies; hence, the first step in DCE studies is the selection and prioritisation of attributes. There are calls for caution in this stage to ensure valid research outcomes, however, scanty attention has been given to this important stage. Even though researchers have adopted qualitative techniques in the prioritisation of attributes for DCE, these are fraught with weaknesses. Issues such as subjective bias of the researcher and lack of statistically efficient outcomes because of small sample use, have been reported. More so, contextual issues such as nationality and other differences in survey population has necessitated a need to employ a more rigorous approach in prioritisation of attribute in DCE. It is against this background that this study introduced relative importance index (RII) in graduate talents' preference for job and organisation attributes in the Malaysian Islamic finance industry. Stratified sample was employed with the administration of 5point Likert scale questionnaire to investigate respondents' preferences among 12 selected job and organisation attributes. The result of this study showed that all selected attributes had  $RII > 0.5$  and could all be added in the experimental design. This study could help researchers in mitigating identified challenges in qualitative methods.

**Keywords:** *Attribute prioritisation, Discrete Choice Experiment, Relative Importance Index, Talent job choice.*

### Introduction

Discrete choice experiment (DCE) as an attribute driven quantitative research analysis technique used in eliciting preference or choice of products, services or policies has recently gained importance in the field of human resources [1,2]. DCE analysis technique is grounded on random utility theory and the theory of consumer behaviour [3,4]. The theory underpinning the technique is based on three axioms which states that individual consumer's preference is complete, continuous and monotonic [5].

This implies that individuals use compensatory decision-making processes and take cognizance of all available information in making decisions [6]. Individual goods, services or policies are valued by consumers

based on the attributes they possessed. In DCE, researchers estimate values of non-market goods and services by observing the choices made by respondents in a combination of alternative attributes and attributes levels composition given a set of experimentally designed hypothetical situations [7]. It is assumed that respondents choose alternatives with highest utility score by comparing levels of attribute [8]. Thus, attributes in a DCE study is cogent for the validity of study outcome [9].

For any good, service or policy of concern, there is always a plethora of attributes to be considered [10]. Albeit the default assumption of a DCE study is that all attributes are important and respondents

consider all attributes presented in studies; extant literature have identified different ways respondents may deviate from the assumption [11,12]. These include; the use of cognitive shortcuts to reduce task complexity, integration of attributes in nonlinear ways [13], or intentionally ignoring some attributes in a DCE survey [6,14,15].

This is because there is a limit to the amount of information respondents can process [6], and having too many attributes could make the experimental design too complex and cognitively challenging. Thus, respondents employ simple heuristics or non-compensatory decision strategies. This non-compensatory decision behaviour negates the continuity axiom of consumer behaviour, make the capturing of conventional utility function challenging, violates the calibration of marginal rate of substitution, as well as, the estimation of willingness to pay [6,16].

Also, incorporating all attributes will be more than the parsimony requirement a DCE study can accommodate [17] and could involve attributes of which respondents attach low preference. This may lead to, among other challenges, the issue of attribute nonattendance (respondents ignoring one or more attributes in a DCE) that has gained wide attention in recent literature from which biased estimate could be deduced [6].

Therefore, it is a necessary requirement to select, reduce and prioritise specific number of attributes that not only fits the standard requirement of a DCE but includes attributes that are of highest possible preference of respondents [18] to ensure accurate research outcome and guide policy implementations [1]. According to Hensher et al. [19], the challenges of ensuring relevancy of the subset attribute selected is a limiting factor in DCE. In HR DCE studies, the number of attributes used has been between 5 and 7 for model parsimony and statistical efficiency.

However, there is a dearth of studies highlighting how the process is efficiently carried out [21,7]. In line with the premise that attribute selection and prioritisation in a DCE is driven by the perception of the target population [20], extant literature has adopted various techniques in achieving this.

These are mainly qualitative techniques such as; literature review, theoretical arguments, expert opinions, interviews and focus group discussions [22, 2]. Abihiro et al. [1] and Mangham et al. [9], argue that these qualitative methods are best suited for attribute selection in DCE studies because they represent the perceptions and opinions of the beneficiaries. Nonetheless, these methods have been identified to be fraught with weaknesses [23].

Qualitative methods are limited by subjective bias because due to the use of small sample size they are not representative of the general population. Hence, they can only generate information that reveals complexities and similarities and not counting opinions to reflect the target population [20].

