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Education satisfaction analysis for Manabi's technical university (UTM) students: SEM model

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Article Info

Abstract

In the realm of education, the assessment of service quality is intricately tied to institutional management and its alignment with student expectations. This study delves into the Ecuadorian educational landscape emphasizing the persistent challenges faced by the country, such as infrastructure deficiencies, inadequate teacher preparation, and a centralized system. To address these concerns and enhance educational quality, a substantial policy shift has been initiated, necessitating comprehensive evaluations and restructuring within educational institutions. This paper draws on a study conducted by Maluk (2022), which validates an instrument measuring university quality perception from students' viewpoints. Notably, student satisfaction emerges as a crucial factor, impacting overall educational quality. The research aims to develop a Structural Equation System Model (SEM) to systematically explore student satisfaction's multifaceted components. By evaluating academic experiences and aligning them with student expectations, this study provides valuable insights for policymakers and university rectors. The findings reveal that, for UTM students, academic course quality significantly influences satisfaction, followed by the impact of course activities, evaluations, and proactive elements. Surprisingly, teacher deficiencies show a minor negative impact, opening avenues for further research on teacher preparation and its implications for student satisfaction.

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Introduction

In the educational realm, service quality is associated with institutional management and is assessed based on the extent to which it meets students' expectations in their academic experience. The perception of quality, grounded in the satisfaction of needs and requirements, is linked to the effectiveness of institutional management. Academic satisfaction is understood as the overall assessment of students' experience at the university, encompassing both teaching services and study support services, as well as general services related to sports, culture, and communal development. This evaluation serves as an indicator for improving the management and development of academic programs (Vergara-Morales et al., 2018).

The discourse on education in Ecuador, according to Briones Rugel et al. (2011), remains a contentious topic with diverse opinions, primarily focused on the quality of education. The deficiency in education levels is a longstanding concern for Ecuador, posing a challenge for a developing society where education stands as a fundamental pillar for nation-building. Infrastructure inadequacies, insufficient teacher preparation, a centralized system, and low salaries are identified as major issues contributing to the observed illiteracy rate in the country (Rieckmann et al., 2021). These challenges directly impact the quality of education despite ongoing efforts by educational systems to implement strategies for continuous improvement. Failure to address these concerns, will perpetuate existing shortcomings in the education system.

Espinoza (2016) emphasizes the current significance of educational quality in Ecuador, noting that the government has embarked on a substantial policy shift to redefine the structures of the education system. These changes have prompted institutions within the educational sector to reevaluate their processes, procedures, and evaluations, necessitating a comprehensive restructuring in alignment with the new regulations imposed by educational organizations. The author underscores the need for continuous evaluation and measurement throughout the transformative process, aiming at enhancing educational quality.

Drawing on Morin's (1999) perspective, Espinoza highlights education as a dynamic process involving the acquisition of knowledge, skills, and attitudes. Morin's (1999) assertion that information must be placed in context to make sense resonates with the ongoing efforts in Ecuador to embed information in a meaningful context, as expressed by the author (Suasnabas-Pacheco & Juárez, 2020).

The COVID-19 pandemic has presented unprecedented challenges for universities at political, administrative, and pedagogical levels. Institutions had to swiftly transition to remote teaching to maintain educational continuity and quality amid the crisis. This shift highlighted existing social inequalities, exacerbated by digital divides and limited access to reliable internet. The pandemic also underscored the ongoing globalization of markets, the push for inclusive and diverse student populations, and the necessity of integrating information and communication technologies in educational settings. Additionally, the crisis affected international student mobility and emphasized the importance of academic consortia and partnerships in sharing resources. Universities must now foster collaborative efforts with students, focusing on efficiency and maintaining high standards in teaching and learning networks to navigate these challenges and continue delivering quality education.

Regarding higher education institutions (HEI), the Evaluation Model framework in Ecuador, as outlined by the Council for Evaluation, Accreditation, and Quality Assurance of Higher Education (Consejo de Evaluación, Acreditación y Aseguramiento de la Calidad de la Educación Superior [CEAACES], 2015), is organized around six evaluation criteria that cover comprehensive aspects of quality. These criteria relate to the essential functions of universities and polytechnic schools and the processes, conditions, and resources necessary for their effective operation. Evaluating attributes related to the fulfillment of functions and processes of HEIs involves identifying specific indicators for each criterion.

