

Acquiring Quality Accreditation for Higher Education in Egypt

An Empirical Investigation Using Structural Equation Modeling

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Abstract

Despite it is commonly recognized that accreditation helps to promote quality improvement of higher education over time and enhance universities' ability to be credible and competitive as well as provides constructive criticism from outside perspective, gaps remain due to the limited studies that empirically investigated this phenomenon in developing countries context.

In responding to this call, the current study aimed at helping to narrow the existing research gap in the literature and contribute to the accumulated knowledge through achieving the following interrelated objectives. Provide further insights into accreditation as a higher education quality indicator. Integrate and examine simultaneously the critical motivating factors that positively impact universities in Egypt as an example of developing country, to acquire accreditation as well as providing empirical evidence about which ones found significant. Developing and validating a structural equation model (SEM) for predicting the behavioral intention to obtain accreditation.

A multi-stage research methodology was utilized, combining quantitative and qualitative methods to validate the research model and empirically test the hypothesized relationships. The developed questionnaire was pretested and feedback from the pre-test and the panel of experts used to revise the survey instrument. The hypothesized relationships have been tested using structural equation modeling (SEM). The evidence of a good fit, reliability and validity indicated that the measurement model deemed appropriate for testing the structural model that demonstrated highly explanatory power.

Keywords: Accreditation, Higher Education, Quality improvement, Structural Equation Modeling (SEM), Universities

Introduction

The last decade has witnessed a growing interest in educational quality and rapid increase in the number of higher-education institutions (universities) seeking quality accreditation for their different degree programs, which become one of the most controversial issues and a focal-point in both higher education and literature [e.g. 1, 2, 3].

In Europe, international accreditations of degree programs are now gaining popularity not in all higher education areas [4]. Several studies address this phenomenon from different perspectives and dimensions, such as international accreditation standards criteria, indicators development for accreditation, accreditation perceptions among faculty students, administrators and deans, the impact of regulation on university accreditation, and the impact of accreditation on universities [3, 4, 5, 6]. While subsequent research such focused on the perceptions of faculties' deans about accreditation standards and the impact of those changes in these standards may have on their faculties, which become more accountable to external stakeholders [5]. It is worth noting that accreditation standards have been modified to better fit an emerging global education market perspective, and to adopt learning goals and measure the direct progress of the learning associated with such goals [5,7, 8, 9, 10, 11, 12, 13, 14, 15].

While these approaches are theoretically grounded in related literature, little research put strong emphasis on exploring or identifying factors influencing universities to adopt accreditation in education and the impact of accreditation on their ability to compete [7, 16]. Therefore, there would seem to be some merit for more studies to examine empirically factors that motivating higher-education institutions to acquire accreditation for their different degree programs. The current research is an attempt at this direction

Research Problem, Objectives and Plan

Despite it is commonly recognized that accreditation helps to improve education quality and promote continuous improvement over time, as well as enhancing universities' ability to gain credibility and competitive and provides constructive criticism from outside perspective, little research examined this claim empirically and few have addressed factors influencing the adoption of accreditation which have often not been well-theorized [3]. Furthermore, accreditation research to date has mainly focused around programs and practices associated with primary and secondary education with limited research at higher education level [17].

Additionally, gapes remain due to the limited studies that empirically investigated this phenomenon in Arab countries context. In responding to this call, the current study aimed at helping to narrow the existing research gap in the literature and contribute to the accumulated knowledge through achieving the following interrelated objectives. (a) provide further insights into accreditation as a higher education quality indicator (b) integrate and examine simultaneously the critical motivating factors that positively impact universities to acquire accreditation as well as providing empirical evidence about which ones found significant (c) developing and validating a structural equation model (SEM) for predicting the behavioral intention to obtain accreditation.

With these objectives in view, the current research has been organized as follows: the literature and relevant studies were reviewed and analyzed. Then a research model was proposed and hypotheses were developed to be tested in the study. This was followed by an explanation of the procedures used to obtain empirical data, measurement, and validation processes, as well as the testing of the hypotheses stated. Finally, based on paper's findings a series of conclusions with practical and academic implications and final thoughts that emphasize the great interest in the topic under analysis were presented, and then certain limitations and future lines of research with regard to this issue were highlighted.

