Identyfing the Exogenous Constructs Related to Different Dimensions of Students Satisfaction with Education

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Abstract

The measurement of student satisfaction with education process can be useful to higher education institutions, to help them in identifying their strengths and areas for improvement. To grasp the complexity of learning experience, it is not enough to know the degree to which students are satisfied, it is important to understand the factors that contribute to their satisfaction.

Determining which features of the student experience are closely related to satisfaction may provide information about actions that can be taken to maintain high levels of satisfaction and improve student learning. Therefore, in this research structural equation modeling is used to examine a series of dependence relationship simultaneously in framework of student's satisfaction with education.

Structural equation modeling is multivariate procedure, mostly used for testing both the construct validity and theoretical relationships among a set of multiple variables. After measurement model is validated and hypotheses have been set, it is required to specify structural model. In this research the model is based on undergraduate and graduate students at Faculty of Economics University of Split. The sample of this study consists of 238 undergraduate and graduate students. Exogenous constructs are organization and curriculum, staff, extracurricular activities and financial aspect. Total satisfaction with education process is the only endogenous construct with following elements: courses curriculum, feeling of belonging and acceptance, possibility of practical implementation of learned skills and acquired abilities and teaching process organization.

The objective of this research is to identify educational factors that are associated with students' overall satisfaction with education process. Validity of estimated model will be examined by goodness of fit indicators and evidences of constructs validity.

Introduction

In this paper SEM model is developed in a framework of students' satisfaction analysis. Organization

and Curriculum, as a one of the exogenous construct, is identified by using five indicators or questions on satisfaction within questionnaire. Those indicators are faculty's name and reputation, infrastructure, course contents, accessibility of faculty building and its number of available parking places, and students` academic ability and motivation.

Staff construct consists of following dimensions: faculty staff professionalism, accessibility and expertise and courtesy and professionalism of non-educational staff. Likert scale measurement on satisfaction with those elements represents a Staff construct.

Students' Extracurricular activities certainly represent a component that shape overall satisfaction with higher education. Elements of Extracurricular construct are satisfaction with students` organizations, students` restaurants, internship opportunities and programs of additional education and programs of mobility.

Fourth exogenous construct in our SEM model is Financial aspect, which is represented with following indicators of satisfaction: tuition fees, availability and number of scholarships, additional costs of educational process and students` discounts and subsidies.

Total satisfaction with education process is the only endogenous construct in our SEM model. As its indicators we use, what we believe to be, crucial elements that determine satisfaction of each student with its education. Those elements are following: courses curriculum, feeling of belonging and acceptance, possibility of practical implementation of learned skills and acquired abilities and teaching process organization.

Literature review

Westerman, J.W. et al. (2002) examined predictors of student performance and satisfaction in management education. They conducted study that empirically examines different person-environment fit approaches.

Oldfield, B.M. and Baron, S. (2002) investigated student perceptions of service quality in higher education. Their focus was on the elements not directly involved with content and delivery of course units. Research was conducted using a performance-only adaptation of the SERVQUAL research instrument. Results suggested students' perceived service quality has three dimensions: "requisite elements", which are essential to enable students to fulfill their study obligations; "acceptable elements", which are desirable but not essential to students; and "functional elements", which are of a practical or utilitarian nature.

Appleton-Knapp, S.L. and Krentler, K.A. (2006) investigated the relationship between student expectation and their satisfaction. The results of analysis show that students whose expectations were exceeded were more satisfied then those whose experience fell short of expectations.

Strachota, E. (2006) analyzed student satisfaction in online courses. Final instrument included seven items that measured learner-content interaction, six items that measured learner-instructor interaction, eight items that measured learner-learner interaction and six items that measured general satisfaction. Through the use of multiple regression analysis revealed that three of the four constructs significantly contributed to the prediction model for online satisfaction whereas learner-learner interaction did not significantly contribute to the prediction model.

Letcher, D.W. and Neves, J.S. (2008) conducted an analysis of the determinants of overall student satisfaction using the Undergraduate Business Exit Assessment. A factor analysis of the student's responses resulted in the determination of eight factors of satisfaction. Regression results show that advising and quality of teaching in the subject have little or no effect on overall student

satisfaction. Self-confidence, extra-curricular activities and career opportunities, and quality of teaching in general are the factors with greater impact on satisfaction.

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As combination of statistical methods, SEM aims to explain the relationship among multiple variables. By doing that, it examines the structure of interrelationships expressed in a series of equations that depict all of the relationships among constructs (the dependant and independent variables) involved in the analysis. Constructs are unobservable or latent factors represented by multiple variables (much like variables representing a factor in factor analysis).