In this global context and theory, UTM which is going through a complete structural reform has the need to measure satisfaction from their operations. For this purpose, Maluk (2022) conducted a study to validate an instrument designed to measure latent variables related to university quality perceptions from the students' perspectives. This research, supported by the Council of Citizen Participation and Social Control (CPCCS) through the Observatory for Educational Quality, encouraged Ecuadorian universities to measure educational satisfaction and quality using a structured questionnaire developed by the agency.

As a result, the study identified 15 constructs, as illustrated in Table 1, which are applicable for widespread research and continuous quality improvement in Ecuadorian universities. Analyzing data from 782 university students, the study highlighted factors contributing to perceived quality variations among 10 universities. An exploratory regression model identified Quality as the final dependent variable, with Satisfaction as one of its main components.

Table 1 Latent variables as constructs derived from the exploratory factor analysis of the research questionnaire items

Variable	Description
Contents and Activities	Refers to the activities carried out within the course.
Evaluation	Relates to the assessment conducted by the professor on the students.
Exam Information	Pertains to the prior information given to students before exams.
Knowledge	Refers to what is taught in the subject.
Explanation	It is related to the professor's ability to explain.
Deficient Explanation	It is a construct that measures the professors' deficiencies in explaining.
Materials	The resources provided to students during the course.
Attitude	Refers to the students' attitude during the course.
Deficient Treatment	Is the deficient, inefficient, or mistreatment received by students from professors.
Attention to Difficulties	Relates to the type of attention the professor provides regarding the students' difficulties.
Satisfaction	Measures the students' satisfaction with the course.
Dissatisfaction	Measures the students' dissatisfaction with the course.

Given that satisfaction has the highest impact on the quality of education, the study proposes the national dissemination of the questionnaire to illustrate regressions between perception variables. This approach will help university managers address specific areas for improvement.

Further research offers valuable insights into assessing and enhancing university quality from a student's perspective, emphasizing the importance of aligning academic experiences with students' expectations for educational excellence.

This perspective is supported by prior research on university quality perceptions (Maluk, 2022). Other authors also relate students' satisfaction with education quality. In the assessment of perceived quality by Pereira-Puga (2014) The "nomological validity" is examined concerning graduates' overall satisfaction with their university experience. The findings confirm a positive and significant causal relationship between perceived quality and overall satisfaction, supporting the theory of expectation confirmation. This theory posits that perceived quality is the primary precursor to user satisfaction. The effectiveness of our quality scale in explaining satisfaction demonstrates the robustness of the constructed model.

Furthermore, it is emphasized that user satisfaction has been empirically verified as a direct precursor to loyalty, measured through university recommendations to family and friends, as well as the choice of the university for further education. These factors are crucial in a competitive environment among universities to attract and retain students (Jiménez-Bucarey et al., 2021).

In their 2009 research on student satisfaction and quality, (Mejías & Martínez, 2009) emphasize that satisfaction is a crucial aspect of quality in educational management. They explain that satisfaction involves adequately responding to the expectations, interests, needs, and demands of both the organization's staff and the students. Student satisfaction is defined as the students' overall sentiment towards their institution, stemming from the perception that their needs, expectations, and requirements are being met.

The research commissioned by the CPCCS emphasizes the importance of investigating student satisfaction as a crucial factor in the comprehensive evaluation of the quality of higher education institutions, as validated by the previous research. Therefore, there is a clear need for further professional inquiries focused on a detailed examination of student satisfaction, recognizing its pivotal role as a mediating variable in the broader discussion on educational quality.

The motivation behind this research is to develop a Structural Equation System Model (SEM) that helps to clarify the complex aspects of student satisfaction and systematically explores the various components within this multifaceted construct. This study will enable policymakers and university rectors to comprehend student satisfaction, one of the main variables related to quality. This information would be useful as a theoretical background for designing the internal processes and strategies of each higher education institution with the purpose of increasing better quality standards.