Literature review and Developing Hypotheses

Relevant literature, which provided the conceptual foundation and theoretical background for this paper, and past research were extensively reviewed in order to develop more effectively the study hypotheses and the proposed model. Through this process, it was noted that although the stated primary purpose of accreditation is to improve education quality or promote continuous improvement, many higher education institutions strive to obtain accreditation for several reasons [3,18].

Likewise, others [19] reported that accreditation is a creditable and effective way to provide a measure of the quality of higher education institutions provides legitimization and offers students and other stakeholders' external validation that higher education institution is managerially relevant and conforming to a sound and globally accepted curriculum. According to [20] accreditation has a positive impact on faculty salaries and productivity of higher-education institutions. Other research [e.g.18] concluded that higher education institutions (business faculties in the study) are motivated to adopt accreditation to improve student learning.

In contrary, [21] measured perceptions of organizational effectiveness in higher-education institutions and found that accreditation contributed toward effectiveness measures such resource acquisition, but not necessarily student outcomes. On the other hand, [5] found that accreditation is a basic requirement to be a credible and facing other competitive higher education institutions, they considered obtaining accreditation as an indicator of a quality education and approach to enhancing ability to be effective in faculty recruitment and student placement, and coping competition from other institutions. In this context, others [22] emphasized that higher-education quality perceived as stakeholders' requirement. According to [23] the increased competition among higher education institutions affects quality and accessibility of higher education, as well as economic behavior of universities on the market.

Drawing upon the comprehensive review of the specialized literature, which demonstrated the most factors that had been utilized by previous studies, and taking into account the theoretical background discussed earlier, as well as the data collected from qualitative study in the preliminary stage of our current study, the following hypotheses that guide the investigation were developed for testing their relationships

H₁: Competition pressure influences higher-education institutions to acquire accreditation for their degree programs.

H₂: Stakeholders pressure positively influences higher-education institutions to acquire accreditation for their degree programs.

H₃: Increasing the ability to recruit qualified faculty staff positively influences higher-education institutions to acquire accreditation for their degree programs.

H₄: Increasing the ability for students' replacement positively influences higher-education institutions to acquire accreditation for their degree programs.

H₅: Ability to meet standards positively influences higher-education institutions to acquire accreditation for their degree programs.

H₆: Perceived credibility positively influences higher-education institutions to acquire accreditation for their degree programs.

H₇: Perceived organizational effectiveness positively influences higher-education institutions to acquire accreditation for their degree programs.

Constructing the Structural Analytic Model

In this paper, a structural research model was developed through the integration of the constructs mentioned in the previous hypotheses, which incorporated many of the relevant features of accreditation implementations identified in literature to be examined simultaneously in one framework for validation. The strength of the hypothesized relationships embedded in the model and its robustness of predicting the higher-education institutions' intention to acquire accreditation for their degree programs were evaluated. Therefore, our research model contained 8 constructs. seven independent variables (competition pressure, stakeholders pressure, ability to recruit qualified faculty staff, students replacement, ability to meet standards, perceived credibility, and perceived organizational effectiveness) utilized as predictors of the criterion dependent variable intention to acquire accreditation.

Structural equation modeling (SEM) was adopted in our data analysis to provide efficient estimation for separate multiple regression equations estimated simultaneously where constructs could be represented by a summed scale and assess the relative importance of each construct. Thus, the initial prediction multiple regression equation (*EGI*) of the research model can be presented as follows:

$Y_{ACC} = a + b_{CBC} CBC + b_{STP} STP + b_{RQS} RQS + b_{STR} STR + b_{AMS} AMS + b_{PRC} PRC + b_{POE} POE \text{ -----}(EGI)$
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Where:

- CBC = Competition pressure*
- STP = Stakeholders pressure*
- RQS= Ability to recruit qualified faculty staff*
- STR= Ability for students' replacement*
- AMS= Ability to meet standards*
- PCR= Perceived credibility*
- POE= Perceived organizational effectiveness*
- Y_{ACC}= Intention to acquire accreditation*

Overall, the evidence of a good model fit, reliability, and convergent validity indicated that the measurement model was appropriate for testing the structural research model. However, the measurement items used to operationalize these constructs were derived from previous relevant works and the wording of the items was adjusted to match the present context.

