An Assessment of Students' Job Preference Using a Discrete Choice Experiment: A Postgraduate Case Study

ABSTRACT

Purpose: Using a discrete choice experiment (DCE), this study aims to better understand the job preference of postgraduate students studying at the Kwame Nkrumah University of Science and Technology-Institute of Distance Learning (KNUST-IDL), Ghana and also rank the attributes of a job they deem important.

Methodology: The research adopted a positivist epistemological design contextualised within an deductive approach and case study strategy. Primary survey data was collected from a stratified random sample of 128 postgraduate students with multi-sectorial career prospects. Sample students were subjected to a DCE in which their stated preferences were collected using closed ended questionnaires with twenty-eight pairs of hypothetical job profiles. Respondents' preferences from the DCE data were then modelled using the conditional logit.

Findings: The research reveals that: salary in the range GHC 2,800.00 to GHC 3,400.00 ($1=GHS 5.3); supportive management; very challenging jobs; and jobs located in the city were the top attributes that were significant and had the most impact in increasing the utility of selecting a particular job. Interestingly, jobs with no extra hours workload was not significant hence, had a negative impact upon student preferences.

Originality: This novel research is the first to utilise a DCE~~discrete choice experiment~~ to better elicit preference and trade-offs of postgraduate students in a developing country towards varying job characteristics that have an impact on their future employment decisions. Knowledge advancements made provide invaluable insight to employers and policy makers on the key criteria that should be implemented in order to retain the best candidate.

Key Words: Utility, preference, attributes, postgraduate students, discrete choice experiment

INTRODUCTION

Humans have the innate capacity to express their preferences based on certain characteristics of the subject matter at their disposal – and from these characteristics, individuals gain different utility. The selection of a 'job' or 'career' (terms that are herein used interchangeably) by a student is one of many decisions that may have an impact upon their future aspirations (Edwards and Quinter, 2011). Edwards and Quinter, (*ibid*) further assert that with the ever-increasing development in information technology (cf. Newman *et al.,* 2020) and the sudden rise of the post-industrial revolution (cf. Edwards *et al.,* 2017; Roberts et al., 2018; Aghemien *et al.,* 2020) and increasing job competition, career preference has become a complex science for individuals. To attract medium-to-long term employees, employers should focus on both monetary attributes and non-monetary attributes of a job (Demel et. al, 2019). Factors that affect career preference of an individual may be categorized into extrinsic, interpersonal and intrinsic or altruistic (Sibson, 2011). These categories include a plethora of variables including: an enjoyable working environment; good career opportunities; job security; ability to have a positive impact upon society; flexible hours of work; and a good starting salary. Some academics proffer that most employees focus primarily on extrinsic factors such as economic rewards while conversely, others suggests that employee career preferences are increasingly affected by intrinsic factors (Gallie *et al.,* 2012). However and hitherto, scant research investigation has been conducted in

most developing countries to uncover key considerations that lie behind an individual's career preferences using various job characteristics of a job. This area delineated upon requires urgent research attention to assist employers and policy makers who seek to attract and retain the best qualified candidate. Career factors and variables that influence a graduate's career preference are extensive and largely unknown within the context of a developing countries context. Yet, graduates are instrumental to economic development and prosperity in developing countries.

According to Arokiasamy (2013), the staff turnover rate in organisations is one of the most costly human resource (HR) challenges within developing countries. Consequently, employers who possess no prior knowledge about the graduate's preferences at the time of their employment risk increasing their organisation's labour turnover rate. This problem creates a major hurdle for employment organisations who seek to formulate appropriate HR policies (Rehman, 2012) despite having limited empirical evidence on the importance of different job characteristics on their graduates' job preferences. Sibson (2011) opined that to attract and retain the best students, industry and commerce should seek to better understand what students identify as important in a career because knowledge of such helps with efforts to retain highly valued staff. Authors such as Olamide and Olawaiye (2013) used simple ranking and rating data to conclude that the factors of environment, influence and opportunity affect graduates' employment choices when determining their career. The limitation of this research (ibid) is that, applicants generally look at the attributes that define the job evaluating each attribute 'individually' hence, using these methods fail to actually reflect respondent preferences when they are asked to rank a list of 'subjective' attributes (Demel et. al, 2019). Olamide and Olawaiye (2013) also failed to report upon students' preferences with regards to a given career attribute and attribute level. Consequently, their work (ibid) did not support the theory of 'random utility' which states that a respondent is assumed to choose the alternative that constitutes their highest priority (Lancaster, 1966). The theory further states that, consumers (i.e. graduates) derive utility not from goods *per se* but rather from the attributes or characteristics that the goods possess.

To address these knowledge gaps, this research uses the discrete choice experiment (DCE) to elicit respondents' job stated preferences and assess the range of attributes that impact upon their preferences. Moreover, the work also develops an apposite job preference model using Lancaster's (1966) random utility theory as the basis. DCE is primarily used where the understanding of preferences from an individual's behaviour is difficult to ascertain (Mangham and Hanson, 2008) and are generally used in health economics and transportation studies. This model developed and concomitant contributions to new knowledge, will prove invaluable to employers, policy makers and recruitment agencies who seek to formulate employment selection policies that augment retention levels.

