*IIUC Studies* 18
DOI: https://doi.org/10.3329/iiucs.v18i1.61275

# SEM Model to analyze the factors affecting university image: A study on International Islamic University Chittagong

Mohammad Manjur Alam
*Department of Computer Science and Engineering*
*International Islamic University Chittagong (IIUC), Bangladesh*

## Abstract

Private higher education institutions (PHEIs) have emerged as more competitive and stimulating day by day due to alternative accessibility and availability. University management ensures a global image to meet their stakeholders and social expectations. This study sets out to identify factors affecting university image by developing a structural equation model. A proposed model of overall university image formation through structural equation modeling, 310 respondents have been collected by using a five-point Likert scale questionnaire. Descriptive statistics, correlation, confirmatory factor analyses, and structural equation modeling were run to evaluate factors affecting overall image in IIUC. Based on the findings, all factors measured in this study have a positive significant effect on the overall university image. This research also explored that non-academic and management image is the most important predictors from the IIUC context. The model explains the overall university image well (61% of the total variation). This study is important for future marketing and better strategic plan to meet the needs of IIUC stakeholders as well as other HEIs in Bangladesh.

**Keywords** University image, HEIs, Students, IIUC, Bangladesh

**Paper type** Research paper

## 1. Introduction

The overall image of the university may be defined as the collection of students' psychological attitudes that affect them to precise a pragmatic or unrealistic view regarding institution (Alcaide-Pulido, Alves, & Gutierrez-Villar, 2017). Each higher education institutions (HEIs) desires a brand image that is dependable and supposed to be distinguished from others. Today, it is a major concern for private higher education institutions (PHEIs) in Bangladesh. Private universities in Bangladesh face a frequent, countless, and inconsistent set of demands from stakeholders. Stakeholders refers to the students and parents, employers, academics administrators, university management, national & international societies, government and its organizations, mass media, local and global evaluation bodies and depositors (Alcaide-Pulido, Alves, &

IIUC Studies
Vol. 18, Dec. 2021
pp. 65-88

ISSN 1813-7733

Gutierrez-Villar, 2017). Thus, PHEIs needs to improve its image exclusively to be beneficial to its stakeholders.

The image of the HEIs may connect to stakeholders on the following dimensions: a) what type of institution. b) What are their demands? For generating its potentiality to begin, a strong means of assisting authority regarding policymaking and decision (Chapleo, 2015). However, a major study on the university image has focused on the student viewpoint. For example, Aghaz, Hashemi, and Atashgah (2015) observed that the image of the university had a significant impact on students' faith in their institution. According to Arpan, Raney and Zivnuska (2003) and Duarte, Alves and Raposo (2010), institutional image is a significant feature in choosing the universities for students. Some researchers specify that students are one of the most powerful spectators for HEI's (Mainardes, Alves, & Raposo, 2012; Guilbault, 2016). Few studies found that the university image may vary subject to the identifying audience (Vidaver-Cohen, 2007; Duarte, Alves, & Raposo, 2010; Wilkins & Huisman, 2015; Aghaz, Hashemi, & Atashgah, 2015). In addition, Studies observed that institution image has a positive and significant influence on enrolling students, enthusiasm, retention, and encouraging their employees. In this connection, most of the HEIs around the world have employed advertising philosophies and models to increase competitive rewards (Hemsley-Brown & Oplatka, 2006) and establish a good image in HEIs.

At an increasing rate, Bangladesh has 107 private universities with a total number of 4500000 students enrolled in these universities (UGC: 2020). The quality assertion has become a progressively desirable issue due to the rapid growth of the universities in this territory. Many of these universities have no appropriate campus and providing degenerate education. They have no proper infrastructure, lack of an adequate number of full-time faculty, inadequate laboratory, library, and research facilities. As the competition in this sector is increasing (Berry & Cassidy, 2013), it should improve the image of private universities to ensure their quality educations. Existing literature evidence that numerous studies have been conducted in Bangladesh on the organizational image from a business stance that ignored image on university viewpoint (Alam & Noor, 2020; Khan, Ali, & Arefeen, 2014; Khan, Islam, & Ali, 2014; Rahman, 2012; Hafez, 2018; Uddin & Khan, 2017; Uddin, Khan, & Solaiman, 2014). Thus, there is a knowledge gap in the literature in terms of university image in Bangladesh. In addition, it is an innovative, challenging, and interesting issue in the case of private universities in Bangladesh due to the alternative accessibility and availability of students. Students can choose one institution after another for quality education, and

they can expect more from the university. With this context, PHEIs need to improve their strategies and overall university image to continue on this ground. So, this study intends to develop a model using the SEM to analyze the factors affecting IIUC's image in the hope of establishing a better strategic plan to meet the needs of IIUC stakeholders as well as other HEIs in Bangladesh.

## 2. Literature review

### 2.1. University image concept

Every institute has an image irrespective of whether it is good or bad that will create an establishment's success (Gregory & Wiechmann, 1999). The idea of university image is a diverse concept depend on the influ¬ence of a various perspective that turned into academics (Luque-Martínez & Barrio-García, 2009; Aghaz, Hashemi, & Atashgah, 2015). Even in the same organization influences the underlying dissimilar image. Although the corporate image is essential to invite potential people, increase purchasing and buyer satisfaction, develop constancy and growing functionality (Sung & Yang, 2008). Image of the university would be a precarious issue operating custom of the student's (Weissman, 1990; Nguyen & LeBlanc, 2001). Treadwell and Harrison (1994) and Theus (1993) stated that the image of the university plays a vital role in absorbing good students. According to Gafoor and Ashraf (2012), university image mainly depends on the (a) subjective concern; (b) program quality; (c) social and physical atmosphere of the institution. Duarte, Alves, & Raposo, (2010) and Zaghloul, Hayajneh and AlMarzouki (2010) defined the collection of all the principles of the individual that contributes towards the university image. Hence, the image of the university is differed in various ways worldwide and is presented disparately in educations (Curtis, Abratt, & Minor, 2009). The most emphasized definition of an institutional image has been accompanied by Kazoleas, Kim and Moffitt (2001) and Arpan, Raney and Zivnuska (2003). They found the image of the university mainly depends on the following factors: (a) programs of the university; (b) quality teaching and research; (c) causes of environment; (d) tuition; (e) sports; and (f) overall image of the university. Further Ali-Choudhury, Bennett and Savani (2009) emphasizes new recruitment of universities because without new recruitment universities will not survive despite many important stakeholder consists. Therefore, the idea about university image is defined as the assessments that the various stakeholder's concepts, opinions, observations, and feelings resulted from the reaction of a faithful expression over the period.