Research Methodology

A richer research methodology is used in this empirical study combining quantitative and qualitative methods to validate the research model and empirically test the hypothesized relationships among its variables. Thus, the research process involved multi-stage procedures as follow.

Preliminary Qualitative Study

Preliminary qualitative study data were gathered by methods of focus group, complemented by a series of in-depth face-to-face interviews with five deans and five senior executive managers of the quality assurance units of Egyptian universities to gain deeper understanding of the phenomenon under consideration, supports hypotheses development and establishes the criteria and relationship constructs relevant to our empirical study. Issues arising from this stage were used as a basis for the subsequent quantitative study.

Quantitative Research Design

Furthermore, a quantitative research study in the form of questionnaires was conducted in two stages, first the pilot survey was administrated during December 2015 to test the questionnaire's reliability, and second a cross-sectional national sample survey for data collection was conducted during January to March 2016. The target population was full-time staff, administration staff, deans, vice deans and executive managers, and members of quality assurance units in Egyptian public and private universities, using simple random sampling technique to gain as many representative samples as possible and increase generalizations of the results.

The list of Egyptian Public and Private Universities at the Egyptian Supreme Council of Universities' website (<http://www.scu.eun.eg/wps/portal>) served as a sampling frame for this study. Among a total of 800 questionnaires that were randomly distributed, 432 valid responses were obtained and used in data analysis, after removing invalid answers, yielding a usable response rate of 54.00 percent for the overall survey. The respondents did not need assistance in completing the questionnaires as the information on the cover letter and instructions on how to fill the questionnaire were explicit.

Instrument, Validity and Reliability

Before the full-scale survey, the present study took steps to ensure reliability and validity. The scales used for measurement process were adapted from well-established survey items of previous works and modified to suit the purpose of the current study. Research variables were measured by multiple items, using a 7-point scale ranging from (1) strongly disagree to (7) strongly agree. All items included in the questionnaire were cross-validated before they were added.

The questionnaire was pre-tested and then followed by a pilot test to validate the instrument. In the pre-test, the respondents were asked to comment on listed items regarding the research constructs, including instrument length, questions format, the wording of scales, and other comments on how the questionnaire could be improved. The pilot test aimed to ensure that questionnaire adequately addressed the relevant issues and reducing possible ambiguity in the questions. Based on pre-test and pilot test feedback, modifications had been made to improve readability and appropriateness. The revised questionnaire was again pre-tested and the final version was found worked well and the instrument has confirmed content validity.

The Cronbach's alpha coefficient test was used to evaluate the internal consistency reliability. The reliability analysis results exhibited an acceptable level, the value of Cronbach's alpha coefficient of every construct is greater than 0.8 (ranging from 0.81 to 0.94). Also, exploratory factor analysis was used to evaluate the construct validity and the results demonstrate acceptable standard.

Data Analysis, Model Testing and Results

The empirical data collected by the survey was analyzed and tested using statistical software packages (SPSS). The analysis included descriptive statistics, correlation to examine the relationships among variables, multiple regression analyses with its associated statistical inference tests were applied due to the presence of many predictors in the study, to test for the joint and independent influence of predictors on the criterion variable. Stepwise forward inclusion techniques of regression analysis were performed to assess the relative importance of predictor variables mentioned earlier and to select a smaller subset of variables that account for most of the variation in the criterion variable. To determine whether any multicollinearity effects among the independent variables included in the model equations, the total correlation matrix was reviewed in-depth and the results revealed that there was no severe multicollinearity problem among the regressors, which suggested that predictors were tolerated in the criterion variable. The results of testing each of the hypotheses are given below.