EMPLOYEE TURNOVER AND RETENTION

An organisations' well-being depends on its employees and one challenge facing employers is employee retention which can adversely effect productivity performance and profitability when turnover is high (Arokiasamy, 2013; Agyeman and Ponniah, 2014). Rehman (2012) opined that, the negative effect of turnover may comprise tangible or intangible costs associated with development of new employees, distraction of job performance, delays to project programmes etc. To remain competitive, organizations must attract and retain the highest calibre talent (Kossivi *et al.,* 2016). The turnover and retention rates of employees vary from one employer to

the other due to employees' ~~the~~ individual preferences ~~of their employees~~. Labour turnover (cf. Booth and Hamer, 2007; Agyeman and Ponniah, 2014) can be categorized into environmental and organizational factors. Building upon the aforementioned, the Herzberg two factor theory model proposed that any factors which impact upon an employee's satisfaction or dissatisfaction may be termed as motivators (satisfiers) and hygiene (dissatisfiers) factors. Motivators are intrinsic factors that influence employees in an organisation whereas hygiene factors are extrinsic and include: job security; salary; and benefits – failure to incorporate these hygiene factors within a job role often leads to dissatisfaction and poor staff retention (Ball, 2003). Figure 1 reproduces the Hyzberg theory.

<Insert Figure 1 about here>

To reduce employee turnover rates, human resource management must comprehend factors which play a vital role in postgraduate students' retention. Ghapanchi and Aurum (2011) stated that: remuneration and fringe benefits; training opportunities; fair and equal treatment; and organizational cultures were contributing factors to retention and turnover.

Attributes that Influence Preferences of a Job
In an increasingly competitive global market (Edwards et al., 2017; Owusu-Manu *et al.,* 2019), the employability of the best graduates has become an important consideration that underpins commercial success or failure (Nwogu and Momoh, 2015). For the graduate, selecting the right job is perhaps the most important decision taken at the outset of a career because such could impact upon their life and any decisions they may take – such as buying a home, starting a family etc. (Olamide and Olawaiye, 2013). Nwogu and Momoh (2015) proffer that dissatisfaction with the nature of a job and/or job insecurity were stronger influencers for graduates to change jobs than dissatisfaction with pay. Sibson (2011) observed that nursing graduates place low priority on financial rewards and prestige but rather place more emphasis upon working and caring for people, and attaining equilibrium in their work-life balance. Demel et. al, (2019) observed that, salary and commuting distance had a positive and negative impact on postgraduate students' preferences respectively. Many employees attach importance to extrinsic factors such as pay, promotion prospects and other fringe benefits with some attaching low importance to training opportunities (Gallie *et al.,* 2012). Stebleton (2007) proposed numerous external factors that affect or influence students' career choices; these external factors include: political and economic considerations; previous work experience; and the influence of key individuals in a person's life. Edwards and Quinter (2011) suggested that gender and environmental reasons were the least influential factors that may affect career choice and suggested that, the environment in which an individual develops will invariably shape their interests but not directly influence choices made. ~~(~~Mangham and Hanson,2008, observed that ~~).~~ ~~T~~the attributes: opportunity to upgrade qualifications, provision of basic government, housing and increases in net monthly pay had the greatest impact on ~~-~~the respondents' utility ~~associated with~~ of taking up a particular job over the other. ~~(Mangham and Hanson,2008).~~ Largarde and Blauuw (2009) opined jobs located in rural areas had a negative impact on respondents' choice, with Kolstad (2010) suggesting that, to ensure an efficient matching of individuals and sectors, it may be worthy to have two sectors by allowing employers in these sectors to use different payment mechanisms designed to attract and support worthy performance from different types of workers. Retention of individuals could be improved by designing quite different job packages to

appeal different tastes with salary remaining an important factor in making jobs attractive (Doiron et al., 2011).

Demography Cohort and Job Preference

Gender is important when making career choices ~~(refer to Figure 2)~~ because gender role socialization leads males and females to evaluate job attributes differently (Barbulescu and Bidwell, 2012). Behaviour is acquired from the environment through a process of observational learning, mediating processes between stimuli and response (Bandura, 1977). Because of this, female children grow-up learning family values and so consequently, seek jobs with low workload to secure family time (Kretchmar, 2009). The importance of job preferences for women generally depends on their birth generation (Gallie *et al.,* 2012). Conversely, male children mature in the belief that they are the family financier and therefore, may engage in extra work hours to seek a higher salary to maintain the home. According to Gallie *et al.,* 2012, women born in earlier decades primarily believed to be, and were seen as, homemakers. Chusmir and Parker (1991) supported this claim by stating that females are more inclined towards work that provides a flexible working schedule, less demanding job and family friendly policy that allows them to fulfil dual roles as employees and homemakers. Of course, these are broad statements and in contemporary times (particularly in the West), the roles and values of both men and women are more equal whilst in developing countries, attitudes will continue to change in future generations.

<Insert Figure 2 about here>

THEORETICAL FOUNDATION

Various theories and methodologies underpin this study and in particular, the random utility theory is particularly important.