2.2. Factors influence university image

It is difficult to identify all factors contributing to overall intuitional image even out if we classify total significant factors, it is still challenging to regulate which items are interrelated with all others (Sung & Yang, 2008). Despite extensive literature has found about foreign university image, no literature has found so far, such an important concept factor affecting university image in Bangladesh. However, a major part of the studies explored factors affecting students' satisfaction and corporate image in Bangladesh (Alam, Billah, & Alam, 2014; Hafez, 2018; Rahman, Mia, Ahmed, Thongrak, & Kiatpathomchai, 2020; Khan & Ali, 2012; Khan, Toy, & Siddique, 2010; Uddin, Khan, Uddin, & Solaiman, 2015; Uddin, Ali, & Khan, 2018; Alam & Noor, 2020). A review of the literature designated that, three established factors are important for identifying university image these are (i) academic qualities; (ii) athletic powers; and (iii) mass media exposure: but only academic qualities were stable across these clusters (Arpan, Raney, & Zivnuska, 2003). Theus (1993) identified various factors that influence the university image such as (i) the dimension of the university's; (ii) place; (iii) appearance; (iv) program; (v) financial ability; (vi) variety amongst students; (vii) climate; (viii) distinctiveness; and (ix) the number of services delivered by the university. Among the various influential factors related to the university image construction Gutman and Miaoulis (2003) stated four categories factors: (i) institutional; (ii) academic; (iii) community; and (iv) individual. Numerous studies found university image involve to the student concern (Palacio, Meneses, & Perez, 2002; Sung & Yang, 2008, Zaghloul, Hayajneh, & AlMarzouki, 2010; Mackelo & Drūteikienė, 2010; Polat, 2011). The behavior and approach of the university authorities can affect the perceived image of the students (Jenkins, 1991; Alessandri, 2001; Duarte, Alves, & Raposo, 2010). Also, alumni and graduate students play a significant role in determining the satisfactory or dissatisfactory university image (Jenkins, 1991; Alessandri, 2001; Duarte, Alves, & Raposo, 2010; Khanna, Jacob, & Yadav, 2014). Few studies illustrated that image of the HEIs related to accommodation facilitates (Martínez, Blasco, & Moreno, 2015). Nevertheless, several studies identified university image related to the non-academic or administrative perspective (Fernández & Trestini, 2012). Zaghloul, Hayajneh, and AlMarzouki (2010) found that (a) educational quality; (b) teaching; (c) quality of staff; (d) transport facility; and (e) the tuition fees are the most significant variables to measure university image. Duarte, Alves, & Raposo, (2010) reflect that (a) physical premises; (b) lecturer quality; (c) overall teaching quality; and (d) the countrywide academic reputation influences institutional image. Finally, Mackelo and Drūteikienė

(2010) point out that the most significant factors influencing the image of a HEIs are (a) outcome-based education; (b) preferred job; (c) curriculum standards; (d)quality requirements; (e) mass media communication; (f) The overall picture of the university is its position and identity; (g) public recognition; and (h) gratitude to its staff.

2.3. Determination of items and scale

To analyze the factors affecting overall university image by developing a structural equation model, we considered four factors including twenty items based on a review of the literature as well as items relevant to the International Islamic University Chittagong (IIUC). These four instruments are (a) academic image; (b) non-academic image; (c) management image; and (d) overall university image. The scale of the academic image consists of four items: (i) program quality (Theus, 1993; Kazoleas, Kim, & Moffitt, 2001; Duarte, Alves, & Raposo, 2010; Gafoor & Ashraf, 2012); (ii) teaching quality (Ivy, 2001; Kazoleas, Kim, & Moffitt, 2001; Luque-Martínez & Barrio-García, 2009; Zaghloul, Hayajneh, & AlMarzouki, 2010; Duarte, Alves, & Raposo, 2010; Gafoor & Ashraf, 2012); (iii) research facility (Treadwell & Harrison, 1994; Arpan, Raney, & Zivnuska, 2003; Luque-Martínez & Barrio-García, 2009; Duarte, Alves, & Raposo, 2010); and (iv) career facility (Zaghloul, Hayajneh, & AlMarzouki, 2010; Duarte, Alves, & Raposo, 2010; Bakanauskas & Sontaite, 2011).

The non-academic scale is also measured with four items: (i) Administrative and support services (Arpan, Raney, & Zivnuska, 2003; Luque-Martínez & Barrio-García, 2009; Fernández & Trestini, 2012); (ii) library & seminar facilities (Polat, 2011); (ii) medical and physical facilities (Reid, 1973); and (iv) internet facilities (Castillo, Durán, & Jiménez, 2013).

The scale that considers the management image are: (i) campus security and environment (Soutar & Turner, 2002; Palacio, Meneses, & Perez, 2002; Gutman & Miaoulis, 2003; Gray, Fam, & Llanes, 2003; Arpan, Raney, & Zivnuska, 2003; Duarte, Alves, & Raposo, 2010); (ii) accommodation (Belanger, Mount, & Wilson, 2002; Arpan, Raney, & Zivnuska, 2003; Gray, Fam, & Llanes, 2003; Duarte, Alves, & Raposo, 2010; Khanna, Jacob, & Yadav, 2014; Martínez, Blasco, & Moreno, 2015); (iii) affordable tuition fees (Kazoleas, Kim, & Moffitt, 2001; Palacio, Meneses, & Perez, 2002; Gray, Fam, & Llanes, 2003); (iv) transport facility (Zaghloul, Hayajneh, & AlMarzouki, 2010); (v) canteen facility (Kazoleas, Kim, & Moffitt, 2001); and (vi) sports facility (Kazoleas, Kim, & Moffitt, 2001; Arpan, Raney, & Zivnuska, 2003; Fernández & Trestini 2012).

Finally, overall university image consist of a (i) global reputation of the university (Theus,1993; Soutar and Turner, 2002; Belanger, Mount, & Wilson, 2002; Gutman & Miaoulis, 2003; Arpan, Raney, & Zivnuska, 2003; Aghaz, Hashemi, & Atashgah, 2015); (ii) alumni (Duarte, Alves, & Raposo, 2010; Wilkins & Huisman, 2015); (iii) students' satisfaction (Ivy, 2001; Palacio, Meneses, & Perez, 2002; Arpan, Raney, & Zivnuska, 2003; Sung & Yang 2008; Mackelo & Drūteikienė, 2010; Zaghloul, Hayajneh, & AlMarzouki, 2010; Polat, 2011; Castillo, Durán, & Jiménez, 2013; Guilbault, 2016; Mallika & Torii, 2019); (iv) employees' satisfaction (Castillo, Durán, & Jiménez, 2013; Guilbault, 2016); (v) social acknowledgment (Belanger, Mount, & Wilson, 2002; Gutman & Miaoulis, 2003; Luque-Martínez & Barrio-García, 2009; Bakanauskas & Sontaite, 2011); and (vi) distance from the city (Reid, 1973; Ivy, 2001; Palacio, Meneses, & Perez, 2002; Zaghloul, Hayajneh, & AlMarzouki, 2010).