Also, Identification, selection and prioritisation of attributes in DCEs requires rigorous iterative testing and refining to ensure they are perceived and interpreted in the same way by all respondents in post design stage of studies [24]. Hence, because of the identified weaknesses in the qualitative methods, there have been calls in literature for the use of quantitative technique which use larger statistically representative samples. This is expected to minimise incidence of subjective bias, especially in the prioritisation stage.

Furthermore, researchers should be very thorough in the identification, selection and prioritisation of attributes in DCE because of different contextual challenges [9]. These could be differences in nationality, for example, it is more challenging to conduct DCE in developing country such as Malaysia. It is even more challenging when the surveyed population (such as talents in the Islamic finance industry) is new to DCE questionnaire [9].

Also, the possibility of apathy to hypothetical scenario by respondents could be another challenge. Hence, there is a need to have depth understanding and consideration of target population's orientation and experiences [20]. Therefore, it is a necessary requirement for researchers to take great caution in ensuring that final attributes selected and prioritised are context relevant and appropriate.

Against this background, the aim of this paper is to apply a suitable quantitative technique that mitigates incidences by accommodating a larger sample and systematically calibrate the relative importance of attributes to be prioritised for the post design stage design in DCE.

This will aid researchers in getting better insight on average opinion of surveyed population to ensure attributes selected for the choice experiment are relevant with minimal subjectivity bias. The study was carried out in Malaysia to assess the suitable and relevant organisation and job attributes that determine the job choice of talents in Malaysian Islamic finance graduate talents. This is in a quest to calibrate the job choice determinants among the plethora of job and organisational attributes in the Malaysian Islamic finance industry which is currently experiencing severe current talent crunch.

## Methodology

### Attribute Selection and Prioritisation

The first step in a DCE is the selection and prioritisation of context specific and relevant attributes for the study. As suggested by [9], it is a necessary requirement for attribute selection and prioritisation to be carried out through a thorough and exhaustive iteration process.

This is usually done by developing attributes from both secondary and primary data. In selecting and prioritisation of attributes for this study, an initial compilation of fifteen (15) attributes was done from extant study after which it was later reduced to twelve from the result of focus group discussion. The attributes taken out were deemed irrelevant in the context of the study. Based on the list of attributes from the review of extant literature on talent job choice and focus group discussion, we introduced an analysis technique called Relative Importance Index (RII) for the prioritisation of attributes.

RII is a quantitative technique mainly used in construction engineering to calibrate the relative importance of risk factors in construction projects [25, 26, 27]. Studies by Aziz, [25]; Gunduz et al. [26]. Bari et al [28] etc have used RII to compute the degree of individual perceived relative importance on constructs that are subjective. Just as DCE, variables used in RII are derived from related studies in extant literature [29] and

then the identified variables are boosted with additional variables from focus group, interview or expert opinion. The list of variables is then prioritised through the assessment of RII. This is akin to the identification and prioritisation of attribute in DCE.

RII is used to calibrate the degree of importance of selected attributes by ranking them according to the mean value and standard deviation or in some instances, percentage of respondents rating the attributes. In recent times, perceived mean of importance attribute is used.

To compute RII the following equation is used:

$$\frac{\sum_{i=1}^{i=I} W_i X_i}{\sum_{i=1}^{i=I} X_i * I} \quad (0 \leq \text{MRII} \leq 1)$$

Where  $W_i$  is the weight assigned to  $i$ th response; for  $i= 1, 2, 3, \dots, I$ , respectively, and  $X_i$ , frequency of the  $i$ th response. Here  $I$  denote the maximum response value weight. Regardless of the Likert rating scale adopted, the RII or degree of perceived weight of importance is modified to be between the range of 1 and 0. Thus, the closer the rating of an attribute is to 1 the higher the perceived importance and vice versa.

### Sampling, Questionnaire Development and Administration

Survey administration was carried out through a face to face administration technique. This technique was chosen because of its predominance in literature, moreover it is acclaimed to yield the highest rate of response [30]. 150 respondents were chosen as the sample for this study from the population of final semester students studying Bachelor of Islamic Finance in six Malaysian universities.