Random Utility Theory

Random utility theory underpins a DCE which assumes that individuals maximize utility (Vooren *et al.,* 2019); where utilities of an individual can be summarized by two components viz.: systematic; and random. The systematic component is made up of attributes that impact an individual's choice whereas random components consists of all unidentified factors that influence the choice (Louviere *et al.,* 2010). It is assumed that, the random utility of alternative i, Ui, for an individual in random utility models take the form:

$$U_{ij} = V_{ij} + E_{ij} \qquad \qquad \text{(\textbf{Equation 1})}.$$

Uij is the utility of alternative j for consumer i, where Vij is the deterministic component and Eij is the random component or error term. Raghavarao *et al.* (2011) stated that the random utility (U) assumes that on a given choice set, individuals choose the alternative they deemed to have the greatest utility on that occasion; thus, alternative i is preferred to alternative j if, and only if, utility (Ui > Uj). Since the researcher cannot observe an individual's true utility function, a probabilistic utility function is used in the estimation (*ibid*) viz: assume an individual choosing between two alternatives, i and j, then the probability that alternative i is chosen is given by:

$$P_i = \text{Prob}\ (U_i > U_j) = \text{Prob}\ (V_i + E_i > V_j + E_j) = \text{Prob}\ (V_i - V_j > E_j - E_i) \qquad \textbf{(Equation 2)}.$$

A product's attractiveness can be related to its attributes and so the factors that influence preference must be identified and included prior to data collection and modelling (Louviere, 1998). These attributes can be derived from focus groups that are tailored to a particular project, literature sources, prior experience with the same or similar products or services, and/or from a combination of different approaches. Therefore, preference data can be analysed using methods that are compatible with random utility theory (Clark *et. al,* 2014). Thus, attributes that are used for each job description should be the main factors influencing respondents' job preference (Mangham and Hanson 2008).

Approach to Preference Measurement
The outcome of an individual's preference can be assessed using either the revealed preference theory or the stated preference approach. Understanding the impact on how the characteristics of alternatives affect preferences for goods or services is important in scientific fields where predicting human choice is of interest (Raghavarao *et al.,* 2011).

Revealed Preference
Revealed preference deals with the inferences that are made from the observation of an individual's actual market behaviour. Under the revealed preference, it is assumed that the individual's preferred alternatives (from different feasible sets) are being recorded by an observer (Nishimura *et al.,* 2016) and that there should be a market demand curve for the goods in question for which the preference is being made (Kjaer, 2005). Revealed preference studies seek to make sense from the observed individual's behaviour. For instance, if an individual prefers job A over job B it is assumed that the individual's preferences are stable over the observed time period, i.e. the individual will not reverse their relative preferences regarding career A and B (Raghavarao *et al.,* 2011).

Stated Preference
The stated preference addresses most limitations of the revealed preference. In stated preference, the observations of real market behaviour of individuals are not employed but rather individuals are invited to compare hypothetical scenarios (Kjaer, 2005). Raghavarao *et al.* (2011) stated that, uncertain and ambiguous indications are eliminated so that all respondents have the same information and no more.

Stated Preference versus Revealed Preference
Table 1 represents a side-by-side comparison of revealed and stated preference; where the weakness of one is complemented by the other.

<Insert Table 1 about here>

Although the revealed preference theory can be adopted for this study, it is generally limited to helping researchers understand preferences hence, justification for using the stated preference approach (Nyarko *et al., 2015*)

Discrete Choice Experiment (DCE)
The basic concern of economics is to better understand human preference behaviour (McFadden, 1974). DCE is a methodology used to elicit preferences from respondents who are presented with

a hypothetical scenario with not more than five attributes (each with their respective levels (cf. York, 2016)) and it is used in studies where revealed preference data is difficult to obtain or is absent (Mangham *et al., 2009*). To apply DCE, individuals are asked to state their preference using hypothetical scenarios (*ibid*). The word 'discrete' is indicative of a choice that is individually distinct and that it is only possible to choose one alternative from two or more alternatives. This method provides policy makers with quantitative measures of the relative significance of career attributes that impact the decision of respondents (World Health Organisation *et al.,* 2012). Figure 3 2 illustrates the process by which the DCE is set up and implemented.

<center><Insert Figure 3 2 about here></center>

METHODOLOGICAL SETTINGRESEARCH METHODOLOGY

The research adopts empirical 'quantitative methods' in the collection and analysis of data under the epistemological lens of a positivist research paradigm set within a cases study strategy (cf. Ryan and Julia, 2007; Edwards et al., 2019; Edwards *et al.,* 2020). A deterministic analysis is then adopted using conditional logit regression for the prediction of outcomes involving job choice preference within an overarching deductive approach – where theories previously eluded upon within the literature are robustly tested (Bhattacherjee, 2012). To assist with the analysis and interpretation of data, the STATA statistical software was utilised. Data was collected using a Google forms' self-administered closed ended questionnaire (Owusu-Manu et al., 2020). This data collection instrument was first developed and piloted using: i) secondary data sourced from literature to determine the attributes and their respective levels for the development of job profiles to be used; and ii) a focus group consisting of fifteen postgraduate students who confirmed that the questionnaire was user-friendly and appropriate for the research setting. For the main survey, a cross sectional research design was employed where data was collected from respondents using the closed ended questionnaire. Bhattacherjee (*ibid*) states that the palpable benefits of the cross-sectional research design include its: strong external validity hence, data collected can be generalized to the population of the respondents; ability to capture and control a large number of variables; and capability to study a problem from different angles thus, ensuring that data is rigorously interrogated.