SEM has the ability to incorporate latent variables in the analysis, as it can be measured indirectly by examining consistency among multiple measured variables, sometimes referred to as manifest variables, or indicators, which are gathered through various data collection methods (e.g., surveys, tests, observational methods). Confirmatory factor analysis (CFA) is used to test how well measured variables represent the constructs. When specifying the number of indicators per construct it is recommended to use four indicators (overidentified model) whenever possible, having three indicators per construct (just-identified model) is acceptable if other constructs have more then three and constructs with fewer that three indicators should be avoided (underidentified model). Exogenous and endogenous latent constructs, described earlier in Introduction, are presented in Table 1.

Table 1. Observed indicators that are identifying constructs

<table>
<tr><th colspan="4">Exogenous constructs</th><th>Endogenous construct</th></tr>
<tr><th>Organization and Curriculum</th><th>Staff</th><th>Extracurricular activities</th><th>Financial aspects</th><th>Students` satisfaction</th></tr>
<tr><td>Faculty’s name and reputation</td><td>Faculty staff professionalism</td><td>Students` organizations</td><td>Tuition fees</td><td>Courses curriculum</td></tr>
<tr><td>Infrastructure</td><td rowspan="2">Faculty staff accessibility</td><td>Students` restaurants</td><td rowspan="2">Availability and number of scholarships</td><td rowspan="2">Feeling of belonging and acceptance</td></tr>
<tr><td rowspan="2">Faculty’s accessibility and number of available parking places</td><td rowspan="2">Internship opportunities</td></tr>
<tr><td rowspan="2">Courtesy and professionalism of non-educational staff</td><td rowspan="2">Additional costs of educational process</td><td rowspan="2">Practical implementation of learned skills and acquired abilities</td></tr>
<tr><td rowspan="2">Students` academic ability and motivation</td><td>Sports and entertainment facilities</td></tr>
<tr><td>Faculty staff being up to date with their respective fields</td><td>Programs of additional education and programs of mobility</td><td>Students` discounts and subsidies</td><td>Teaching process organization</td></tr>
</table>

In this model, a total of 54 parameters are estimated using maximum likelihood method (ML). Empirical studies have shown that maximum likelihood estimation is efficient and unbiased when the assumption of multivariate normality is met. The path diagram shows 32 estimated parameters (latent constructs were measured with 22 manifest variables, dependence between exogenous constructs were assessed with 6 parameters and 4 parameters indicate relationship between exogenous and one endogenous variable). In addition, 22 error variance terms are estimated, but not shown in the figure. Therefore, total of 54 parameters are estimated, with 199 degrees of freedom. Measurement model validity depends on goodness of fit indicator and specific evidence of construct validity. Goodness of fit indicator shows how well the model reproduces the covariance matrix, i.e. it quantifies the differences between the observed and estimated covariance matrices. The statistical inference of goodness of fit is based on chi-square test. Chi-square value of 372.695 with 199 degrees of freedom confirms that overall model fits at significance level less than 0.01. However, alternative measures of fit are usually used to correct for the bias against large samples. The possible range of these indicators is 0 to 1, while values greater than 0.85 are typically considered acceptable. The goodness of fit index (GFI) equals 0.877 which indicates model validity.

Among all estimated parameters only two are not statistically significant, i.e. direct effects of Staff and Extracurricular Activities on Students' satisfaction. However, their indirect effects can be computed by multiplying value of phi and gamma.

Table 2. Indicators of constructs validity with estimated direct and indirect effects on students' satisfaction

	Construct validity (average variance extracted)	Exogenous constructs dependencies			Direct effects	Indirect effects	Total effects
		Staff	Extracurricular activities	Financial aspects			
Organization and Curriculum	0.389	0.753	0.472	0.209	0.337	0.042	0.379
Staff	0.543		0.374	0.301	0.169	0.060	0.229
Extracurricular activities	0.512			0.541	0.072	0.109	0.181
Financial aspects	0.557				0.172	0.043	0.215
Students' satisfaction	0.776						

Conclusion

The objective of this research is to identify aspects of the educational experience that are associated with students' overall expression of satisfaction. Determining which features of the student experience are most closely related to satisfaction may provide information about actions that can be taken to maintain high levels of satisfaction and improve student learning. The measurement of student satisfaction can be useful to higher education institutions, to help them in identifying their strengths and areas for improvement.

Exogenous constructs are Organization and Curriculum, Staff, Extracurricular activities and Financial aspects. In this model, a total of 54 parameters are estimated using maximum likelihood method (ML). The path diagram shows 32 estimated parameters. In addition, 22 error variance

terms are estimated, but not shown in the figure.

Among all estimated parameters only two are not statistically significant, i.e. direct effects of Staff and Extracurricular activities on Students' satisfaction. Organization and Curriculum have the strongest direct and total impact on Students' satisfaction and Extracurricular activities have the strongest indirect, but the lowest total and direct impact on Students' satisfaction.

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