Student Motivation and the ‘Feel Good’ Factor: An Empirical Investigation of Distinct Motivational Types as Predictors of University Service Quality Evaluation and the Moderating Role of Outcome Valence

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ABSTRACT

With the globalisation of the higher education industry, service quality in the higher education services is seen as a vital factor in determining a university’s competitive advantage. The purpose of this study is to extend current conceptualisation of service quality research by investigating the influence of self-determination and outcome valence in the form of student’s feelings towards their academic result, upon university service quality (USQ). On the basis of the research findings, this study suggests that the effect of motivational differences and academic outcome valence upon USQ evaluation should be taken into account when considering how students’ USQ perception is formed. These pertinent issues deserve considerable attention as they have a bearing upon important outcomes such as student satisfaction and staff performance appraisal.

Keywords: service quality, perception, motivation, emotions

Since the mid-twentieth century, the pursuit of ‘quality’ has emerged as a dominant theme in managerial concerns, with initial ideas developed from the manufacturing sector (Beckford 2010) and in the 1980s, the academic inquiry into the notion of ‘service quality’ took place in an accelerated fashion with hallmark contributions from pioneering researchers such as Grönroos (1984), Lehtinen and Lehtinen (1982), Cadotte, Woodruff and Jenkins (1987), and Parasuraman, Berry and Zeithaml (1985, 1988). In the higher education domain, service quality has gained considerable attention due to its potential impact upon improved student satisfaction which leads to increased loyalty (Hennig-Thurau, Langer & Hansen 2001; Smith, Smith & Clarke 2007; Voss, Gruber & Szmigin 2007). As the role of higher education has been extended to include its commercial impact upon the national economy, service quality is seen as a critical factor towards an institution’s sustainability and a source of competitive advantage.

Majority of research efforts in the higher education service literature assess students’ perception towards a particular university service offering (e.g. Jusoh et al. 2004; Barnes 2007; Carter 2009; Kwek, Lau & Tan 2010) based on a set of proposed dimensions. Although the understanding of service quality dimensions and students’ perception is important, it is also essential to examine potential antecedent conditions which may influence an individual’s University Service Quality (USQ) perception. As expressed by Steinwachs and Hughes (2008), one of the challenges in understanding quality is the influence of antecedent conditions such as personal factors. An interesting concern has also been raised by Brady et al. (2006) which highlight the effect of outcome valence in certain industries such as higher education, legal firms or sports centres, where the service outcome is difficult
to control (e.g. for a student to obtain excellent grades, a client to win a case or a favourite team to win the game). Specifically in the higher education service industry, many students tend to assess their education more by grades received rather than knowledge disseminated. This area deserves attention because a negative valence is a possible outcome of a well-delivered service experience and may have a bearing upon the overall service evaluation.

Anchoring upon these recent developments in the literature, this study examines the impact of an individual’s motivation in higher education pursuit towards perceived service quality in higher education and the moderating effect of outcome valence. Based on the self-determination theory, this paper extends Chong and Ahmed (2012)’s study by examining the impact of different types of motivation in higher education participation upon service quality perception and investigates the moderating effect of academic outcome valence, which is in the form of student’s feelings towards their academic results.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The Source of Expectations in University Service Quality Evaluation

An important factor acknowledged as a significant predictor of student satisfaction, retention or attrition is the attitudes formed before enrolment (DeShields, Kara & Kaynak 2007; Hill 1995). This view is noteworthy in the consideration of antecedents for educational service quality because attitudes formed before enrolment tends to influence students’ expectations on their USQ experience. These expectations are instrumental in determining service quality perception since quality is essentially a result of comparison between expectation and perceived service received (Bolton & Drew 1991; Cronin & Taylor 1992; Parasuraman, Zeithaml & Berry 1988; Shank, Walker & Hayes 1995). This is in line with Athiyaman’s (1997) assertion that students’ perception of service quality is a variance between pre-enrolment service expectations and the perceived service performance received during the course of study. Zeithaml, Parasuraman and Berry (1990) also propose that personal needs of the customers tend to shape their expectations. This observation is also in line with psychological studies which emphasise that the recognition of individual’s needs is seen to be an important step
towards understanding how contextual factors impact upon outcomes such as motivation, behaviour, affect and well-being (Deci & Ryan 2008).