Population and Sampling Strategy

Because of time and resource constraints, a study of the entire population of Kwame Nkrumah University of Science and Technology-Institute of Distance Learning (KNUST-IDL) postgraduate student community would be difficult. Consequently, each programme offered by the institution was considered as a stratum and respondents were selected from each strata using a stratified random sampling. In conducting a DCE, Ryan *et al.,* (2008) suggest that using a sample size < 30 will not yield a precise result. Orme (2010) proposed a formula which should be used a rule of thumb in determining the minimum sample size for a DCE, namely:

$$n \geq 500c/ta \qquad \textbf{(Equation 3)}$$

'n' is the minimum sample size or the number of respondents, 't' is the number of tasks (in this research, there are 28 tasks per respondents), 'a' is the number of alternative per task (there are two alternative per task) and 'c' is the largest number of levels for any one attribute (the salary

attribute had the largest attribute of 4). Using the formula above, our sample size should not be $\leq$ 36 respondents. For this study, a sample of 150 respondents was used and each respondent were presented with a 28 choice set, each with two alternatives.

Designing of the Discrete Choice Experiment (DCE)
The DCE sought to elicit respondents' preferences using choice sets which consist of attribute and attribute levels derived from the focus group and secondary data. Respondents were asked to choose between pairs of hypothetical job profiles. The characteristics of each job profile were the main factors that were considered to be the most influencing and affecting their career preference (Adamowicz and Louviere, 1998). Five attributes were determined to be the most important attributes that had an influence upon respondents in their selection of a job, namely: net salary; location of work; workload; supportive management; and challenging job (see Table 2).

<center><Insert Table 2 about here></center>

In generating the job profiles, a two-level full factorial design for the four factors (location, workload, supportive management and challenge) and a 4-level full factorial design for one factor of net salary (which is expressed mathematically as $2^4\ 4^1$) will generate 64 runs of job profiles and a total of 2,016 choice sets. However, a full factorial design is cost intensive and tedious for respondents to consider all possible choice sets (Kuhfeld, 2010). Hence, the application of a fractional factorial design which was orthogonal and balanced to reduce the number of job profiles was adopted. A design is: i) balanced when each level occurs equally often within each factor; and ii) orthogonal when every pair of levels occurs equally often across all pairs of factors (Kuhfeld, 2010). In a DCE, each row from the designs forms an alternative, while a combination of alternatives forms a choice set. Using the orthogonal design feature in SPSS, the 64 runs of job profiles were reduced to 8 (refer to Table 3) with a total number of 28 choice sets.

<center><Insert Table 3 about here></center>

The DCE Questionnaire
The research's primary quantitative data used to assess respondents' preferences were collected using the various choice sets generated after a brief introductions to the various choice sets. As suggested by Kjaer (2005), it is useful to provide an example choice set in the questionnaire introduction so as to better explain the technique to the respondents before implementing the actual choice task. To elicit respondents' preferences, they were asked to make their choice for a hypothetical job. Prior to the questionnaire's administration, a pretest was undertaken to determine the degree of complexity of the experiment and also to assess data reliability and validity. For this research, validity is the ability of the DCE questionnaire to measure what it is designed to measure (the preference of respondents). To measure the research's internal or theoretical validity, respondents' choice behaviour were analysed to determine if, for example, preference of Job 1 over Job 2 and Job 2 over Job 3 must yield a preference of Job 1 over Job 3. 82% of the respondents showed evidence of transitivity in their choice behaviour during questionnaire analysis. Results from DCE were considered to be internally valid when respondents' choices conform to the rational choice theory - as defined by the axiom of transitivity and stability (Rakotonarivo, 2016). To test data reliability, the consistency of 28

choice sets with five attributes were analysed by observing the number of identical choices made within the different time intervals. To decrease the probability of carry – over effects, a significant time interval was used between test and retest. In evaluating the reliability using the test-retest method, the same instrument or questionnaires were used on the same sample at different time intervals (Liebe *et. al,* 2012). The analyses of parameters in the two models (conditional logit model) then commenced at the test and retest stage to determine if there was a significance difference between the parameters. In the test – retest stage, 83% of respondents were in agreement given a reliability coefficient of 76%; such a coefficient value (based on kappa statistics coefficient between 61% to 80%) showed substantial reliability of the survey instrument.

Data Collection
Data from respondents were collected using a combination of self-administered close-ended questionnaires and a computer-based data collection method. During the self-administered or face-to-face technique, the enumerator explained any difficulties encountered in the questionnaire completion. In the computer-based data collection method, email addresses of respondents were used to deliver the questionnaires for eliciting respondents' preferences. Data collected was then entered and organized into a spread sheet and later imported into STATA for further analysis using the conditional logit function estimate to determine the probability of choosing a job profile (Job A) when the alternative (Job B) is held constant.

The Model
Responses observed were used as the dependent variable while those attributes that were varied in the survey were considered as independent variables. Thus, if a job in a particular choice set is selected, it can be said that the probability or utility in preferring a job over its alternative in the choice set is greater. The model adopted for this study is based on the random utility theory which is given mathematically as Prob $(Y=1|X)$ = Prob $(U_{jobA} > U_{jobB})$ with the assumption that the utility associated with every job depends on the attribute and attribute level. The linear and additive model used for this experiment is:

$$P[Y=1|X]=\beta_0+\beta_1 S_1+\beta_2 S_2+\beta_3 S_3+\beta_4 S_4+\beta_5 Lo_d+\beta_6 Lo_c+\beta_7 Wk_{et}+\beta_8 Wk_{nt}+\beta_9 S_{un}+\beta_{10} S_{su}+\beta_{11} C_y+\beta_{12} C_n+\varepsilon$$

(Equation 4)

Where: Y= dependent variable (choice) which is 1 when Job A is taken and 0 otherwise; β_i = coefficient or constant for the alternatives (where $I = 1,2,3,4….12$); S_1 = net monthly salary of GHC 2,500.00; S_2 = net monthly salary of GHC 2,800.00; S_3 = net monthly salary of GHC 3,100.00; S_4 = net monthly salary of GHC 3,400.00; Lo_d = job located in district town; Lo_c = job located in city; Wk_{et} = work an extra hour; Wk_{nt} = works no extra hour; S_{un} = unsupportive management; S_{su} = supportive management; C_y = very challenging; C_n = not challenging; and ε = error term.