This exceeds the recommendation by Hill. [31] on the adequacy of 10 to 30 respondents for a pre-survey questionnaire and it is within the range of 150 to 1500 sample size suggested by Orme, [32]. for studies in DCE or conjoint analysis. This is done to ensure the validity of the study. Six interviewers who have been well trained on the objectives of the study were recruited for the administration of the questionnaire. The questionnaire consists of two pages with three sections. The first two sections consist

of the cover page with brief introduction on the purpose and objective of the study, followed by the second section with demographic questions on age, gender and level of education. Five Likert scale rating was adopted. The scales were tagged from 'very low impact on job choice' to 'very high impact on job choice' on a scale dimension of 1 to 5.

## Results and Discussions

A response rate of up to 89 per cent was recorded during data collection. This was achieved because the questionnaire was made to be very brief (Consisting of only two pages) besides it was administered through a face to face interview [30]. Also, interviewers were given specific mandate to call the attention of respondents to information that is ignored. Twenty questionnaires were, however, rejected due to incomplete responses.

As such, out of 170 questionnaires administered 150 were deemed useful for analysis.

## Respondents Demographic Analysis

Respondents were grouped into three age cohorts of 19 - 25, 26 – 30 and 31- 35. Eighty per cent of respondents fall within 20 – 25 years old, 18 percent are within 26 – 30 years old; while only 2 percent falls within 31 – 35 years old. Forty percent of the respondents are male, while sixty percent are female. Seventy-two per cent of respondents are degree students while 28 are Masters Students. This is expected because degree students are more in number than masters students in the target population. The gender distribution also reflects the reality of the 'lost boys' in Malaysian tertiary institutions [32].

**Table 1: Summary Statistics of Demographic variables**

Gender	Degree and Masters		
	Frequency	(Percentage %)	
Age	Male	60	40
	Female	90	60
Education of education	19 - 25	120	80
	26-30	27	18
	31-35	3	2
Education of education	Degree	108	72
	Masters	42	28

## JARII Computation Analysis

In analysing the survey response, the JARII values were calculated with reference to equation (2.2). The result in Table 2.below confirms the initial focus group discussion result which showed that all attributes used in the study are very important. This is proven by DARII > 0.5 across all attributes used. Salary attribute is ranked first. This shows that the respondents still consider what they earn monetarily in a job above all other attributes. This is followed in ranking by job security and then coming third is job location. The least ranked attribute is opportunity to work or travel abroad.

However, it must be noted that the ranking is well dispersed across categories of attributes, with job attributes category ranked (Salary) 1, (Location of employer) 4, (career advancement) 5, Type of work (11) and (Opportunity to work and travel abroad) 12 in its fold, while organisation attributes ranked: (Training and development) 3, (Job security) 2, (Organisation donation) 6, (Family friendly work) 7, (Organisational size) 8, (Organisation profitability) 9 and (Safe working conditions) 10 . Based on this, both the job (objective) and organisation (subjective) attributes are highly important job choice influencing attributes.

**Table 2: Job -Attributes Relative Importance Index for Talents in Islamic Finance**

Category Name	ID	Attribute Label	≤2	3	≥4	JARII	Ranking
Job Attributes	1	Salary	3.4	12.7	84	0.87	1
	2	Type of work	2	19.3	78.6	0.81*	11
	3	Career Advancement	5.4	11.3	83.4	0.84*	5
	4	Location of employer	3.3	12.0	84.6	0.85*	4
	5	Opportunity to work or travel abroad	8.7	28.7	62.7	0.77	12
Workplace reputation	6	Training and development	1.4	12.0	86.7	0.85*	3
	7	Job security	7.3	15.3	77.4	0.86	2

Organisation Reputation	8	Organisation size	1.4	21.3	77.3	0.84	8
	9	Organisation Profitability	2	22.0	76.0	0.82	9
CSR Attributes	10	Family friendly work	8	12.7	79.4	0.84*	7
	11	Organisation Donation	3.4	14.7	82.0	0.84*	6
	12	Safe working condition	9.4	10.7	80	0.81*	10

\*JARII of attributes with equal weight is ranked according to the percentage of respondents scoring 4 and 5.

## Discussion and Conclusion

Discrete choice experiment (DCE) method, though a new approach used in eliciting preference or choice of products, services or policies, has been gaining popularity in the field of human resources in recent times. DCE involves the estimation of values of non-market goods and services through the observance of the choices made by respondents in a combination of alternative attributes and attributes levels composition given a set of experimentally designed hypothetical situations [1, 2].