Items considered in this study have been selected by the most occurring factors in many research studies as well as IIUC's perspective. All Items are measured by a five-point Likert scale from strongly disagree to strongly agree (ranges from 1 to 5). Ivy (2001) started the first modeling conception about the overall university image. However, as far as there is no established model for assessing factors affecting HEIs image. Thus, the main purpose of this study is to analyze factors affecting overall university image by developing a structural equation model.

### 2.4. Research questions and objectives

The main goal of this study is to develop a consistent SEM model to analyze the factors affecting the overall image in HEIs. Thus, the study seeks to answer the research question as -

What factors contribute to the development of a persistent SEM model in PHEIs?

However, based on the purpose and its importance, the specific objectives of this research work are given below:

a. To know the background characteristic of the survey respondents;
b. To identify the direct effect of different image factors on PHEIs;
c. To identify the direct and indirect effects of overall university image;
d. Finally, to identify the various factors that contribute to the overall university image by establishing a consistent a structural equation model (SEM).

2.5. Conceptual model and hypotheses

According to the above literature and PHEIs concept of Bangladesh, the hypothesized conceptual model of this research is as follows:

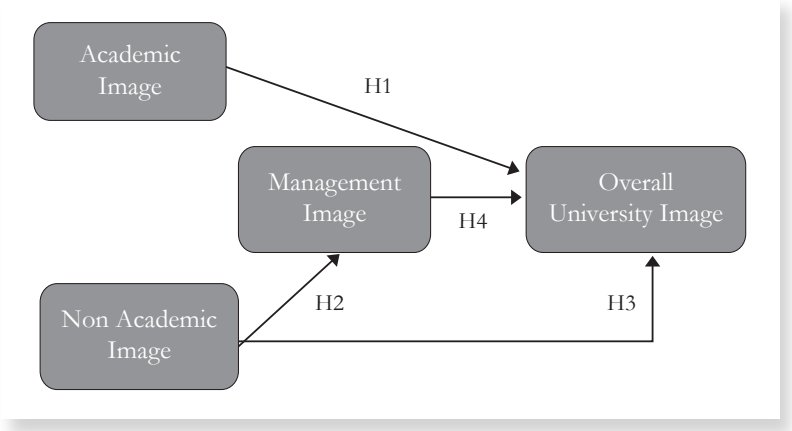


Figure 1: Conceptual Model for Measuring Overall University Image;
**Source:** Hypothesized by the researcher

Based on the conceptual model (see Figure 1), the following hypotheses have been developed:

*H1: Academic Image has a direct and significant impact on overall university Image.*
*H2: Non-Academic Image has a direct significant effect on management Image.*
*H3: Non-Academic Image has a both direct and indirect significant influence on overall University Image.*
*H4: Management Image has a direct and influence on overall university Image.*

## 3. Methodology

3.1. Sampling frame and study design

The study was implemented by a quantitative technique that utilized a descriptive study design, including the use of questionnaires. In this study, the list of private universities in Bangladesh was taken to draw the sampling frame. Students of all the private universities of Bangladesh were the target population in this study. A two-stage cluster sampling design was considered to select the respondents for conducting this survey. Based on the complete and up-to-date frame of 106 private universities in Bangladesh, a simple random sampling (SRS) method was applied to select one university. The name of the selected university is International Islamic University

Chittagong (IIUC), which is the first stage sampling (FSU) and then among the students of IIUC is the ultimate sampling units (USU).

3.2. Questionnaire development and data collection

The data were collected from current and alumni students of International Islamic University Chittagong (IIUC). This is one of the top-class private universities in Bangladesh established in 1995 as approved by the Government of Bangladesh (Wikipedia, 2021). Currently, it has 14000 students from home and abroad and 370 teachers (IIUC, 2020). Data collected via an online survey in November 2020. A total of 310 respondents were collected including 44 incomplete responses that were eliminated from the study. According to Kline (2011), the size of a typical sample in a study using SEM is about 200 cases.

The questionnaires prepared for this research were prepared into two parts. In "Part A", the demographic profiles and background information of the students' were collected. Part A consists of five questions that are student's status, gender, age, program level, cumulative grade point average (CGPA). Duarte, Alves, and Raposo (2010) categorized university image consist of four factors with institutional, academic, individual, and social factors. However, the present study offered a new dimension including four main factors as academic image, non-academic image, management image, and overall university image, and 20 sub-factors. Thus, in "Part B", we have considered four main factors including 20 items to measures the overall image of IIUC based on a Likert scale question (five-point) indicating 1 means "strongly disagree" and 5 means "strongly agree". The scale of the items consists of two independent variables (total 8 items), one mediating variable (6 items), and one dependent variable (6 items). Two dependent variables are academic image and non-academic image, mediating variable and dependent variables are management image and overall image of the university.

3.3. Data analysis technique and statistical tools

Data analysis was carried out model development and hypotheses testing. To measure the factors affecting university image, a suggested model is developed with confirmatory factor analysis (CFA), testing validity and reliability, and correlation. Afterward, structural modeling (SEM) is performed to test hypotheses. CFAs were run to evaluate the convergent and discriminant validity of the latent factors. Different fit indices are used in the literature. We only used the most common indices. The analysis of data was carried out by IBM SPSS-Amos (version 24.0) and Python Visualization

Library (Seaborn and Matplotlib) was used to draw various charts and graphs.

## 4. Data analysis and results

### 4.1. Demographic profile

Table 1 demonstrates the background profile of current and graduate student's contributing in this survey. Among the respondents, 175 (56.5%) are male participants and 135 (43.5%) are female students. 31.6% of students' age is less than 23 years, 46.5% of students' age is 23 to 25 years and rest of the students' age is larger than 25 years. According to the program, the highest number of students had a science and engineering faculty (51.3%), followed by business studies (25.5%), and Arts and Humanities (23.2%). Most of the respondents are in undergraduate programs (71.2 %) followed by Masters (15.2%) and Alumni (12.9%). 50.3% students CGPA ranges from 3.01 to 3.50 and only 22.3% of students CGPA had greater than 3.5.