Literature Reviews

The satisfaction that students have with the education received has frequently been considered as a significant element in the assessment of the quality of education. Students are relevant when establishing who has quality and who does not (Gento Palacios & García Vivas, 2003). Academic satisfaction is presented as a dynamic process that can be influenced both by the characteristics of the institution and by the perception and understanding that students have of their learning environment (Medrano et al., 2014; Ramos et al., 2015). Its relevance lies in

its ability to explain various educational experiences, such as academic adaptation, social integration, well-being, persistence, academic performance, academic success, and student retention (Abarca Franco et al., 2013; Medrano & Pérez, 2010; Merino-Soto et al., 2016; Righi Schleich et al., 2006; Vergara-Morales et al., 2018).

Also, according to Tran et al. (2015) organizations subsidized by the state, such as universities, often exhibit a proclivity for neglecting the requirements of their respective target publics. In light of the contemporary and highly competitive environment, it is imperative for these institutions to embrace a more market-oriented approach. This entails a concerted effort to garner competitive advantages vis-à-vis their counterparts and cultivate a favorable image in close alignment with the preferences and expectations of their target market. The exploration of satisfaction in the academic context has been approached from various conceptual perspectives supported by diverse theoretical frameworks. Recent research has primarily focused on two perspectives: (1) that centered on service quality; and (2) that centered on psychological well-being (Vergara-Morales et al., 2018).

The repercussions of satisfaction within the realm of higher education diverge from the linear correspondence observed in other service sectors, given the distinctive characteristics inherent in state-sponsored education, characterized by its nonprofitable nature. While satisfaction in the majority of services is typically associated with outcomes such as complaint behavior, word-of-mouth actions, loyalty, repetitive purchasing behavior, and profit, the applicability of some of these consequences in the context of higher education is not readily evident. Pertaining specifically to higher education, researchers have identified principal consequences, including loyalty word of mouth and complaints (Athiyaman, 1997; Eskildsen et al., 1999; Webb & Jagun, 1997).

On the other hand, Marchesi and Martín (1998) determine that one variable that intends to measure the degree of quality for teaching, is students´ satisfaction within the educational process. They conclude that, given that students are the beneficiaries of education, it is up to them to value it and considerate it. Roca-Puig et al. (1998) mentions that the theory centered on quality, is indicating that it is still in an uncertain stage, especially in relation to the requirements of students, whose opinion is not explored.

The foregoing is ratified by Santos Guerra (1999) who, concerned about the participation of students so that they are allowed to formulate their perceptions about the processes in which they participate as involved, emphasizes that they are rarely consulted and that it is a little process in democratic participation, since they are not included in the evaluation, not allowing the opinion of the protagonists.

From the psihologic wellbeing standpoint, the contention is that satisfaction serves as a "cognitive element of psychological well-being, referring to the assessments individuals make when gauging their aspirations against their accomplishments" (Medrano et al., 2014, p. 545). These assessments encompass either the entirety of life or specific domains, such as the academic experience.

Within the academic sphere, satisfaction is characterized as the "well-being and pleasure that students perceive while engaging in experiences linked to their role as students" (Medrano & Pérez, 2010, p. 6). Another definition posits that academic satisfaction involves a "positive subjective evaluation by a student of various outcomes and experiences associated with education" (Alfaro Insunza, 2015, p. 75).

This concept can be regarded as a cognitive-affective variable, encompassing both the contentment of students and the assessment of their learning experiences. Academic satisfaction emerges as a pivotal factor in the evaluation of educational environments, facilitating the necessary adjustments to meet the needs of students (Alfaro Insunza, 2015; Righi Schleich et al., 2006; Vergara -Morales et. al., 2018).

In reference to satisfaction, Juste (2000) states that one of the dimensions of quality is the satisfaction of those involved. When a person expresses being satisfied, he issues a value judgment that, through an objective evaluation, reflects a perception derived from the cognitive and affective aspects of his consciousness, and thus satisfaction is defined, which is a favorable appreciation of the results of his past experiences, related to the education received, and that it has been for their needs and expected achievements.

Gento Palacios and García Vivas (2003) developed the questionnaire to measure student satisfaction called SEUE, in which satisfaction is the result of a process of adding values corresponding to 93 items of the scale used. A study aimed to investigate students' perception of the services offered to them at a German university and how satisfied they were. 15 dimensions of student satisfaction were measured (Gruber et al., 2010).