DISCUSSION OF RESULTS
A total number of 128 respondents from a sample frame of 150 completed the questionnaire representing a 85.33% response rate. These respondents consisted of 69 males and 59 females

thus, representing 54% and 46% of the total sample size respectively. This sample also broadly concurs with information from the Ghana living standards survey (2015) which suggests that the proportion of males who studied higher education qualifications was higher than females. Table 4 shows descriptive statistics of participating respondents.

<Insert Table 4 about here>

Regards employment, 112 respondents were employed while 16 respondents were unemployed and this represented 87.5% and 12.5% of the total sample size respectively. The percentage of unemployed individuals used for the research was higher than the unemployment rate (11.90%) recorded in 2015 and lower than the all-time high 12.90% recorded in 2005 (*ibid*). Out of the 112 respondents' students who were employed, 71.9% occupied non-managerial positions while 28.1% occupied various managerial positions.

Modelling the Job Preference
In modelling the respondents' job preference, the impact or utility (increasing or decreasing) of the various attributes and their respective levels (refer back to Table 2) were analysed. The attribute salary was considered as a continuous variable while other non-monetary variables were coded as dummy variables. Prior to the analysis the respondents' preference model, tests for multicollinearity within attributes and their respective levels was conducted. In a DCE, the effect of these highly collinear variables or attributes obscures the identification of predictor variables that have an effect on the preferences of individuals (World Health Organisation *et al.,* 2012). Consequently, the following variables were excluded from the analysis due to the existence of multicollinearity: salary of GHC 2,500.00; job located in district; works an extra hour; no challenge; and unsupportive management.

To assess and model the preference of respondents, conditional logit was adopted which is appropriate for estimating choice behaviour models). Conditional logit is well suited for choice experiments where the characteristics that make up an alternative are of interest to the researcher rather than the characteristics of the respondent making the choice (cf. Hoffman and Duncan, 1988). For this research, the preference of a job alternative in each choice set is defined by its attribute and their respective levels. Table 5 presents estimates used in modelling respondents' job preference. The preference of a job alternative considered as the outcome variable was dependent on the following independent variables: salary (GHC 2,800.00, GHC 3,100.00, and GHC 3,400.00); no extra hours; job located in the city; supportive management; and a very challenging job.

<Insert Table 5 about here>

The analysis results show that the model as a whole was significant with a *p* value of 0.000. This implies that at least one of the regression coefficients (Beta) is not equal to zero – therefore, the model fits significantly better than a model with no independent variables. The analysis also reveals that all the coefficients for the attributes were significant at the 95% confidence level except for 'workload of no extra hours' which was not significant.

A positive sign of the beta coefficient implies an increase in utility of preferring a job alternative over another, while a negative coefficient means a decrease in preference utility. Thus, a positive sign signifies respondents' interest in one attribute over the alternative, while a negative sign denotes otherwise (Lyu, 2018). From Table 5, the following attributes: supportive management; job in city; salary in the range (GHS 2,800 to GHS 3,400); and very challenging job had a positive impact on respondents' preference for a job relative to their alternative - thereby increasing their utility to take the job. Hence, job located in the city relative to one located in a district town increased the utility of respondents' accepting the job by 0.324042. This was not surprising considering the high perception of opportunities available to individuals living in a city vis-à-vis district town. To increase job preference located in a district town, Kolstad (2010) suggested that there should be a room for increase in salary or allowance given to individuals who are posted in these areas. Again, results from the model shows that the utility of respondents increased from 0.524 to 1.282 with an increasing salary level (GHS 2,800.00 to GHS 3,400). For example, an increase of GHS 1 in the respondents' salary (GHS 3,400) will increase their utility by 1.282 times the resulting increase. Hence, increased salary should have a positive impact on the retention of postgraduate students of KNUST-IDL.

Regards the attribute 'challenge', the respondents' preferences were positively affected by very challenging jobs and the utility of postgraduate students increased by 0.4926365 relative to a job that is not challenging. Perhaps a mental challenge is one reason why students study on a post graduate award in the first instance - future work is required to explain this observed phenomena. Curiously, 'workload of no extra hours' decreased the utility of respondents' job preference and as such, had a negative impact upon their job preference. This result agreed with Demel *et al.,* 2019 who found that a flexible job schedule had a negative impact on the preferences of postgraduate students. The authors (*ibid*) opined that there are expectation for graduates to work long hours in their new jobs hence, the negative impact.

Though there are some limitations that are unavoidable in conducting a DCE (such as respondents not taking the research seriously when completing their responses), it was evident that the experiment was able to simulate a real world situation. By applying the DCE, attributes that had a significant and positive impact upon the career choice preference of respondents were consistent with theory (for example increase in salary having an effect on increasing utility) and previous literature (cf. Doiron *et al.,* 2011; Mangham, 2007).

INVESTIGATING GENDER DIFFERENCES IN THE PREFERENCE OF A JOB
Table 6 presents parameter estimate outputs for male and female postgraduate students. The estimates were used to assess the relative impact of each attribute and attribute level on their job preference.