Table 1: Background characteristic of the students

| Variable | Frequency (N) | Percentage (%) |
|---|---|---|
| Gender | | |
| Male | 175 | 56.5 |
| Female | 135 | 43.5 |
| Students Age | | |
| <23 98 | 31.6 | |
| 23-25 | 144 | 46.5 |
| 25> 68 | 21.9 | |
| Department | | |
| Science and Engineering | 159 | 51.3 |
| Business studies | 79 | 25.5 |
| Arts and Humanities | 72 | 23.2 |
| Program Level | | |
| Undergraduate | 220 | 71.0 |
| Masters | 47 | 15.2 |
| Diploma | 3 | 1.0 |
| Alumni | 40 | 12.9 |
| CGPA | | |
| ≤ 3.0 | 85 | 27.4 |
| 3.01-3..5 | 156 | 50.3 |
| 3.51-4.00 | 69 | 22.3 |
| Total | 310 | 100.0 |

Source: Calculated from survey data

4.2. Measurement model (MM)

In the measurement model, confirmatory factor analyses (CFA) is the initial part of applying the SEM approach. Table 1 gives the summary output of the measurement model. The various fit indices of the CFA model are found acceptable levels. For example, the $x^2$ value of the MM is 260.665, and degree of freedom (df) is 160 and the ratio of $x^2$ over df is 1.629 (≤ 3). The value of $x^2$ in AMOS is called CMIN. The minimum discrepancy per degree of freedom (CMIN / DF) is less than 3 specify that the model's overall fit is within tolerable limits (Meydan & Sesen, 2011). The goodness-of-fit index (GFI) value is 0.924 Also, the root mean squared error approximation (RMSEA) of the model is 0.045 (<0.08; Hair, Black, Babin, & Anderson, 2010). The value of adjusted goodness-of-fit index (AGFI) is 0.901. Byrne (2001) specify that a value closes to 1 measure good fit. The AGFI value of 0.901 is satisfactory for the measurement model. From Table 2, the values comparative fit index (CFI) and normed fit index (NFI) are found acceptable limit (> 0.90; Hair, Black, Babin, & Anderson, 2010).

Table 2: CFA model fit summary

| **Fit Measures** | **Fitted Model** | **Recommended Level** |
|---|---|---|
| $x^2$ (df) 260.665(160) | | |
| CMIN/DF (P-value) | 1.629(0.000) | $x^2$ / df ≤ 3 |
| GFI | 0.924 | ≥0.85 |
| AGFI | 0.901 | ≥0.85 |
| RMSEA | 0.045 | ≤ 0.08 |
| NFI | 0.934 | ≥0.90 |
| CFI | 0.973 | ≥0.90 |

Source: Calculated from survey data

Table 3 illustrate the standard factor loadings of the CFA of each of the items along with standard error (SE) and critical ratio (C.R.). According Hair, Black, Babin and Anderson (2010) the threshold value of factor loading must be at least 0.50 while the classical value is 0.70 or greater and Construct Reliability (CR) should be larger than 0.70. Therefore, the convergent validity of the scales is tested. From Table 3 we have seen that factor loadings found in this study are higher than the threshold value of 0.50 and CR values are greater than 0.70. The factor loading is above 0.5 is measures confirmation of convergent validity.

Table 3: Results of CFA

| Items | Scale | Standardized Factor Loading | Unstandardized Factor Loading | Standard Error | t-value (C.R.) |
|---|---|---|---|---|---|
| ACA1 | Academic Image | 0.768 | 1.073 | 0.084 | 12.84 |
| ACA2 | | 0.790 | 1.007 | 0.077 | 13.142 |
| ACA3 | | 0.790 | 1.032 | 0.079 | 13.031 |
| ACA4 | | 0.738 | 1 | | |
| MNG1 | Management Image | 0.805 | 1 | | |
| MNG2 | | 0.81 | 1.067 | 0.068 | 15.625 |
| MNG3 | | 0.751 | 0.888 | 0.062 | 14.242 |
| MNG4 | | 0.819 | 1.084 | 0.068 | 15.919 |
| MNG5 | | 0.746 | 0.938 | 0.067 | 14.053 |
| MNG6 | | 0.73 | 0.976 | 0.071 | 13.679 |
| NAC1 | Non Academic Image | 0.758 | 0.965 | 0.069 | 13.958 |
| NAC2 | | 0.832 | 1.148 | 0.073 | 15.614 |
| NAC3 | | 0.875 | 1.177 | 0.072 | 16.454 |
| NAC4 | | 0.790 | 1 | | |
| OIG1 | Overall University Image | 0.720 | 1 | | |
| OIG2 | | 0.739 | 0.96 | 0.054 | 17.791 |
| OIG3 | | 0.781 | 0.893 | 0.068 | 13.17 |
| OIG4 | | 0.838 | 1.097 | 0.077 | 14.175 |
| OIG5 | | 0.815 | 0.967 | 0.071 | 13.688 |
| OIG6 | | 0.808 | 1.026 | 0.075 | 13.636 |

Source: Calculated from survey data. For all $p<0.01$

Table 4: Descriptive statistics, correlation coefficient, reliability results and discriminant validity

| | Mean | SD | ACA | NAC | MNG | OIG | VIF |
|---|---|---|---|---|---|---|---|
| ACA | 2.949 | 1.049 | (0.772) | - | - | - | 1.417 |
| NAC | 3.229 | 0.993 | 0.486 | (0.815) | - | - | 1.451 |
| MNG | 3.258 | 0.992 | 0.437 | 0.458 | ( 0.787) | - | 1.369 |
| OIG | 3.064 | 1.009 | 0.368 | 0.422 | 0.521 | (0.779) | - |
| Cronbach's Alpha (α) | | | 0.922 | 0.921 | 0.920 | 0.921 | - |
| Construct Reliability | | | 0.784 | 0.818 | 0.890 | 0.886 | - |
| AVE | | | 0.596 | 0.664 | 0.619 | 0.608 | - |

Source: Calculated from survey data. * P< 1%; the diagonal elements within brackets represent the square root of the AVE values.

Table 4 shows the average, standard deviations, AVE, Cronbach's α (CA), CR, discriminant validity, and correlations between the constructs used in this study. The mean of all dimensions had above the midpoint on the 5-point Likert scales with its standard deviations ranged from 0.992 to 1.049. Cronbach's α designed by using the reliability scale of the SPSS 24 program. The AVE and CR values are found by calculating the results of the CFA standard factor loadings into the formulas.

The value of AVE in our analysis is larger than 0.50 (Fornell & Larcker, 1981). Therefore, the results of the AVE in Table 4 had proven the satisfactory criteria. The result of correlation analysis shows that all constructs are significantly and positively related with each other at 0.01 levels. Hair, Black, Babi, and Anderson (2010) recommended that correlations are above 0.30 are appropriate for factor analysis. He also suggests that if the pairwise correlation value is above 0.80 then a multicollinearity problem exists. The graph of the scatter matrix of this study shows that the highest value of the pairwise correlation is 0.521. Hence, no multicollinearity exists among the variables. The value of the variance inflation factor (VIF) in table 3 and box plot indicate the data has no outlier.