The summary output of the stepwise regression analysis (forward inclusion) introduced in Table 1 led to accept the hypotheses (H_1 to H_3 and H_5 to H_7) while the statistical significance test supported this acceptance and confirmed the hypothesized relationships. A strong significant and meaningful correlation is found, in the final model "model 6", between criterion variable Y_{ACC} and the above mentioned predictor variables (*Multiple R "model 6"* = 0.898). The value of F- ratio "model 6" ($F(6,425) = 295.882$ at $p < 0.000000000$) is statistically significant indicating that the results of the model could hardly have occurred by chance. Thus, the goodness-of-fit of the model considered satisfactory.

Table I:

Summary output of the stepwise regression analyses (forward inclusion)

Model	R	R ²	Adj. R ²	SS _{reg}	SS _{res}	SS _{total}	df	f	Sig.
1	0.872 ^a	0.761	0.760	812.322	255.342	1067.664	1, 430	1367.963	0.0000000*
2	0.881 ^b	0.777	0.776	829.488	238.177	1067.664	2, 429	747.030	0.0000000*
3	0.891 ^c	0.793	0.792	846.881	220.784	1067.664	3, 428	547.240	0.0000000*
4	0.893 ^d	0.798	0.796	852.015	215.649	1067.664	4, 427	421.761	0.0000000*
5	0.897 ^e	0.805	0.802	859.051	208.613	1067.664	5, 426	350.846	0.0000000*
6	0.898 ^f	0.807	0.804	861.438	206.226	1067.664	6, 425	295.882	0.0000000*

a. Model1: Predictors Variables entered: (constant), CBC
b. Model2: Predictors Variables entered: (constant), CBC, PCR
c. Model3: Predictors Variables entered: (constant), CBC, PCR, STP
d. Model4: Predictors Variables entered: (constant), CBC, PCR, STP, AMS
e. Model5: Predictors Variables entered: (constant), CBC, PCR, STP, AMS, RQS
f. Model6: Predictors Variables entered: (constant), CBC, PCR, STP, AMS, RQS, POE
Criterion Variable: Y_{ACC}

The coefficient of determination, multiple R-square suggested that the proposed final model is valid, the predictor variables of the model explained the major proportion (80.70 %) of the variability observed among the criterion variable Y_{ACC} (R^2 "model 6" = 0.807), which reinforce our confidence in the hypotheses testing results and provides support for the above mentioned association. Furthermore, the adjusted R^2 of the model 6, which is a more conservative estimate of variance by considering error variance, is 0.804. This reinforces our confidence that the overall explanatory power of the research model considered high and quite capable of explaining the observed variance among the sample.

As seen from table I, it is worth mentioning that among 7 predictor variables included in the initial equation (EG1), 6 variables (CBC, PCR, STP, AMS, RQS and POE) were found to have a critical significant impact on the criterion variable intention to acquire accreditation (Y_{ACC}). They succeeded in entering into the final model "model 6" equation. The stepwise technique determined which of the initial 7 constructs should be included as predictors in the final equation. Nevertheless, tracing the order in which these variables have been entered the equation suggested that the competition pressure specifically considered the most critical motivating factor for adopting accreditation, it has the most significant impact on universities' intention to acquire accreditation for their degree programs. This factor alone explained 76.10 percent of such total variation (R^2 "model 1" = 0.761).

On the other hand, the stepwise analysis (model 6) excluded STR (ability for students' replacement), for its insignificant impact. In other word, this fail denoting that STR has very limited influence on adoption accreditation in the Egyptian context, which could be interpreted in the light of the Egypt culture, as there is still a required awareness towards the impact of students' replacement on the quality accreditation. For easily comparing and assessing the relative impact of each predictor variable on the criterion variable, standardized beta coefficients and t-test values of the 6 variables that succeeded in entering into "model 6" were presented in table II.