**Self-Determination Theory in Understanding Academic Motivation**

One of the leading human motivation theories in the psychology literature is self-determination theory (SDT) which is widely tested and applied in various fields such as education, sports, parenting, health and well-being (Deci & Ryan 2008). This theory asserts that to understand why people participate in certain activities or behave in certain ways, the different types of motivation need to be distinguished as they would lead to varied outcomes (Ballmann & Mueller 2008). The most central distinction in SDT is between autonomous motivation and controlled motivation. Autonomous motivation is based on self-regulated orientation which comprises of intrinsic motivation and the type of extrinsic motivation in which people have identified with an activity’s value and integrated into the sense of self (i.e. identified regulation). Controlled motivation consists of extrinsic motivation in the forms of external regulation where one’s behaviour is determined by external contingencies of reward and punishment and introjected regulation which action is based on approval motive, avoidance of shame or contingent self-esteem (Deci & Ryan 2008).

Both autonomous motivation and controlled motivation energise and direct behaviour and they are different from the state of amotivation which refers to a lack of intention and motivation. Relative to controlled motivation and amotivation, autonomous motivation tends to yield greater psychological health, persistence, enjoyment, satisfaction and overall well-being (Lin, Tsai & Chiu 2009; Ntoumanis 2005). The application of SDT in the context of student motivation for higher education participation potentially provides insights into the different types of motivation which may predispose students to varied outcomes especially in terms of overall study experience which may have bearing on service quality perception. Therefore, this study postulates that students who are autonomously motivated (i.e. possess a greater degree of self-determination) tend to report a more favourable learning experience while those who are driven by controlled motivation and amotivation tend to have a less favourable university service experience. To examine the effects of distinct motivational orientations as the antecedent of USQ evaluation, the following hypotheses are developed:
H1: The Autonomous Motivation of a student’s higher education participation will have a positive influence upon University Service Quality evaluation.

H2: The Controlled Motivation will have a negative influence upon University Service Quality evaluation.

H3: The Amotivation state of a student’s higher education participation will have a negative influence upon University Service Quality evaluation.

Service Quality: Theoretical Background

The conceptualisation and measurement of service quality perceptions is considered as one of the most debated and controversial topics in the service marketing literature to date (Brady & Cronin 2001). Evaluation of service quality is difficult due to characteristics that are inherent in services – intangibility, heterogeneity, perishability and inseparability (Parasuraman, Zeithaml & Berry 1988). The majority of research efforts are anchored in the perspectives derived from Grönroos (1984) and Parasuraman, Zeithaml & Berry (1988). Grönroos’ Nordic perspective adopts a categorical approach to conceptualise service quality in global terms of functional and technical quality. In contrast the American perspective of Parasuraman, Zeithaml & Berry (1988) made notable progress with the introduction of the SERVQUAL instrument which used descriptive terms, namely reliability, responsiveness, empathy, assurances and tangibles to form the construct of the service delivery process. Both perspectives highlight important aspects of service quality, but neither fully captures the construct (Liu 2005). An alternative model was introduced by Rust and Oliver (1994) who categorised service quality into three components, i.e. service product, service delivery and service environment. Later efforts by Dabholkar, Thorpe and Rentz (1996) and Brady and Cronin (2001) further advanced the conceptualisation of service quality towards a multidimensional, hierarchical construct to reflect the complexity of service quality evaluations.