Insert Table 6 <about here>

The model produced for male respondents fits significantly better than a model with no predictors. With the exception of no extra hours which had an insignificant effect upon the choice preference of a job, all estimates of the coefficient had a positive impact upon the respondents' choice thereby increasing their utility of choosing a job over an alternate one. The key attributes of supportive management, job located in the city, a challenging job and salary

increased the utility of the male respondents' preferences of a career or a job. For instance the uptake for a job located in the city, and with a salary of GHC 3,400.00, increased the utility of male respondents by 0.2770092 and 1.293559 respectively - relative to a job located in a district town with a net monthly salary of GHC 2,500.00. Again jobs that are very challenging also had a positive impact on the male respondents' preference thereby increasing their probability uptake by 0.5142833 - compared to a job which was not challenging. Consequently, the model for male respondents revealed that the coefficients signs of attributes were the same as the main model indicating similar impact (with varying utility) on job preference.

~~Table 7 below presents the parameter estimates for female respondents.~~From table 6 above, ~~T~~the model for female respondents was also significant at the 95% confidence level. Again with the exception of 'job with no extra hours' which was not significant, all other attribute levels were considered significant and thus, had a positive impact on female respondents' job preference. It was expected that 'job with no extra hours' might have had a positive impact on female respondents preference due to their predilection towards securing a flexible working schedule (cf. Chusmir and Parker 1991). However, this was not apparent as seen from the coefficient (β_4 = -0.2043216) which showed a decreasing utility relative to working an extra hour. This negative impact on female respondents' preference might be attributed to respondents not considering this attribute level (no extra hours) during the trade-off between options available.

<center>~~<Insert Table 7 about here>~~</center>

How supportive the management of a job is, relative to an unsupportive management, increased the utility associated with a female's career choice by 0.4856573. The model for female respondents as a whole was significant at 95% confidence and hence, there were no significant difference in the model for male and female postgraduate students. Though the attribute levels had the same impact (same coefficient sign) on the job preference for both male and female respondents, from the two models it was evident that male and female utility for job vary with regards to the various job attributes. For instance, the utility of female respondents preferring a job in the city increased by 0.3939604 while male respondents increased by 0.2770092.

With regards to the theory of gender role socialisation, Barbelscu and Bidwell (2012) in assessing why men and women choose different jobs concluded that male and female students rated the value of money in relation to a job differently. Specifically, the authors (*ibid*) stated that female students were less likely to value money in their choice of a job when compared to male students. This assertion made concurs with the findings presented in Tables 5 and 6 where the utility for a job with salary GHC 3,400.00 increased by 1.264 for female respondents while that of male respondents increased by 1.294.

Ranking of Attributes Based on their Impact on Respondents Preferences.
The impact of attributes and their respective levels used for the study were analysed and ranked to determine their relative importance in respondents' job preference. According to Mangham and Hanson (2008), this order is achieved by calculating the ratio of the coefficient of a non-monetary attribute to that of a net monthly salary (for example GHC 2,800.00). A rank of 1 indicates the attribute which had the most impact on postgraduates' job preference while 8 indicates the least impact. The results are shown in Table ~~8~~7.

<Insert Table ~~8~~ 7 about here>

Results from Table ~~8~~7 reveal that the salary of GHC 3,400.00 had the highest impact (ranked 1) on the job preference of post graduate distance learning students. This result concurs with the research of Mangham and Hanson (2008) where the highest monthly pay had the most significant impact on the respondents' choice of job. Aside salary being a motivating factor in job preference, there are other non-monetary attributes which must be considered during the retention and recruitment process of postgraduate students. Among these attributes was a job with supportive management which was seen to have a positive impact on the preference of a job and hence, ranked higher than a salary of GHS 2,800.00. However, since workload was not considered as significant by respondents' job preference, it would be prudent for policy makers not to assign more resources to this attribute.

Theoretical and Managerial Implications

Studies on discrete choice experiments have been extensively employed in developed countries with few studies applying this approach in developing countries – primarily, due to the cost involved at the data collection stage and also a lack of experience with this survey method (Nguyen *et al.*, 2015). Hence, this study is the amongst the first to employ the use of a DCE and electronic self-administered closed ended questionnaires to elicit job preferences from post graduate students in the developing country of Ghana. This novel approach secured a high response level from participants. The knowledge contribution also proved that jobs with no extra hours of workload were not considered to be significant for both male and female post graduate students - this claim challenges the assertion made by Chusmir and Parker (1991) that flexible working hours had a significant effect on female job preference. This finding will require additional future research to further elucidate upon the reasons for this apparent anomaly. It was also evident that a postgraduate student's job preference was greatly influenced by how challenging the job is relative to a non-challenging job. This phenomenon may be attributed to postgraduate students' desire to further the boundaries of knowledge to secure a better position or rapid promotion by generating innovative ideas and the application of new knowledge acquired from their various programmes.

~~Contributions to knowledge~~

However, further research is again required to further examine and expand upon this initial finding.

CONCLUSIONS AND RECOMMENDATIONS

The DCE adopted for this study helped to construct a wider range of hypothetical job alternatives than would otherwise be possible and revealed post graduate employment preferences. The attributes that had the greatest impact upon career choice preferences of the postgraduate students of KNUST-IDL in order of importance were: salary of GHC 3,400.00, salary of GHC 3,100.00; supportive management; salary of GHC 2,800.00; very challenging job; job located in the city; and no extra working hours. The inclusion of salary was in line with prior expectation and economic theory which suggests that the higher the salary, the higher the utility associated with it. Hence, it was found in the study that an increase in salary (from GHC 2,800.00 to GHC 3,400.00) increased the utility of postgraduate students. Aside salary, which had the greatest impact on career choice, supportive management also played an important role in the

postgraduate students' job preferences. The high preference for supportive management was in line with the findings of Doiron *et al.* (2011).