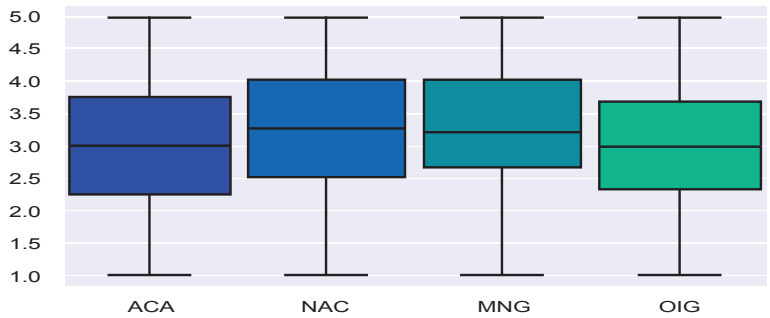


Figure 2: Box plot of detecting outlier; Source: Compiled by survey data.

The diagonal value in Table 4 is the square root of the AVE values and it is higher than the correlations (off-diagonal) for each dimension. Therefore, all the latent variables show satisfactory discriminant validity. In addition, Cronbach α and CR values are higher than the limiting value of 0.70. The acceptable and satisfactory value of CA is larger than 0.7 (Hair, Black, Babi, & Anderson, 2010; Nunnally, 1994).

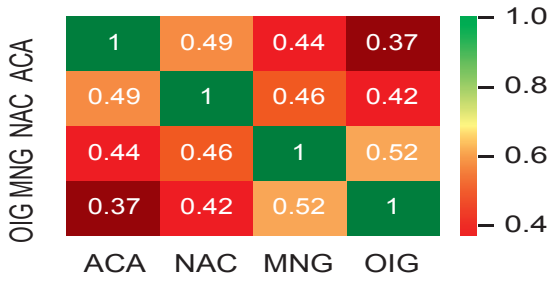


Figure 3: Scatter Matrix Source; Source: Compiled by survey data.

4.3. Test for structural equation model (SEM)

To identify important factors related to university image SEM is employed in this research. The main advantage of SEM is that it can visualize data and hypotheses in a realistic model.

Table 5: Fit indices for SEM

| Indices | Model Performance | Acceptable Limit |
|---|---|---|
| $x^2$ (*df*) | 309.543(163) | |
| CMIN/DF | 1.899 | 3 ≤ |
| GFI | 0.912 | ≥ .85 |
| AGFI | 0.886 | ≥ .85 |
| CFI | 0.961 | ≥ 0.90 |
| NFI | 0.922 | ≥0.90 |
| RMSEA | 0.054 | 0.08 ≤ |

Source: Calculated from survey data.

Table 5 shows that the establish model has a suitable fit to the model data because the threshold of CMIN/df is less than 2 (1.899) and GFI value is 0.912 and AGFI is almost 0.90 (Tabachnick, Fidell, & Ullman, 2007). CFI and NFI values almost 1 surpass the accepted level of 0.90 (Hu & Bentler, 1999). The "Root Mean Square Error of Approximation" (RMSEA) is 0.054 that is less than the threshold value of 0.08 (Hair, Black, Babi, & Anderson, 2010; Byrne, 2013).

Table 6: Regression weights

| Paths | | | Estimate | S.E. | C.R. | P value |
|---|---|---|---|---|---|---|
| MNG | <--- | NAC | 0.567 | 0.069 | 8.215 | *** |
| OIG | <--- | ACA | 0.145 | 0.071 | 2.056 | 0.04 |
| OIG | <--- | NAC | 0.180 | 0.085 | 2.105 | 0.03 |
| OIG | <--- | MNG | 0.407 | 0.071 | 5.720 | *** |
| ACA4 | <--- | ACA | 1 | | | |
| ACA3 | <--- | ACA | 1.051 | 0.082 | 12.858 | *** |
| ACA2 | <--- | ACA | 1.015 | 0.079 | 12.852 | *** |
| ACA1 | <--- | ACA | 1.058 | 0.086 | 12.316 | *** |
| NAC4 | <--- | NAC | 1 | | | |
| NAC3 | <--- | NAC | 1.165 | 0.071 | 16.495 | *** |
| NAC2 | <--- | NAC | 1.137 | 0.073 | 15.644 | *** |
| NAC1 | <--- | NAC | 0.961 | 0.068 | 14.049 | *** |
| MNG1 | <--- | MNG | 1 | | | |
| MNG2 | <--- | MNG | 1.07 | 0.068 | 15.69 | *** |
| MNG3 | <--- | MNG | 0.886 | 0.062 | 14.207 | *** |
| MNG4 | <--- | MNG | 1.081 | 0.068 | 15.87 | *** |
| MNG5 | <--- | MNG | 0.938 | 0.067 | 14.05 | *** |
| MNG6 | <--- | MNG | 0.972 | 0.071 | 13.623 | *** |
| OIG1 | <--- | OIG | 1 | | | |
| OIG2 | <--- | OIG | 0.961 | 0.055 | 17.444 | *** |
| OIG3 | <--- | OIG | 0.896 | 0.07 | 12.788 | *** |
| OIG4 | <--- | OIG | 1.104 | 0.08 | 13.741 | *** |
| OIG5 | <--- | OIG | 0.979 | 0.073 | 13.393 | *** |
| OIG6 | <--- | OIG | 1.037 | 0.078 | 13.289 | *** |

Source: Calculated from survey data. *** = P<0.01

The regression results of the unstandardized MLE are presented in Table 6. Critical ratios (C.R.) is the proportion of estimate and standard error and the significant value is presented under the P column. The estimated coefficients will be significant if $P < 0.05$ and the C.R. >1.96. The C.R. values remain high as 8.215, 5.720, 2.105 3.402, and 2.056. Each path (see Figure 4) measures the correlation coefficient between the constructs. Such values direct the change amount in university image (OIG) and management image (MNG) given a standard deviation of one unit change in the predicting variables (ACA and NAC) applied in the model. Based on the regression result in Table 6, all of the constructs displaying positive and statistically influence on the overall university image (OIG). Thus, the regression results supported all hypotheses H1, H2, H3, and H4.

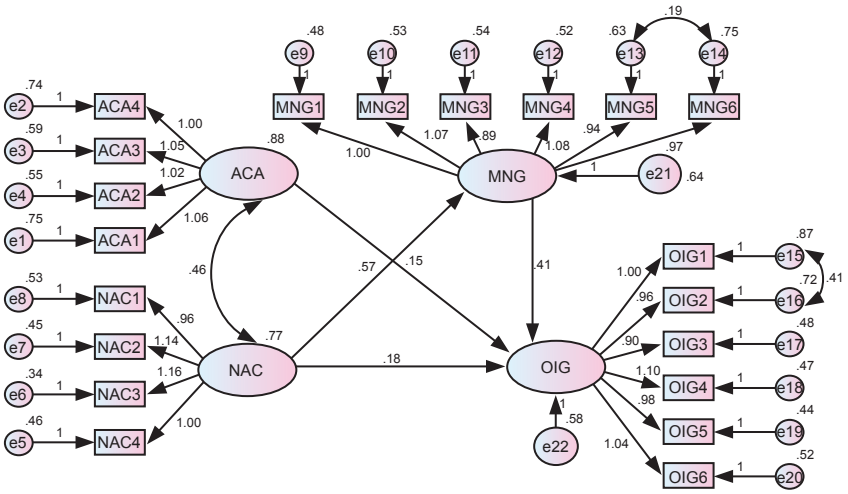


Figure 4: SEM Model of measuring university image; Source: Compiled by survey data.