In higher education, various research attempts have been made to measure service quality perception amongst students via the SERVQUAL model (e.g. Cuthbert 1996; O’Neill 2003; Soutar & McNeil 1996). However, the applicability of the five dimensions in the framework (i.e. reliability,
responsiveness, assurance, empathy and tangibles) for the education sector is questionable since
customisation is necessarily based on individual industries (Carman 1990; Cronin & Taylor 2001; Dabholkar, Thorpe & Rentz 1996). Cuthbert (1996) contends that SERVQUAL model is not
appropriate for the HE sector as HE services are more complex than other retail services such as
banking and restaurants. The conceptual and operational discrepancies found in the SERVQUAL
model have to some extent encouraged the application and development of alternative instruments in
service quality measurement for HE (e.g. Abdullah 2006; Joseph & Joseph 1997; Owlia & Aspinwall
1998).

Given the complex nature of educational services, this research study posits that service
quality perception in the educational sector is formed as a complex interaction of multi-dimensional
consideration and evaluation. Following Brady and Cronin (2001), it is proposed that the hierarchical
approach recognises the many facets and dimensions in service quality perceptions, and accounts for
the complexity of the human perceptions.

Outcome Valence

In psychology, the term ‘valence’ is used to refer to discuss emotions in an event, object or
situation. A positive valence refers to ‘good’ emotions such as ‘joy’ while a negative valence refers to
‘bad’ emotions such as ‘fear or anger’. Moods, feelings and emotions are acknowledged to be
important aspects of consumers’ behavior (Chen & Dubinsky 2003). Chen and Dubinsky (2003) found
that valence influences perceived customer value in online shopping and that customers use a ‘how-
do-I-feel-about-it’ heuristic as a source of information in assessing product quality and in making
purchase decisions.

In the service setting, valence suggests that the outcome of a service encounter is evaluated on a
continuum that ranges from good to bad (Brady et al. 2006). Brady and Cronin (2001) introduce
valence as a sub-dimension of outcome quality because it is believed that in certain contexts,
customers tend to evaluate their service encounter based on the outcome rather than the process or
interaction with the service employees. This observation is also reported in a recent study by Hellen
and Sääksjärvi (2010) who demonstrated how differently customers might perceive and evaluate the same service regardless of how it is provided, due to the individual’s state of happiness. The findings seem to concur with studies by Mogilner, Aaker and Kamvar (2012) and Tsai and Zhao (2011) who identified how valence forms a fundamental dimension of an individual’s choice and consumption experience.

Following the development in the literature, this study posits valence in one’s academic results as the moderator of the relationship between student motivation in higher education pursuit and his/her USQ evaluation. To test this relationship, the following hypothesis is developed:

H4: A student’s feelings towards his/her academic results will moderate the relationship between the different types of motivation and University Service Quality evaluation.

**METHODS OF STUDY**

**Survey Administration**

A questionnaire survey was carried out to verify the proposed construct for higher education service quality. As the term “higher education” may represent a broad category of institutions of higher learning such as university colleges, vocational institutions and community colleges, this study focuses on the universities as the scope for empirical investigation. The subjects for this study are a representative cross-section of full-time business undergraduate students at public universities, private universities and foreign university branch campuses in Malaysia. A sampling frame which consisted of a list of universities in Malaysia was obtained from the Ministry of Higher Education of Malaysia and permission was sought from the selected institutions for the survey administration. A total of 9 universities (4 public universities, 3 local private universities and 2 foreign branch campuses) agreed to participate in the questionnaire survey. The questionnaires were administered at the faculty of business of the participating universities via convenience sampling where students were largely approached in the class setting. Upon data cleaning and removal of missing data entries, a total sample of 1,164 respondents were used for data analysis. The sample respondent profile is presented in Table 1.
Measurement Scales

The Motivation for Higher Education Participation construct was measured by a 28-item scale which consisted of 7 subscales on the Academic Motivation Scale, i.e. intrinsic motivation (to know), intrinsic motivation (towards accomplishment) and intrinsic motivation (to experience stimulation), extrinsic motivation (identified regulation), extrinsic motivation (external regulation) and amotivation. The items were rated on a scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). Each subscale consists of four items each; thus, subscale scores could range from 4 to 28. A high score on a subscale indicated high endorsement of that particular academic motivation. The total scores for each distinct motivational type (autonomous motivation, controlled motivation and amotivation) are then derived from the corresponding subscales.