Thus, student satisfaction seems to reflect quite well the differences in perceived quality of the services offered and the broader environment. The students were satisfied with the school practices and the atmosphere among the students. They were also dissatisfied with the university buildings and the quality of the conference rooms (Gruber et al., 2010).

According to the authors Alves & Raposo (2007) in their study on the factors that positively influence the satisfaction of students in higher education, they showed that the variable that most influences the satisfaction of students in higher education is the image variable, followed by value and then perceived quality. On the other hand, the expectations variable has a negative impact.

Fernández Rico et al. (2007) mentions the ongoing academic exploration of the effectiveness of Spanish university education and the satisfaction levels of students, which are crucial considerations for the university system. Evaluative research, aligned with the emphasis on university quality assurance in the country, is guiding researchers to examine institutional factors related to both faculty and students, as highlighted by Tejedor and García-Valcárcel (2007). Despite institutional efforts, personal and contextual factors influencing students—such as academic success, delayed completion of studies, and dropout rates—have garnered significant attention in recent research. Cabrera Guillén (2002) conducted a comprehensive review of studies on university failure and dropout, highlighting the multifaceted nature of these issues. Further, Cabrera et al. (2006) examined the incidence of student-related variables in university dropout, emphasizing the importance of understanding individual circumstances. Additionally, Soares et al. (2006) applied psychological models to analyze factors contributing to student attrition, providing insights into the psychological underpinnings of dropout phenomena.

Academic contentment according to Vergara-Morales et al. (2018) is conceptualized as a dynamic process susceptible to influence from both institutional attributes and students' perceptions and comprehension of their learning milieu. Its significance stems from its capacity to shape the understanding of educational phenomena.

Also, Vergara-Morales et al. (2018) references that the exploration of academic satisfaction has been approached through various conceptual frameworks, underpinned by diverse theoretical perspectives. Current investigations align with two overarching viewpoints: (1) a focus on service quality, and (2) an emphasis on psychological well-being.

Analysis Techniques

Following the methodology of Fernández Rico et al. (2007) and Vergara-Morales et al. (2018), a structured questionnaire was developed using a five-point Likert scale, where 1 indicates "strongly disagree" and 5 indicates "strongly agree." The questionnaire items were based on the same constructs previously validated for measuring educational quality. Data collection was carried out by trained student assistants, each supervised by a faculty member who had been trained in the content and purpose of the instrument. Before administration, each supervisor provided a brief explanation to the students in class. Classes were randomly selected for inclusion in the study.

In line with the research gap identified by Maluk (2022)—who highlighted the absence of student perception in the national quality assessment models used by Ecuadorian higher education authorities—the current study adopted the hypotheses proposed in that research. These hypotheses were tested through structural equation modeling (SEM) in the case of Universidad Técnica de Manabí (UTM). The full list of hypotheses tested in the SEM model is presented in Table 2.

With the items of the research questionnaire, five main components were found by reduction of dimensions and varimax rotation. A univariate analysis was performed for the dependent variable. The significance of the coefficients was assessed with an ANOVA and 95 percent confidence, the homogeneity test of the Levene variance was done. A multiple stepwise regression was performed for the student satisfaction as a dependent variable, and the reduction of dimensions to obtain the main components was done by varimax rotation.

Table 2 Hypotheses tested in the model for UTM students' satisfaction – SEM validation

Hypothesis	Statement
H1	Academic quality has a positive impact on student satisfaction.
H2	Activities of students and teachers have a positive impact on student satisfaction.
H3	Course content has a positive impact on student satisfaction.
H5	The attitude of students has a positive impact on student satisfaction.
H6	The treatment by teachers has a positive impact on student satisfaction.
H7	Professor deficiencies have a positive impact on satisfaction.
H8	Materials have a positive impact on student satisfaction.
H9	Evaluation has a positive impact on student satisfaction.

Note: Hypotheses adapted
Source: Maluk (2022)

The obtained constructs passed Cronbach's Alpha reliability test over 0.70, some items were included, given the importance of their contribution to communality, despite the fact that their loads within the component were between 0.5 and 0.7.

Then a model was built in systems of SEM. Convergent validity and discriminant validity were tested for the model, and a confirmatory structural equation was achieved.