## 5. Discussion

This research focuses on 20 items under four main factors recognized as the impact of overall university image, and profitably confirmation that all have a statistically significant effect. Existing literature supported that affective feature of university image contained only four factors included only 17 items out of the original 49 items (Alwi & Kitchen, 2014). To predict the university image, four dimensions were also used by Kazoleas, Kim, and Moffitt (2001), Palacio, Meneses, and Perez (2002), and Arpan, Raney, & Zivnuska (2003). The strength of the study is that when comparing previous studies to the overall university image, it was found that they focused only on the perceptions of current university students (Zaghloul, Hayajneh, & AlMarzouki, 2010; Duarte, Alves, & Raposo, 2010; Aghaz, Hashemi, & Atashgah, 2015; Alcaide-Pulido, Alves, & Gutierrez-Villar, 2017), but the study collected data from current and alumni students of IIUC. Besides, the study observed that all the fit indices in the measurement model (Table 2) lie within reasonable limits, which indicates that the overall fit is well. The result of confirmatory factor analysis showed that standardized factor loadings consider in this study are larger than the limiting value of 0.50 and CR values are larger than 0.70. Table 3 illustrates that the first factor contains four items all with loadings of at least 0.738 including the items of program quality (0.768), teaching quality (0.790), research facility (0.790), and career facility (0.738). These four items were designed to measure the academic image. The second factor is also involved four items all with loadings of at least 0.758

including the items of administrative and support services (0.758), library & seminar facilities (0.832), medical facilities (0.875), and internet facilities (0.790). These four sub-factors were considered to measure the impact of the non-academic image. The third-factor management image entailed six items with loadings of at least 0.73 including the items of campus security and environment (0.850), accommodation facility (0.810), affordable tuition fees (0.751), transport facility (0.819), canteen facility (0.740), and sports facility (0.730). Finally, the overall university image consists of six items with loadings of at least 0.72. The sub-factors included global reputation of the university (0.720), alumni (0.739), students' satisfaction (0.781), employees' satisfaction (0.838), social acknowledgment (0.815), and distance from the city (0.808).

Model's validity in next step is illustrated in Table 3 by assessing descriptive statistics, AVE, reliability, and discriminant validity of each construct. The mean and standard deviation of the constructs ranged between the highest for management image (3.258±0.992) and lowest for academic image (2.949±1.049). Cronbach's α if item deleted ranged between 0.920 and 0.922 with the total alpha (α) score for the scale (0.92). The value of AVE is larger than 0.50 (ACA = 0.596, NAC = 0.664, MNG = 0.619, OIG = 0.608). The results of the AVE were found satisfactory according to Fornell and Larcker (1981) criteria. The diagonal value in Table 4 shows satisfactory discriminant validity. Thus, the results of the study provide high internal consistency of the scale as well as the significance of the items scale conformation.

After the factor construction assessment, SEM is depicted to test the hypotheses by measuring structural path coefficients. The results in Table 6 showed that all structural paths are found as significant at different levels. The structural path model in figure 4 indicates that management image has a direct significant positive influence on overall university image. Therefore, H4 is justified ($\beta = 0.407$, $p < 0.01$). The non-academic image has a both direct and indirect significant influence on overall university image in IIUC at 5% level. Hence, H3 is supported ($\beta = 0.180$, $p < 0.05$). Meydan and Sesen (2011) state that direct and indirect relationships among the causal variables are the most significant part of the SEM. The model shows that non-academic image has a direct significant positive influence on the management image. Hence, H2 is justified ($\beta = 0.567$, $p < 0.01$). Finally, the academic image has also a direct significant positive influence on the overall university image and it is also significant at 5% level. Hence, H1 is verified ($\beta = 0.145$, $p < 0.05$). All the four hypotheses consider in this study have been found significant. The value of the explanatory power of the model is 61%. Thus, the established model explains the overall university image well.

**6. Conclusion and recommendations**

The purposes of this research were to analyze the factors affecting overall university image by designing a conceptual model on the basis of literature review as well as the case university. This research offers a quantitative technique that covers a descriptive study design. Analysis of this research intensifies that which factor contribute to the overall university image. The results show that all the four constructs considered in this study are statistically significant. The study broadcast the most significant constructs of examining overall university image are non-academic and management image. The highly significant construct non-academic image related to administrative and support services, library & seminar facilities, medical facilities, and internet facilities. Thus, to expand the image of IIUC as a whole, the administrative and support services, library and seminar facilities, medical facilities, and internet facilities of IIUC should be increased. The next important significant factor in our study is management image. Based on the findings from the management image, university authorities must take into consideration the development of campus security and environment, accommodation facility, affordable tuition fees, transport facility, canteen facility, and sports facility. According to the findings, the academic image has played an important role in determining overall university image but surprisingly it has a less significant ($P < 0.05$) effect on overall university image. The academic image was developed by program quality, teaching quality, research facility, and career facility. The study found that non-academic image has both direct and indirect significant positive influence on the management image. Therefore, fruitful measures should be implemented to improve the non-academic and management image. The developed model explains 61% of the total variation of the overall university image. Thus, the development model performs well in the overall university image.

Findings of the study recommend some valuable strategic information for the university management about the factors that affect the overall university image. The findings of this research can be beneficial for IIUC management and stakeholders along with all other HEIs and PHEIs in Bangladesh when these institutions search for classifying the overall image of the university. It can also provide experimental support to IIUC management for monitoring the overall university image. In addition, this study may contribute to attracting new students as well as university marketing policies. Thus, based on the findings of the study, if the institution is interested in enhancing their overall image, they should focus mainly on non-academic and management image. Besides this, achieving more reputation globally, the

academic facility also needs to be developed and up to date. The result of this research also asserts on the university personnel's more and proper attention is supported by positive and better reputation towards overall university image development. Last but not least outcomes of this research also extend the existing literature on the overall university image sources in HEIs sectors in Bangladesh. Proper implementation of the above recommendations will ensure the global image of IIUC as well as others HEIs in Bangladesh.