Three primary recommendations stem from this research for policy makers, employers and recruitment organisations. First, salary is an important factor that should not be overlooked during employment of postgraduate students. Hence, postgraduate students who are posted to district towns (which had negative impact upon the job preference) should be compensated with high salaries as suggested by Largarde and Blauuw (2009). Second, policies which promote supportive management at workplaces should be implemented in order to increase the retention rate of postgraduate students. Consequently, job attributes that make a position attractive to postgraduate students should be tailor made to their needs and preferences. Third, policy makers should adopt quantitative methodologies (vis-à-vis subjective judgement) for eliciting preferences of their employees. This will help in determining robust and appropriate policy options that impact upon job turnover and retention.

An issue for further study is the need to expand the scope of work undertaken to include postgraduate students from different generational cohorts and other institutions within Ghana as well as other similar developing nations. Such a study will seek to further elucidate upon students employment preferences within prescriptive guidance for employers and policy makers as a practical and impactful product of this work.

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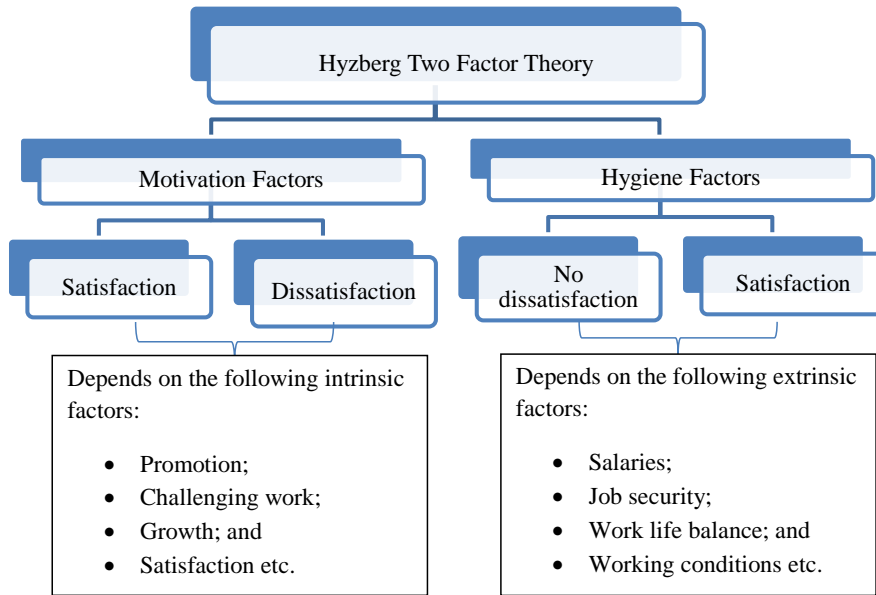
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Figure 1 - Factors affecting employee retention and turnover using the Hyzberg Model.

	Hyzberg Two Factor Theory	
Motivation Factors		Hygiene Factors
Satisfaction / Dissatisfaction		No dissatisfaction / Satisfaction

Depends on the following intrinsic factors:

- Promotion;
- Challenging work;
- Growth; and
- Satisfaction etc.

Depends on the following extrinsic factors:

- Salaries;
- Job security;
- Work life balance; and
- Working conditions etc.

Figure 2 Framework designed using Kretchnar (2009) research on gender socialization

Table 1 – Revealed and stated preferences

	Revealed preference	**Stated preference**	**References**
Approach	The preferences of individuals are determined by studying their real market behaviour.	Individuals are asked to state their preference using a hypothetical situations or scenarios.	Nyarko *et. al.,* 2015; Kjaer, 2005.
Alternatives	Actual alternatives responses to non-existing alternatives are not Observable.	Preferences of new alternatives can be elicited from generated alternatives.	Morikwa, 1994.
Attributes	May include highly correlated attributes.	High correlation eliminated by an experimental design.	Morikwa, 1994.
Choice Set	Not generally specific in some cases.	Pre-specified or pre-defined	Morikwa, 1994.
Number of Response	Obtaining multiple responses is difficult.	The use of repetitive questioning is easily implemented	Morikwa, 1994.
Disadvantage	Study is limited without prior supply of information that had already been experienced.	In some circumstances, respondent's choice may not represent actual behaviour in real world situation.	Nyarko *et. al.,* 2015; Kjaer, 2005.
Advantages	Due to the observation of real market behaviour, studies of this nature have increasing external validity.	Provides preferences and information that are otherwise impossible to reveal when actual choice behaviour is restricted in some way.	Kjaer, 2005.
	Low-cost evaluation	Ensures sufficient variation in data	

Sources: Morikawa, 1994; Kjaer 2005; Nyarko *et. al.,* 2015.

Figure 3 2 - Framework for setting up a DCE

	Define the Problem

Select the Target Group for the experiment

Use Focus group ↔ Selection of Attributes and levels for the Experiment ↔ Use secondary data

Create hypothetical job profiles using the selected attributes and levels ← Selection of an experimental design.