Principal Component Analysis

An analysis of principal components with dimensions reduction by varimax rotation was carried out, having captured 61.26 percent of the explained variance, the results shown in

Table 3 were the following: Contents of activity and evaluation ContActiEval (10 items). Teachers Deficiency (9 items). Academic quality of the course CalidAcadCurso (8 items). Student satisfaction SatisfacEstud (6 items) and course proactivity ProactCurso (5 items).

The dependable variable was SatisfactEstu shown in Table 4 is about in between-subject effects, which gave statistically significant values to the model's latent variables and physical facilities. Neither age, nor gender, nor career, nor host city, nor educational level, not even the interactions between them, was significant. Here is the translation of the headings provided:

The multiple linear regression analysis, conducted in successive steps for the dependent variable (student satisfaction), shows that the frequency distribution of SatisfacEstud has a typical deviation that is normal. The tolerance index is 0.560, which is less than one, indicating low multicollinearity. The variance inflation factor (VIF) is 1.787, also below two, further confirming low multicollinearity. Additionally, the Durbin-Watson statistic is 1.763, indicating no significant autocorrelation. The adjusted R^2 is 0.679, an improvement over the initial R^2 of 0.557 from the model.

Table 3 Results of the principal components analysis with varimax normalization and kaiser

	Rotated components matrix				
	Components				
Items	1	2	3	4	5
P1	0.744				
P2	0.751				
P3	0.731				
P4	0.704				
P5	0.748				
P6	0.687				
P7	0.725				
P8	0.690				
P9	0.732				
P10	0.672				
P15		0.651			
P23		0.687			
P24		0.755			
P26		0.724			
P31		0.762			
P40		0.776			
P42		0.702			
P43		0.748			
P46		0.675			
P34					0.634
P35					0.687
P36					0.709
P37					0.713
P38					0.692
P64			0.540		
P65			0.506		
P66			0.579		
P67			0.577		
P68			0.697		
P69			0.761		

Table 3 Continued

Items	1	2	3	4	5
			Rotated components matrix		
			Components		
P70			0.716		
P71			0.653		
P58				0.613	
P59				0.583	
P60				0.655	
P61				0.665	
P62				0.646	
P63				0.685	

Table 4 Analysis of Within-Subjects Effects: Student Satisfaction as the Dependent Variable

Source	Sum of Squares Type III	df	Mean Square	F	p
Corrected Model	326.315	130	2.510	10.628	< .001
Intercept	0.436	1	0.436	1.795	.181
ContActEval	7.794	1	7.794	32.069	< .001
DeficProfess	1.313	1	1.313	5.403	.021
ReacCurso	6.431	1	6.431	26.462	< .001
CalidadAcadCurso	29.840	1	29.840	122.783	< .001
BajaCalidUnivers	0.339	1	0.339	1.393	.238
InstalFísicas	2.277	1	2.277	9.669	.002
CITY	3.964	22	0.180	0.741	.797
LEVEL	2.258	8	0.282	1.161	.327
CAREER	5.127	23	0.223	0.917	.575
CITY * LEVEL	3.835	10	0.384	1.583	.105
CITY * CAREER	4.001	9	0.445	1.829	.061
LEVEL * CAREER	2.403	9	0.267	1.097	.330
CITY * LEVEL * CAREER	0.000	0	-	-	-
Error	107.419	442	0.243		
Total	950.333	573			
Corrected Total	433.755	572			

Note: Dependent variable: *Student Satisfaction (SatisfacEstud)*, Adjusted R^2 = .679.
$p < .05$ indicates statistical significance.

The Table 5 presents the coefficients of multiple linear regressions, carried out in successive steps. It provides a detailed breakdown of non-standardized coefficients, typified coefficients, correlations, and multicollinearity statistics. It demonstrates the significance and strength of various predictors across different regression models while considering multicollinearity aspects.