**7. Limitations**

The main limitation of this research is respondents covering only one private higher education institutions in Bangladesh when the contentions should be validated more by further research. It is essential to justify that if we collect the sample from other universities the development model may not perform consistently. Even the model may differ due to the generation and type of PHEIs in Bangladesh. Another drawback is that this study is based on perceptions of current and alumni students as the main partners of the university. However, it is true that in any organization different stakeholders may have different views (Carmeli, Gilat, & Weisberg, 2006). Thus, in future research studies, most of the HEIs and PHEIs in Bangladesh can be brought under research for university image evaluation for getting a comprehensive outcome.

**References**

Aghaz, A., Hashemi, A., & Sharifi Atashgah, M. S. (2015). Factors contributing to university image: The postgraduate students' points of view. *Journal of Marketing for Higher Education, 25*(1), 104-126. doi: 10.1080/08841241.2015.1031314

Alcaide-Pulido, P., Alves, H., & Gutierrez-Villar, B. (2017). Development of a model to analyze HEI image: A case based on a private and a public university. *Journal of Marketing for Higher Education, 27*(2), 162–187. doi:10.1080/08841241.2017.1388330

Ali-Choudhury, R., Bennett, R., & Savani, S. (2009). University marketing directors' views on the components of a university brand. *International Review on Public and Nonprofit Marketing, 6*(1), 11-33. doi:10.1007/s12208-008-0021-6

Alam, M. M., Billah, M. A., & Alam, M. S. (2014). Factors affecting academic performance of undergraduate students at International Islamic University Chittagong (IIUC), Bangladesh. *Journal of Education and Practice, 5*(39), 143-154.

Alam, M. M. D., & Noor, N. A. M. (2020). The relationship between service quality, corporate image, and customer loyalty of Generation Y: An application of SOR paradigm in the context of superstores in Bangladesh. SAGE Open, 10(2), 1-19.doi: 10.1177/2158244020924405

Alessandri, S. (2001). Modeling corporate identity: A concept explication and theoretical explanation. *Corporate Communications: An International Journal, 6*(4), 173-182. doi: 10.1108/EUM0000000006146

Alwi, S. F. S., & Kitchen, P. J. (2014). Projecting corporate brand image and behavioral response in business schools: Cognitive or affective brand attributes? *Journal of Business Research, 67*(11), 2324-2336. doi: 10.1016/J.JBUSRES.2014.06.020

Arpan, M. L., Raney, A.A., & Zivnuska, S. (2003). A cognitive approach to understanding university image. *Corporate Communications: An International Journal, 8(*2), 97-113. doi: 10.1108/1356328031047535

Bakanauskas, A., & Sontaite, M. (2011). Measurement model of corporate reputation at higher education institutions: Customers' perspective. *Management of Organizations: Systematic Research, 59,* 115–130.

Berry, K., & Cassidy, S. (2013). Emotional labour in university lecturers: considerations for higher education institutions. *Journal of Curriculum and Teaching, 2*(2), 22-36. Doi: 10.5430/jct.v2n2p22

Belanger C., Mount J., & Wilson M. (2002). Institutional image and retention. *Tertiary Education & Management 8*(3), 217–30. doi: 10.1080/13583883.2002.9967080

Byrne, B. M. (2013). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. Abingdon: Routledge.

Carmeli, A., Gilat, G., & Weisberg, J. (2006). Perceived External Prestige, Organizational Identification and Affective Commitment: A Stakeholder Approach. *Corp Reputation Rev, 9*(2), 92–104. doi: 10.1057/palgrave.crr.1550014

Castillo Díaz, A., Carrillo Durán, M. V., & Tato Jiménez, J. L. (2013). Spanish universities online branding. Functional and emotional values online analysis in their corporative websites. *Studies on the Journalistic Message, 19,* 85-97. https://doi.org/10.5209/rev_ESMP.2013.v19.42014

Curtis, T., Abratt, R., & Minor, W. (2009). Corporate brand management in higher education: The case of ERAU. *Journal of Product & Brand Management, 18*(6). doi: 10.1108/10610420910989721

Chapleo, C. (2015). An exploration of branding approaches in UK universities. *International Journal of Nonprofit and Voluntary Sector Marketing, 20*(1), 1-11.

Duarte, P. O., Alves, H. B., & Raposo, M. B. (2010). Understanding university image: a structural equation model approach. *International Review on Public and Nonprofit Marketing, 7*(1), 21-36. doi:10.1007/s12208-009-0042-9

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39-50. doi: 10.1177/002224378101800104

Fernández, C. G., & Trestini, K. M. O. (2012). Factors of the university institutional image: perspective from a sector of the internal public, administrative personnel. *Industrial Engineering Magazine, 11*(2).

Gafoor, K. A., & Ashraf, P. M. (2012). Influence of school-image on academic self-efficacy belief. *Innovations and Researches in Education 2*(1), 51-58.

Gregory, J. R., & Wiechmann, J. G. (1999). *Marketing corporate image: Your company as your number one product.* Lincolnwood, IL: NTC Business Books.

Gray, B., Fam K., & Llanes V. (2003). Branding universities in Asian markets. *J Prod Brand Manag 12*(2), 108–118. doi: 10.1108/10610420310469797

Guilbault, M. (2016). Students as customers in higher education: reframing the debate. *Journal of Marketing for Higher Education, 26*(2), 132-142.doi: 10.1080/08841241.2016.1245234

Gutman, J., & Miaoulis, G. (2003). Communicating a quality position in service delivery: an application in higher education. *Managing Service Quality: An International Journal, 13*(2), 105-111. doi: 10.1108/09604520310466798

Hafez, M. (2018). Measuring the impact of corporate social responsibility practices on brand equity in the banking industry in Bangladesh. *International Journal of Bank Marketing, 36*(5), 806-822. doi: 10.1108/IJBM-04-2017-0072

Hair Jr., J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective* (7th Ed.). Upper Saddle River, NJ: Pearson Education.

Hemsley Brown, J., & Oplatka, I. (2006). Universities in a competitive global marketplace: A systematic review of the literature on higher education marketing. *International Journal of public sector management, 19*(4), 316–338. doi: 10.1108/09513550610669176

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural equation modeling: *A multidisciplinary journal, 6*(1), 1-55. doi: 10.1080/10705519909540118

International Islamic University Chittagong [IIUC]. (2021, May 5). In *Wikipedia*. Retrieved from https://en.wikipedia.org/wiki/International_Islamic_University,_Chittagong

International Islamic University Chittagong [IIUC] (2020): Retrieved from https://www.iiuc.ac.bd/about/history# (accessed: the 2nd February, 2020).

Ivy, J. (2001). Higher education institution image: A correspondence analysis approach. *International Journal of Educational Management, 15*(6), 276–282. doi:10.1108/09513540110401484

Jenkins N. (1991). *The business of image: Visualizing the corp. message*. Kogan Page Limited

Kazoleas, D., Kim, Y., & Moffitt, M. A. (2001). Institutional image: A case study. *Corporate Communications: An International Journal, 6*(4), 205–216. doi:10.1108/EUM0000000006148

Khan, M. A., & Ali, A. J. (2012). Factors affecting customers' intention towards online shopping in Bangladesh. *Indonesian Management and Accounting Research, 11*(1), 21-36.