To measure University Service Quality perception, a hierarchical construct model adapted from Brady and Cronin (2001) is used for this study. The University Service Quality Evaluation is conceptualised as three primary dimensions consisting of Academic Services Quality, Administrative Services Quality and General Services Quality, while secondary dimensions and corresponding sub-dimensions largely consist of variables proposed by Brady and Cronin (2001). The design of questionnaire items for the primary dimensions (i.e. Academic Quality, Administrative Quality and General Services Quality) for this proposed model was referred from the items used for the primary dimensions used by Brady and Cronin (2001)( i.e. Interaction Quality, Physical Environment Quality and Outcome Quality). Adjustments were made to the sub-dimensions of Outcome Quality for Academic and Administrative Quality as the service outcome for these services was considered to be different from the retail industries investigated by Brady and Cronin (2001).

A 7-point semantic scale adapted from Brady et al. (2006) is used to measure academic outcome valence in the form of students’ feelings towards their academic results. The respondent is requested to indicate his/her feelings about the overall academic results attained in the course of study on a continuum ranging from bad (1) to good (7).
The internal consistency of the scales used in this study was preliminarily assessed with the use of the Cronbach’s alpha (>0.7 acceptable) and corrected item-total (>0.3 for items to be retained) to identify indicators which were not considered to represent a significant theoretical dimension (Pallant 2007) Overall, the Cronbach’s alpha values for all scales used in this study more than 0.7, which indicated adequate internal consistency.

**STRUCTURAL MODEL ANALYSIS**

Subsequent to the preliminary of reliability test using Cronbach’s alpha, confirmatory factor analysis (CFA) was undertaken to assess the relationships between observed variables and their underlying latent constructs (Harrington 2008). The overall process of the SEM analysis was consistent with a two-step approach recommended by Anderson and Gerbing (1988) whereby the first step involved the test of model fit and construct validity, followed by the testing of the structural model. The standards used for interpretation of the SEM results are presented in Table 2.

[Insert Table 2 about here]

**Test of Direct Effects**

To examine the impact of student’s degree of self-determination upon University Service Quality evaluation, the major motivation types advocated by the Self-Determination Theory were examined in relation to the proposed model. The three continuous variables of Total Autonomous Motivation Score, Total Controlled Motivation Score and Total Amotivation Score were then modeled as predictors to USQ evaluation according to the proposed model. Based on the review of literature, Autonomous Motivation was hypothesised to have a positive influence upon USQ evaluation (H1), while Controlled Motivation (H2) and Amotivation were postulated to have a negative influence upon USQ evaluation (H3).

From the results generated for the proposed structural model, the fit indices supported the adequacy of the structural model ($\chi^2$ (309) = 1799.843; p<0.01; GFI=0.886, AGFI=0.860, CFI=0.954, TLI=0.947, RMSEA=0.064). Based on the standardised path coefficients shown in Figure 1, it was found that Total Autonomous Motivation Score ($\beta = 0.29$) and Total Controlled Motivation Score ($\beta =$
positively influence USQ evaluation while no significant relationship was found between Total Amotivation Score and USQ evaluation. The magnitude of impact of Total Autonomous Motivation Score upon USQ evaluation was much greater than Total Controlled Motivation Score as those who are more self-determined in their reasons for higher education pursuit tend to have more favourable USQ experience.

Contrary to expectation, Controlled Motivation had a positive influence upon USQ evaluation. The positive relationship may be contributed by the rewards and external contingencies which compelled an individual to persist in the higher education demands and along with that, experience a favourable university service experience. Albeit a significant relationship, this however, was of a very small magnitude ($\beta = 0.09$). The insignificant relationship between the state of Amotivation and University Service Quality was not totally unexpected, because the state of helplessness and apathy an individual experienced may result to an unclear or undecisive evaluation of USQ. The above analysis therefore provided evidence in support of H1, but not for H2 and H3.