Table II:
Standardized and non-standardized coefficients of variables

Predictor ^a	Non-standardized		Standardized Beta		t-test	
	Regression Coefficients		Coefficients			
"Model 6"	Symbol	Value	Symbol	Value	Value	Sig.
CBC	b_{CBC}	0.388	B_{CBC}	0.384	5.152	0.000000*
PCR	b_{PCR}	0.131	B_{PCR}	0.093	3.771	0.000000*
STP	b_{STP}	0.183	B_{STP}	0.145	4.134	0.000000*
AMS	B_{AMS}	0.269	B_{FAS}	0.274	4.188	0.000000*
RQS	b_{RQS}	0.106	B_{RQS}	0.102	2.712	0.01000**
POE	b_{POE}	0.084	B_{POE}	0.155	2.718	0.01000**
Intercept	a	-0.662				

* $p < 0.0000000$ levels of significant
** $p < 0.0100000$ levels of significant

The finding shown in table II is consistent with the results summarized in table I, competition pressure had the highest effect on intention to acquire accreditation with positive association (highest Beta value: Beta CBC = 0.384, and highest t-test value: $t = 5.152$, $p < 0.000000$), followed by the ability to meet standards (Beta AMS = 0.274, $t = 4.188$, $p < 0.000000$). The values of the non-standardized regression coefficients in table II were utilized for mathematically predicting the intention to acquire accreditation by the following final research equation (EQ2), while table III provide a brief summary of hypotheses testing and their structural paths.

$$Y_{ACC} = -0.662 + 0.388 CBC + 0.131 PRC + 0.183 STP + + 0.269 AMS + 0.106 RQS + 0.084 POE \text{ -----(EG2)}$$

Table III:
Summary of Hypotheses Testing

Hypotheses	Structural Paths	Standardized Beta Coefficients	Results
H ₁	CBC -----> Y _{ACC}	0.384*	Supported
H ₂	STP -----> Y _{ACC}	0.145*	Supported
H ₃	RQS -----> Y _{ACC}	0.102**	Supported
H ₄	STR -----> Y _{ACC}	Excluded	Not supported
H ₅	AMS-----> Y _{ACC}	0.274*	Supported
H ₆	PCR-----> Y _{ACC}	0.093*	Supported
H ₇	POE ----->Y _{ACC}	0.155**	Supported

* $p < 0.0000000$ levels of significant

** $p < 0.01000000$ levels of significant

The results of descriptive analysis in table IV indicated that there is moderately adoption regarding quality accreditation in Egyptian universities (*Mean: $X \sim = 3.694444444444444$ out of 7, Standard Deviation: $S \sim = 1.5679997948135$, and Skewness= 0.202970158774476*). This response revealed that not all levels of respondents valued the significant of accreditation equally. Faculties deans, vice deans and administrators were of the opinion that accreditation has had an important impact on education process quality, while others (specifically teaching staff) viewed it as a time-consuming process and administrative burdens.

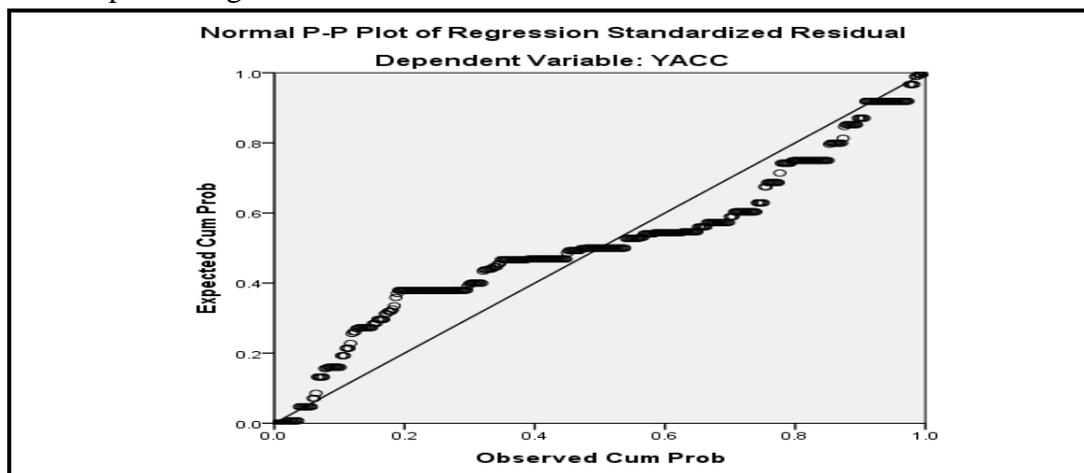
Table IV:
Descriptive Analysis

Mean * $X \sim$	Standard Deviation $S \sim$	Skewness
3.694444444444444	1.5679997948135	0.202970158774476