Khan, M. A., Ali, A. J., & Arefeen, S. (2014). The impact of training on NGO beneficiaries' education in Bangladesh: The missing link. *Advances in Environmental Biology, 8*(9), 679-688.

Khan, M. A., Islam, M. A., & Ali, A. J. (2014). Educational development of NGO beneficiaries in Bangladesh: a disjunction between programmes and implementation. *Asian Social Science, 10*(22), 57-69.

Khan, M. A., Toy, M. M., & Siddique, A. (2010). Stimulating factors and justification of the strategic approach applicable for the internationalisation of SMEs in Bangladesh. *Indonesian Management and Accounting Research, 9*(2), 1-14.

Khanna, M., Jacob, I., & Yadav, N. (2014). Identifying and analyzing touch points for building a higher education brand. *Journal of Marketing for Higher Education, 24*(1) 122-143. doi: 10.1080/08841241.2014.920460

Kline, R. B. (2011). *Principles and practice of structured equation modeling*. New York, USA: Guilford Press.

Luque-Martínez, T., & Del Barrio-García, S. (2009). Modelling university image: The teaching staff viewpoint. *Public Relations Revien, 35*(3), 325-327. doi: 10.1016/j.pubrev.2009.03.004

Mackelo, O., & Drūteikienė, G. (2010). The Image of a higher education institution, its structure and hierarchical level: the case of the Vilnius university faculty of economics. *Ekonomika, 89*(3), 105-121. doi: 10.15388/Ekon.2010.0.972.

Mainardes, E. W., Alves, H., & Raposo, M. (2012). A model for stakeholder classification and stakeholder relationships. *Management Decision, 50*(10), 1861-1879. doi: 10.1108/00251741211279648

Mallika Appuhamilage, K. S., & Torii, H. (2019). The impact of loyalty on the student satisfaction in higher education: A structural equation modeling analysis. *Higher Education Evaluation and Development, 13*(2). 82-96. doi: 10.1108/HEED-01-2019-0003

Martínez Pérez, F. J., Blasco Sánchez, M. D. C., & Moreno Bernabé, M. (2015). University campuses and accommodation: A commitment of urban nature CYAN. *Journal of the History of Universities, 18*(2), 203-232.

Meydan, C. H., & Sesen, H. (2011). *Structural equation modeling AMOS applications*. Ankara: Detay Publishing.

Nunnally, J. C. (1994). *Psychometric Theory* (3rd ed.). New Delhi: Tata McGraw-Hill.

Nguyen, N., & LeBlanc, G. (2001). Image and reputation of higher education institutions in students' retention decisions. *International Journal of Educational Management, 15*(6), 303-311. doi: 10.1108/EUM0000000005909

Palacio, A. B., Meneses, G. D., & Perez, P. J., (2002). The configuration of the university image and its relationship with the satisfaction of students. *Journal of Educational Administration, 40*(5), 486-505. doi: 10.1108/09578230210440311

Polat, S. (2011). The relationship between university students' academic achievement and perceived organizational image. *Educational Sciences: Theory and Practice, 11*(1), 257-262.

Rahman, M. S. (2012). Service quality, corporate image and customer's satisfaction towards customer's perception: An exploratory study on telecom customers in Bangladesh. *Business Intelligence Journal, 5*(1), 56-63.

Rahman, S. M. M., Mia, M. S., Ahmed, F., Thongrak, S., & Kiatpathomchai, S. (2020). Assessing students' satisfaction in public universities in Bangladesh: An empirical study. *Journal of Asian Finance, Economics and Business, 7*(8), 323-332. doi: 10.13106/jafeb.2020.vol7.no8.323

Reid, W. A. (1973). Applicants' images of universities. *Educational Review, 26*(1), 16-29. doi: 10.1080/0013191730260102

Soutar G., & Turner J. (2002). Students' preferences for university: A conjoint analysis. *International Journal of Educational Management, 16*(1), 40-45. doi: 10.1108/09513540210415523

Sung, M., & Yang, S. U. (2008). Toward the model of university image: The influence of brand personality, external prestige, and reputation. *Journal of Public Relations Research, 20*(4), 357-376.

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol.5, pp. 481-498). Boston, MA: Pearson.

Theus, K. T. (1993). Academic reputations: The process of formation and decay. *Public Relations Review, 19*(3), 277-291.

Treadwell, D. F., & Harrison, T. M. (1994). Conceptualizing and assessing organizational image: Model images, commitment, and communication. *Communications Monographs, 61*(1), 63-85. doi:10.1080/03637759409376323

Uddin, M. M., & Khan, M. A. (2017). Role of leadership on organizational learning at private universities of Bangladesh. *IIUC Studies, 14*(2), 9-34.

Uddin, M. S., Khan, M. A., & Solaiman, M. (2014). Human resource development through training on business teachers in Bangladesh. *International Journal of Business and Technopreneurship, 4*(1), 83-96.

Uddin, M. S., Khan, M. A., Uddin, M. K., & Solaiman, M. (2015). University-Industry Collaboration (UIC) for developing highly skilled and productive business graduates in Bangladesh. *International Journal of Management and Business Research, 5*(1), 31-41.

Uddin, M., Ali, K., & Khan, M. A. (2018). Impact of service quality (SQ) on student satisfaction: empirical evidence in the higher education context of emerging economy. *AL-'ABQARI: Journal of Islamic Social Sciences and Humanities, 16,* 31-67.

University Grants Commission of Bangladesh [UGC]. (2020). Retrieved from http://www.ugc.gov.bd/ (accessed: the 2nd February, 2020).

Vidaver-Cohen, D. (2007). Reputation beyond the rankings: A conceptual framework for business school research. *Corporate Reputation Review, 10*(4), 278-304. doi: 10.1057/palgrave.crr.1550055

Wilkins, S., & Huisman, J. (2015). Factors affecting university image formation among prospective higher education students: The case of international branch campuses. *Studies in Higher Education, 40*(7), 1256-1272. doi: 10.1080/03075079.2014.881347

Weissman, J. (1990). Institutional image assessment and modification in colleges and universities. *Journal for Higher Education Management, 6*(1), 65-75.

Zaghloul, A. A., Hayajneh, Y. A., & AlMarzouki, A. (2010). Factor analysis for an institutional image instrument. *International Review on Public and Nonprofit Marketing, 7*(2), 157-166. doi:10.1007/s12208-010-0056-3

**Corresponding author**
Mohammad Manjur Alam can be contacted at: manjuralam44@yahoo.com