Create choice set from the job profiles

Choice sets used as questionnaire for the experiment. → Data collection → Data Analysis

Sources:Ryan et. Al,2001; Mangham, 2007;Lagarde and Blauuw,2011;

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Table 2 – Attributes, description and levels

Attributes	Description	Levels
Net salary.	The net monthly salary.	• GHC 3,400.00 per month. • GHC 3,100.00 per month. • GHC 2,800.00 per month. • GHC 2,500.00 per month.
Location.	Location of the job.	• City. • District town.
Workload.	Number of hours required to complete a daily task after work closes.	• Works no extra hours to complete task each day. • Works an extra hour or more to complete task each day.
Supportive management.	Support given to the employees by the management.	• Unsupportive. Management and staff. • Supportive management and staff.
Challenging.	Job involves challenging task.	• Not challenging. • Very challenging.

Table 3 – Eight runs of job profile

Job Id	Salary	Location	Support	Challenge	Workload
1.	2,500.00	District town.	Unsupportive management.	Not challenging.	No extra hours.
2.	2,500.00	City.	Supportive management.	Very challenging.	Works more than an extra hour each day.
3.	3,400.00	City.	Supportive management.	Not challenging.	No extra hours.
4.	3,100.00	District town.	Supportive management.	Very challenging.	No extra hours.
5.	2,800.00	District town.	Supportive management.	Not challenging.	Works more than an extra hour each day.
6.	2,800.00	City.	Unsupportive management.	Very challenging.	No extra hours.
7.	3,400.00	District town.	Unsupportive management.	Very challenging.	Works more than an extra hour each day.
8.	3,100.00	City.	Unsupportive management.	Not challenging.	Works more than an extra hour each day.

Table 4 : Age and respondent Statistics

Age Group (Years)	Male	Percent	Female	Percent	Total	Percent
24 - 29	38	30%	36	28%	74	58%
30 - 37	26	20%	20	16%	46	36%
38 - 45	2	2%	2	2%	4	3%
45+	3	2%	1	1%	4	3%
Total	**69**	**54%**	**59**	**46%**	**128**	**100%**

Table 5 - Empirical model based on respondents' preference (main model)

ATTRIBUTES	BETA	COEFFIECIENTS	STANDARD ERROR	Z	P>|Z|
Salary (Relative to GHC 2,500)					
GHC 2,800.00	β_1	0.5249754	0.1430648	3.67	0.000
GHC 3,100.00	β_2	1.16334	0.1570055	7.41	0.000
GHC 3,400.00	β_3	1.282259	0.1373139	9.34	0.000
No extra hours(Relative to extra working hours)	β_4	-0.1033793	0.0821754	-1.26	0.208
City (Relative to district town)	β_5	0.3240423	0.0703908	4.60	0.000
Supportive Management (relative to non-Support)	β_6	0.6928615	0.0898809	7.71	0.000
Very challenging (Relative to no Challenge)	β_7	0.4926365	0.0745649	6.61	0.000
CONSTANT	B_0	0.1802536	0.1012723	1.78	0.075

NB: Number of respondents = 128; and prob > chi square = 0.0000

Table 6 - Parameter estimates of male and female respondents.

	Attributes	Betas	Coefficients	Standard Error	Z	P>|Z|
Male Respondents						
	Salary (Relative to GHC 2,500)					
	GHC 2,800.00	β_1	0.4468581	0.1878952	2.38	0.017
	GHC 3,100.00	β_2	1.127863	0.2076921	5.43	0.000
	GHC 3,400.00	β_3	1.293559	0.180143	7.18	0.000
	No extra hours(Relative to extra working hours)	β_4	-0.0291378	0.1082699	-0.27	0.788
	City (Relative to district town)	β_5	0.2770092	0.0921165	3.01	0.003
	Supportive Management (relative to non-Support)	β_6	0.8461281	0.1199821	7.05	0.000
	Very challenging (Relative to no Challenge)	β_7	0.5142833	0.0978014	5.26	0.000
	CONSTANT	B_0	0.0538476	0.1343182	0.40	0.688
Female Respondents						
	Salary (Relative to GHC 2,500.00)					
	GHC 2,800.00	β_1	0.6292762	0.2217101	2.84	0.005
	GHC 3,100.00	β_2	1.204843	0.2405376	5.01	0.000
	GHC 3,400.00	β_3	1.264987	0.2128265	5.94	0.000
	No extra hours(Relative to extra working hours)	β_4	-0.2043216	0.126972	-1.61	0.108
	City (Relative to district town)	β_5	0.3939604	0.1097845	3.59	0.000
	Supportive Management (relative to non-Support)	β_6	0.4856573	0.136635	3.55	0.000
	Very challenging (Relative to no Challenge)	β_7	0.4628911	0.1157794	4.00	0.000
	CONSTANT	B_0	0.3502879	0.1552331	2.26	0.024

Table 7 Parameter Estimates of Female Respondents.

Table 78 - Relative importance of career attributes on respondents' preferences

Predictor Variables	Magnitude of Coefficient (Beta)	Ratio relative to Net Monthly salary GHC 2,800	Rank
Net salary GHC 3,400.00	1.2822590	2.44251254	1
Net salary GHC 3,100.00	1.1633400	2.21598955	2
Supportive Management	0.6928615	1.31979803	3
Net salary GHC 2,800.00	0.5249754	1	4
Challenge (Very)	0.4926365	0.93839921	5
Location (City)	0.3240423	0.61725235	6
No extra hours to work	0.1033793	0.19692218	7