**Test of Moderating Effects**

In testing for H4, Outcome Valence was hypothesised to moderate the relationship between discrete motivational types and USQ evaluation. Based on the procedure recommended by Hair et. al (2006), the multigroup analysis via SEM was used to test moderating effects. Three groups are derived from the sample based on the 7-point semantic scale which indicates the student’s feelings over the academic results attained (1 indicates feeling bad and 7 indicates feeling ‘good’). The ‘Feel Good’ category are those who indicated ‘5’, ‘6’ and ‘7’ in the scale, the ‘Feel Bad’ category are those who indicated ‘1’, ‘2’ and ‘3’ while ‘Feel Okay’ category are those who indicate ‘4’ which is the middle point of the scale.

The significant paths in the structural model were first tested by allowing the hypothesised relationships to be estimated freely in both groups, followed by the subsequent test which was to add a constraint fixing the relationship between each discrete motivational types and USQ to be equal in
both groups. The unconstrained SEM output presented favourable model fit indices ($\chi^2 (927) = 2560.023; p<0.01; \text{GFI}=0.854, \text{AGFI}=0.821, \text{CFI}=0.947, \text{TLI}=0.940, \text{RMSEA}=0.039$). Upon the constraints added upon the paths from the each motivational type to USQ, it was observed that the model fit had worsened significantly ($\chi^2 (933) = 2575.529; p<0.01; \text{GFI}=0.853, \text{AGFI}=0.822, \text{CFI}=0.947, \text{TLI}=0.940, \text{RMSEA}=0.039$) (Refer to Table 3). This observation provided evidence in support of the moderating effect of academic outcome valence in the interaction between motivational types and USQ.

[Insert Table 3 about here]

Based on the standardised coefficients of the different groups of respondents, the results displayed in Table 4 indicated that for those who reported feeling good about their academic results, the degree of autonomous motivation and controlled motivation has a positive impact upon USQ experience. Bearing in mind the positive correlation between autonomous motivation(0.315, $p<0.01$), controlled motivation (0.237, $p<0.01$) and the outcome valence ratings, those who reported feeling good in their academic results tend to be more self-determined and this would lead to a more favourable perception in USQ. For this group of students, the rewards and external contingencies which are tied to the academic achievements, for instance to secure a desired employment or to fulfill parental expectations, may compel the individual to persist in the higher education demands and this may also lead to a favourable university service experience, albeit in a lesser magnitude.

[Insert Table 4 about here]

For students who feel ‘okay’ over their academic results, they would experience a positive USQ experience, if they are highly internalised in their decision to undertake a higher education pursuit. However, for students who reported feeling bad over their academic results, the level of autonomous motivation and controlled motivation does not seem to have a significant impact upon their USQ experience. Drawing from the correlation coefficients which indicate a positive correlation between autonomous motivation(0.315, $p<0.01$), controlled motivation (0.237, $p<0.01$) and outcome valence ratings; and a negative correlation (-0.166, $p<0.01$) between amotivation and outcome valence ratings, those who feel bad tend to have low autonomous motivation, low controlled
motivation and high degree of amotivation. As explained earlier, these individuals may be in a state of helplessness and apathy and hence, resulting to an unclear or undecisive evaluation of USQ.

DISCUSSION AND CONCLUSION

The structural model analysis provided additional insights based on the three major forms of motivation, with ‘Autonomous Motivation’ being the most self-determined, followed by ‘Controlled Motivation’, and ‘Amotivation’ being the least self-determined form of motivation. The path analysis showed that both Autonomous Motivation and Controlled Motivation positively influenced USQ evaluation while no significant relationship was found between Amotivation and USQ evaluation. It was observed that Autonomous Motivation had a much greater impact upon USQ evaluation compared to Controlled Motivation, and this emphasised the importance of a self-determined form of motivation towards the appreciation of one’s USQ experience.