Table 5 Coefficients of multiple linear regressions, by successive steps

Model	Variable	B	SE	Beta	t	p	Zero-order	Partial	Semi-partial	Tolerance	VIF
1	Intercept	0.967	0.115	–	8.428	$p < .001$	0.747	0.747	0.747	1.000	1.000
	Academic Quality	0.793	0.030	0.747	26.841	$p < .001$	–	–	–	–	–
2	Intercept	0.384	0.115	–	3.344	$p = .001$	–	–	–	–	–
	Academic Quality	0.544	0.034	0.512	15.938	$p < .001$	0.747	0.555	0.399	0.607	1.648
	Course Practices	0.384	0.033	0.374	11.648	$p < .001$	0.695	0.438	0.292	0.607	1.648
3	Intercept	0.086	0.117	–	0.732	$p = .464$	–	–	–	–	–
	Academic Quality	0.463	0.034	0.436	13.458	$p < .001$	0.747	–	0.322	0.545	1.833
	Course Practices	0.287	0.034	0.280	8.421	$p < .001$	0.695	0.333	0.202	0.518	1.932
	Activities & Evaluation	0.245	0.033	0.234	7.393	$p < .001$	0.655	0.296	0.177	0.569	1.756
4	Intercept	0.178	0.125	–	1.422	$p = .156$	–	–	–	–	–
	Academic Quality	0.482	0.036	0.454	13.557	$p < .001$	0.747	0.494	0.324	0.507	1.971
	Course Practices	0.284	0.034	0.277	8.344	$p < .001$	0.695	0.330	0.199	0.517	1.936
	Activities & Evaluation	0.243	0.033	0.232	7.347	$p < .001$	0.655	0.295	0.175	0.569	1.758
	Faculty Deficiencies	-0.046	0.023	-0.051	-2.049	$p = .041$	0.151	-0.086	-0.049	0.909	1.100

Table 5 Continued

Model	Variable	B	SE	Beta	t	p	Zero-order	Partial	Semi-partial	Tolerance	VIF
5	Intercept	0.173	0.125	–	1.389	$p = .165$	–	–	–	–	–
	Academic Quality	0.469	0.036	0.442	13.000	$p < .001$	0.747	0.479	0.309	0.490	2.039
	Course Practices	0.258	0.036	0.252	7.098	$p < .001$	0.695	0.286	0.169	0.451	2.220
	Activities & Evaluation	0.239	0.033	0.228	7.214	$p < .001$	0.655	0.290	0.172	0.566	1.766
	Faculty Deficiencies	-0.058	0.023	-0.065	-2.498	$p = .013$	0.151	-0.104	-0.059	0.849	1.177
	Physical Facilities	0.058	0.029	0.064	1.997	$p = .046$	0.534	0.084	0.048	0.560	1.787

Note: $p < .05$, $p < .01$, *$p < .001$.

Based on the provided table, we can identify the final and most significant model by examining the *p-values* (Sig.) and standardized coefficients (Beta) for each predictor. The final model 5 includes all predictors and assesses their significance and contribution to the dependent variable as shown in Table 6.

With the positive results from the regressions between the variables, we followed the steps of successive regressions to build the final model for evaluation by SEM (Structural Equation Modeling). The measurement model converged, with covariances within acceptable ranges. Then, the structural model also converged, and we tested its convergent validity and discriminant validity.

The KMO and Bartlett tests were significant. The impact coefficients of the model for student satisfaction (SatisfacEstud) resulted as follows and as shown in Figure 1: Proposed model of students' satisfaction.

- 0.25 for Continuous Evaluation Activities (ContActiEval)
- 0.55 for Academic Quality of the Course (CalidAcadCurso)
- 0.29 for Course Proactivity (ProactCurso)
- 0.043 for Teacher Deficiency (DeficProfes)

The model fits well with a chi-square of 2325 and 661 degrees of freedom. The goodness of fit indicators were acceptable, with an RMSEA of 0.066 (close to 0.05), a CFI of 0.872 (close to 0.90), a TLI of 0.864 (close to 0.90), an SRMR of 0.218, and a CD of 1.0.

Figure 1 SEM model for students satisfactions in Techical Universiy of Manabí

Results and Discussion

The quality of education is a critical concern for university administrators as it directly impacts the reputation of the institution, student satisfaction, and overall success of the academic programs. One of the dimensions, that has had low consideration in Ecuador, is the satisfaction of students. Satisfied students are more likely to perform well academically, complete their programs, and become advocates for the university. Administrators recognize the importance of meeting or exceeding student expectations in terms of teaching quality, resources, and support services.