* Table IV describes the adoption rate of higher-education quality accreditation in Egypt

A P-P plot of regression standardized residual for assessing the assumption of normality was conducted, to see if the error term ϵ is actually normally distributed. The plot, in figure I, showed that the data met the assumptions of normality, quantile pairs fell nearly on a straight line and quite close to the 45-degree line. Thus, it can be concluded that the data used in this research are approximately normally distributed and the fitted model is appropriate.

Figure II:
Normal P-P plot of regression Standardized Residual



* Figure II, shows that the research data met the assumptions of normality

Conclusion, Implications and Recommendations

This paper has taken a further significant step in contributing to both theory and practice of higher education, and to help address some gaps in the current body of literature. More specifically, this study has made a number of important practical (managerial) implementations and theoretical (academic) contributions. In term of *practical implications*, the present research has attempted to enhance current understanding of accreditation adoption in the higher education context with a particular focus on developing countries. The results revealed the importance of adopting accreditation to promote quality improvement of higher-education institutions over time and enhance their ability to be credible and competitive as well as provide constructive criticism from outside perspective.

The current study found that the most critical factor influencing universities in developing countries such as Egypt to acquire accreditation for their degree programs is the competition pressure therefore this aspect especially should be taken in consideration when formulating accreditation strategies. Additionally, the research results provide guidance on how to increase the rate of accreditation adoption, based on the understanding and focusing on the factors influencing this adoption, and their relative importance. As it was found that not all levels of respondents valued the significant of accreditation similarly. Faculties deans, vice deans and administrators were of the opinion that accreditation has had an important impact on education process quality, while others (specifically teaching staff) viewed it as a time-consuming process and administrative burdens. This finding of the present research is partially consistent with other study [4], which provided additional evidence on the validity and relevance of our study's results.

From an *academic and research standpoint*, this study provided empirical evidences and validation for the existing specialized literature concerning higher education and added empirical weight to research addressing developing countries. The findings of the empirical study provide support for the research model and for the hypotheses regarding the directional linkage among its variables. The research model was tested using SEM and results indicated support to the model. The high overall explanatory power of our model indicated that this model is capable of explaining high proportion of the variance observed in the different Egyptian universities. Furthermore, this research sheds the light on the importance of developing a comprehensive model for studying quality accreditation in higher education. As, the study attempted to integrate and encompass the most frequently cited constructs in the literature, and applied them in the local context in order to best examine the phenomenon, which have never been integrated before into one framework subject, to examination for validation and relationship. Therefore, the proposed model contained variables that have not been tested simultaneously in previous works.

Limitations and Further research

As with all empirical study, our research has some limitations that present opportunities for future research. First, the research model was validated using empirical data gathered from Egypt and therefore the findings may be affected by the culture in this developing country. Since the study is cross-sectional in design, a further examination of our argument using a longitudinal study is recommended in the future to investigate our model in different time periods.

Apart from the above, we must point out that although the majority of the hypothesized relationships were validated, and significant, and our structural model yielded a relatively high level value of multiple correlation coefficient, the obtained value of multiple R-square (R^2) infers that other additional variables which may not be considered in our research model can be addressed to enhance ability for prediction. However, there are other opportunities to build on this study in future research. Suggested areas include re-examining the proposed model in other countries with different cultures, and make comparisons, to see whether it can be applied, or whether the same factors turn out equally significant. It would be valuable that future research use other theoretical bases or different methodologies and sample to derive different predictions. Another direction is to analyze the relative advantage of those universities involved in accreditation activities opposed to other universities to see the differences

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