It was also worth noting that, contrary to expectation, Controlled Motivation positively predicted USQ evaluation despite the fact that it was a less self-determined form of motivation. This finding is in line with Ntoumanis’ (2001) and Vallemard, Fortier and Guay’s (1997) contention that Introjected Regulation (which is classified under Controlled Motivation) may result in positive consequences in terms of behavioural persistence and engagement in educational activities for the fear of social alienation. This persistence may then result to a greater sense of belonging and appreciation of the university experience. The initial hypothesis which postulated a negative relationship between Amotivation and USQ evaluation was not supported. The insignificant relationship between the state of Amotivation and University Service Quality evaluation was not entirely surprising because the state of helplessness and apathy an individual experiences may result in an unclear or undecisive evaluation of USQ.

From the findings of this study, it is established that USQ perception is subject to individual characteristics such as their degree of self-determination in higher education pursuit and outcome valence. In a particular service setting, the students may perceive their USQ experience differently from one another although they may be experiencing the same level of service standards. Someone
with a greater degree of autonomous motivation and feeling good over their results tends to have a more optimistic view in their USQ perception, relative to someone who feels controlled or helpless in participating in higher education pursuit. For individuals who report of feeling good about their academic results, the level of autonomous motivation and controlled motivation tend to have a positive impact upon USQ experience while for individuals who feel neutral over their academic results, they may experience a favourable USQ experience if they are autonomously motivated in their higher education participation.

The results of this study highlight important implications in the administration and management of service quality standards in the universities. While student satisfaction survey is important to assess students’ perception in university services, it is suggested that these indicators need to consider the effect of valence in terms of students’ feelings towards their academic results. Careful considerations need to be undertaken with the use of these satisfaction ratings for staff appraisal. This study shares Brady et al.’s (2006) view that, in a valence-oriented industry, employee reward systems should not be tied directly to satisfaction ratings. This is because in a valence-oriented industry such as higher education, service outcome (e.g. grades received) plays a primary role in determining quality perception. The failure to account for valence can potentially lead to misguided behavior such as the inflation of grades offered or an ‘overly helpful’ attitude which compromises the principle of independent learning.

Additionally, the findings indicate that a student’s motivational disposition in higher education participation has a direct influence upon perceived USQ and this should be accounted for in the effort of service quality management. It is important for the universities to understand the antecedent conditions of USQ perception, instead of merely focusing on the ratings or outcome of USQ evaluation. Therefore, the findings of this study necessitate careful consideration to be given in terms of managing students’ prior expectations before enrolment which arise from their motivational dispositions.
REFERENCES


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TABLES AND FIGURE GRAPHICS

Table 1: Sample Respondent Profile

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>340</td>
<td>29.2</td>
</tr>
<tr>
<td>Female</td>
<td>824</td>
<td>70.8</td>
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<tr>
<td>Nationality</td>
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<td></td>
</tr>
<tr>
<td>Local students</td>
<td>1021</td>
<td>87.7</td>
</tr>
<tr>
<td>International students</td>
<td>143</td>
<td>12.3</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 20 years</td>
<td>164</td>
<td>14.1</td>
</tr>
<tr>
<td>20-24 years</td>
<td>949</td>
<td>81.5</td>
</tr>
<tr>
<td>25-29 years</td>
<td>50</td>
<td>4.3</td>
</tr>
<tr>
<td>More than 29 years</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Year of Study</td>
<td></td>
<td></td>
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<tr>
<td>First year undergraduates</td>
<td>319</td>
<td>27.4</td>
</tr>
<tr>
<td>Second year undergraduates</td>
<td>432</td>
<td>37.1</td>
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<tr>
<td>Final year undergraduates</td>
<td>413</td>
<td>35.3</td>
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Table 2: Standards of Interpretation Used During Confirmatory Factor Analysis and Structural Model Analysis