Choosing suitable and relevant combination of attributes is the first step in DCE studies and it is cogent in ensuring the validity of study outcomes. Nonetheless, there are weaknesses in extant literature on how this is made and studies highlighting how this important step is efficiently carried out is scanty [21,7]. Most studies have adopted qualitative methods in the selection and prioritisation attribute.

However, these qualitative methods have been found to be inadequate and weak especially in the context where the study is carried out in a developing country; in a new industry or field and where hypothetical experiment like DCE is new to respondents or respondents have apathy for such [9].

This study sets out to ensure attribute selection and prioritisation of job and organisation attributes. Also, the study was carried out comprehensively and efficiently to address the contextual as well as relevancy and suitability gap that has been identified in extant literature. This is done using RII which is a quantitative method that covers a larger sample of the population. The method is expected to minimise post design challenges, most especially the issue of attribute non-attendance that has been increasingly mentioned in literature and enhance the validity of the research outcomes. The study

was done as part of a DCE process in Malaysia to select and prioritise suitable and relevant organisation as well as job attributes that could determine the job choice of talents in Malaysian Islamic finance graduate talents. This was driven by the need to attract talents in an industry experiencing dearth of talent is to assess job choice determinants among the numerous job and organisational attributes in the Malaysian Islamic finance industry [33,34].

The result showed that all job and organisation attributes selected are highly important in the elicitation of talent job choice. This is evidenced by all of them having RII values greater than 0.5. It revealed that job attribute such as: salary, location of employer and career advancement were ranked 1, 4, and 5 respectively while Job security, training and development, organisation donation were ranked 2, 3, 6 respectively.

This is important because the higher the RII value, the more important the attribute is. Hence, the relative values of the attributes in RII could be used to prioritise attribute to be finally employed in the experimental design of the DCE, without bias or ambiguity. This makes the RII to be more suitable compared to other methods used previously. Therefore, the procedure utilised in this study could enhance application of DCE especially in developing countries and other new contexts in selecting and prioritising attributes for DCE, attenuate the negative effects of respondents using simple decision strategies such as issue of attribute non-attendance as well as enhance the validity of study outcomes. However, in the absence of time and cost constraints, it is recommended to consider the results across strata such as gender, educational level, institutions etc[17].

Also, in the era of global talent crunch, it is recommended that further studies on job and organisation attributes selection and prioritisation studies should be done on graduate talent from other courses.