<table>
<thead>
<tr>
<th>Analysis step</th>
<th>Criteria Applied</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability checks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scale</td>
<td>Alpha value &gt;0.70</td>
<td>Pallant (2007)</td>
</tr>
<tr>
<td>Item</td>
<td>Check Inter-item correlation matrix to ensure items are measuring the same underlying characteristics, and not redundant items (&lt;0.9)</td>
<td>Lelliot et al. (2008)</td>
</tr>
<tr>
<td></td>
<td>Corrected item-to-total &gt;0.3</td>
<td>Hair et al. (2006)</td>
</tr>
<tr>
<td></td>
<td>‘Alpha-if-item deleted’ used to check for potential scale improvement</td>
<td></td>
</tr>
<tr>
<td>Confirmatory Factor Analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preliminary checking</td>
<td>Standardised loading estimates &gt;0.5 (acceptable), ideally should be &gt;0.7</td>
<td>Hair et al. (2006)</td>
</tr>
<tr>
<td>Assessing Construct Validity</td>
<td>Measures of fit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chi-square/df to be reported, although CMIN&lt;2 to &lt;5 is usually associated with better-fitting models, it is however not appropriate for large sample size (&gt;250).</td>
<td>Marsh &amp; Hocevar (1986)</td>
</tr>
<tr>
<td></td>
<td>Hence other indicators used are: GFI &amp; AGFI &gt;0.8; TLI &amp; CFI &gt;0.9</td>
<td>Tabachnick &amp; Fidell (2007)</td>
</tr>
</tbody>
</table>
### Analysis step

<table>
<thead>
<tr>
<th>Criteria Applied</th>
<th>Source</th>
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<tbody>
<tr>
<td>RMSEA &lt;0.05 indicate good fit, &lt;0.08 indicate reasonable fit.</td>
<td>Hair et al. (2006)</td>
</tr>
<tr>
<td>Composite reliability of scales &gt;0.7</td>
<td>MacCallum et al. (1996)</td>
</tr>
<tr>
<td>Variance extracted &gt;0.5</td>
<td>Hair et al. (2006)</td>
</tr>
<tr>
<td>Low to moderate correlations (r&lt;0.9) among factors indicate acceptable discriminant validity.</td>
<td>Hair et al. (2006)</td>
</tr>
<tr>
<td>Hair et al. (2006)</td>
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<tr>
<td>Hair et al. (2006)</td>
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<td>Gajeswski et al. (2010)</td>
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### Structural Model Analysis

<table>
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<tr>
<th>Measures of fit</th>
<th>Source</th>
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<tr>
<td>Criteria to assess model fit same as above.</td>
<td>Hair et al. (2006)</td>
</tr>
<tr>
<td>Path coefficients need to be significant at p&lt;0.05 for retention</td>
<td>Hair et al. (2006)</td>
</tr>
<tr>
<td>Comparison of $\chi^2$ and $df$ difference between constrained and unconstrained models. Significant difference (p&lt;0.05) in worse model fit indicates the existence of moderating effect.</td>
<td>Hair et al. (2006)</td>
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</table>

### Table 3: Moderation Test of Academic Outcome Valence upon Interaction Between Discrete Motivational Types and University Service Quality

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$\chi^2$ difference test</th>
<th>$\Delta\chi^2$</th>
<th>$\Delta df$</th>
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</thead>
<tbody>
<tr>
<td>Constrained</td>
<td>2575.529</td>
<td>933</td>
<td>15.506 (&gt;15.033, p&lt;0.02)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Unconstrained</td>
<td>2560.023</td>
<td>927</td>
<td></td>
<td></td>
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</table>

### Table 4: Standardised Coefficients Based on Different Groups

<table>
<thead>
<tr>
<th>Path</th>
<th>Feel Good</th>
<th>Feel ‘Okay’</th>
<th>Feel Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous Motivation -&gt; USQ</td>
<td>0.237***</td>
<td>0.243***</td>
<td>0.206 (n.s.)</td>
</tr>
<tr>
<td>Controlled Motivation -&gt; USQ</td>
<td>0.122**</td>
<td>0.073 (n.s.)</td>
<td>0.006 (n.s.)</td>
</tr>
</tbody>
</table>

*Note: *** significant at p<0.001; ** significant at p<0.01; n.s. = non-significant*
Figure 1: Structural Model Analysis