## References

1. Abihiro GA, Leppert G, Mbera GB, Robyn PJ, De Allegri M (2014) Developing attributes and attribute-levels for a discrete choice experiment on micro health insurance in rural Malawi. *BMC health services research*, 14(1): 235.
2. De Bekker-Grob, EW, Ryan M, Gerard K (2012) Discrete choice experiments in health economics: a review of the literature, *Health economics*, 21(2), 145-172.
3. Lancaster K (1996) A new approach to consumer theory, *Journal of Political Economy*, 74, 132–157.
4. D Mc fadden (1974) Conditional Logit Analysis of Qualitative Choice Behaviour. In *Frontiers in Econometrics*, Zarembka P (ed.). (Academic Press: New York).
5. Lagarde M (2013) Investigating Attribute Non-Attendance and Its Consequences in Choice Experiments with Latent Class Models, *Health economics*, 22(5), 554-567.
6. Alemu MH, Morkbak MR, Olsen SB, Jensen CL (2013) Attending to the Reasons for Attribute Nonattendance in Choice Experiments. *Environmental Resource Economics*, 54 (3), 333–359.
7. Vass C, Rigby D, Payne K (2017) The role of qualitative research methods in discrete choice experiments: a systematic review and survey of authors, *Med Decis Mak.*, 37:298–313.
8. McFadden D (2001) Economic Choices. *American Economic Review*, 91(3): 351-378.
9. Mangham LJ, Hanson K, Mc Pake B (2009) How to do (or not to do) ... Designing a discrete choice experiment for application in a low-income country, *Health policy and planning*, 24(2), 151–8.
10. Helter TM, Boehler CH (2016) Developing attributes for discrete choice experiments in health: a systematic literature review and case study of alcohol misuse interventions, *Journal of Substance Use* 21(6), 662–668.
11. DA Hensher (2010) Attribute processing, heuristics and preference construction in choice analysis, In *State-of Art and State of Practice in Choice Modelling*, Hess S, Daly A (eds). (Emerald Press: U.K).
12. Kaye-Blake WH, Abell WL, Zellman E (2009) Respondents' ignoring of attribute information in a choice modelling survey. *Aust J Agric Resour Econ*, 53(4): 547–564.
13. Gilbride TJ, Allenby GM (2004) A Choice Model with Conjunctive, Disjunctive, and Compensatory Screening Rules, *Marketing Science*, 23, 391–406.
14. Hess S, Hensher AD (2010) Using conditioning on observed choices to retrieve individual-specific attribute processing strategies. *Transp Res B*, 44(6), 781–790.
15. Scarpa R, Gilbride TJ, Campbell D, Hensher DA (2009) Modelling attribute non-attendance in choice experiments for rural landscape valuation. *European Review of Agricultural Economics*, 36: 151–174.
16. Campbell D, Hutchinson WG, Scarpa R (2008) Incorporating discontinuous preferences in to the analysis of discrete choice experiments. *Environ Resour Econ* 41(3):401–417.
17. Adam SU, Shamsudin MN, Sidiq SF, Rahim KA, Radam A (2013) Attribute prioritization in choice experiment pre-design: suggested method and application to solid waste management service improvement. *Journal of Energy Technologies and Policy*, 3(11), 291-298.
18. Scarpa R, Zanolli R, Bruschi V, Naspetti S (2013) Inferred and stated attribute nonattendance in food choice experiments. *American Journal of Agricultural Economics*, 95:165-180.
19. Hens her DA, Rose JM, Greene WH (2012) Inferring attribute non-attendance from stated choice data: implication for willingness to pay estimates and a warning for stated choice experiment design. *Transp J*, 39:235–245.
20. Coast J, Hor rocks S (2007) Developing attributes and levels for discrete choice experiments using qualitative methods *J Health Serv Res Policy*, 12(1), 25–30.
21. Kløjgaard ME (2012) Designing a Stated Choice Experiment: The Value of a Qualitative Process. *Journal of Choice Modelling*, 5(2), 1–18.
22. Auger P, Devinney T, Dowling G, Eckert C, Lin N (2013) How Much Does a Company's Reputation Matter in Recruiting? *MIT Sloan Management Review*, 54 (3), 79–88.
23. Coast J, McDonald R, Baker R (2004) Issues arising from the use of qualitative methods in health economics. *Journal of Health Services Research & Policy*, 9: 171–176.
24. Coast J, Al-Janabi H, Sutton EJ, Hor rocks SA, Vosper AJ, Swancutt DR, Flynn TN (2012) Using qualitative methods for attribute development for discrete choice experiments: issues and recommendations. *Health Econ*. 21: 730-741.
25. Aziz RF (2013) Ranking of Delay Factors in Construction Projects After Egyptian Revolution. *Alexandria Engineering Journal*, 52 (3), 387-406.
26. Gündüz M, Nielsen Y, Özdemir M (2013) Quantification of Delay Factors by Using Relative Importance Index (RII) Method for Construction Projects in Turkey, *Journal of Management in Engineering*, 29(2):133–139.
27. Muhwezi L, Acai J, Otim G (2014) An assessment of the factors causing delays on building construction projects in Uganda, *International Journal of Construction Engineering and Management*, 3(1): 13-23.
28. Bari NA, Yusuff R, Ismail N, Jaapar A, Ahmad N (2012) Factors Influencing the Construction Cost of Industrialised Building System (IBS) Projects. *Social and Behavioural Sciences*, 35, 689 –696.
29. El-Sayegh SM (2008) Risk assessment and allocation in the UAE construction industry. *International Journal of Project Management*, 26(4), 431–438.
30. Bateman IJ, et al (2002) (Eds.), *Economic Valuation with Stated Preference Techniques: A Manual*, (Edward Elgar, Cheltenham, U. K).
31. Orme BK (2006) *Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research*. (Madison, USA: Research Publishers LLC).
32. Tienxhi JY (2017) The Gender Gap in Malaysian Public Universities: Examining the 'Lost Boys'. *Journal of International and Comparative Education*, 1-16.
33. Malaysian International Islamic Financial Centre. *Insight: Human capital development sustaining the growth of Islamic finance*. (Kuala Lumpur: Bank Negara Malaysia Publications), 2013.
34. Aziz MI, Afthanorhan A, Awang Z (2016) Talent development model for a career in Islamic banking institutions: A SEM approach. *Cogent Business & Management*, 3(1): 1186259.