Table 6 Summary of the model

Model	R	R^2	Adjusted R^2	SE of the Estimate	ΔR^2	ΔF	df_1	df_2	p	Durbin-Watson
1	0.747	0.558	0.557	0.57953	0.558	720.417	1	571	$p < .001$	–
2	0.802	0.643	0.642	0.52130	0.085	135.684	1	570	$p < .001$	–
3	0.821	0.674	0.672	0.49838	0.031	54.654	1	569	$p < .001$	–
4	0.823	0.677	0.674	0.49698	0.002	4.197	1	568	$p = .041$	–
5	0.824	0.679	0.676	0.49568	0.002	3.986	1	567	$p = .046$	1.763

Note: - Predictors:
  - Model 1: Academic Quality (*CalidAcadCurso*)
  - Model 2: Academic Quality, Course Practices (*PoactCurso*)
  - Model 3: Academic Quality, Course Practices, Activities & Evaluation (*ContActiEval*)
  - Model 4: Academic Quality, Course Practices, Activities & Evaluation, Faculty Deficiencies (*DeficProfes*)
  - Model 5: Academic Quality, Course Practices, Activities & Evaluation, Faculty Deficiencies, Physical Facilities (*InstalcFisicas*)
 - Dependent variable: *Student Satisfaction (SatisfacEstud)*
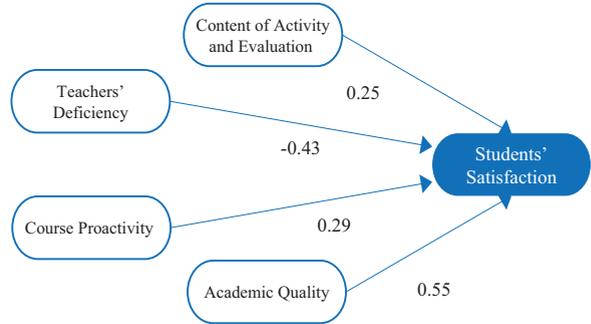 - *p* values are two-tailed and italicized in accordance with APA style.

In this paper, we are aiming to build a SEM (Structural Equation Modeling) model to understand UTM students' satisfaction, as shown in Figure 1. The equation for our validated SEM model can be written as follow (Equation (1)):

$$SatisfacEstud = .25 * ContActiEval + .55 * CalidAcadCurso + .29 * ProactCurso - .043 * DeficProfes + E \quad (1)$$

The model suggests that the academic quality of courses has a significant positive impact (+.55) on student satisfaction. The content, activities, and evaluations have a moderate positive impact (+.25), as does the proactivity of the course (+.29). On the other hand, teacher deficiencies have a very low negative impact (-.043) on student satisfaction.

The crux of this equation lies in the pivotal consideration that UTM university students give to the academic quality of the courses when assessing their own satisfaction. Implicit in this acknowledgment is the understanding that a university possesses a meticulously designed curriculum, comprehensive content, and cutting-edge learning tools tailored to meet the generational needs of the students while remaining at the forefront of academic knowledge. Furthermore, a 25 percent impact is attributed to the desire among students for transparency in the grading process of their respective subjects, including the content covered in these assessments.

Additionally, it is noteworthy that, contrary to the expectation that the quality of teachers or the teachers teaching deficiencies themselves would serve as a decisive factor, the perspective from the student satisfaction at the UTM reveals a relatively minor negative impact. This intriguing scenario prompts further investigation, raising questions regarding whether all teachers uniformly contribute to this impact, whether positively or negatively. Essentially, this implies a perceived homogeneity in the level of preparation among teachers from the students' standpoint. The underlying reasons for this phenomenon remain undisclosed in the present research.

Consequently, it would be prudent to assess teacher preparation by university and apply this analytical instrument on those universities where students more keenly perceive these differences. This adaptable model can be effectively deployed in Ecuadorian universities, given its statistical validation and robust nature. Its potential replication in diverse university settings would facilitate an exploration of whether the observed factor relating to teacher efficiency remains consistently valid.

For a university, having a model to measure students' perceived satisfaction is a valuable tool for making academic decisions. Although teacher efficiency is not a major factor, it is worth exploring why this is the case for UTM students.

Future research could include other external variables related to teachers' training to see if these factors become more significant. If they do not, this could suggest a need for public policy reform. Currently, the government requires high levels of education and experience for teachers, but this does not significantly boost student satisfaction. This suggests that PhDs may not necessarily need to be involved in teaching and that other types of tutoring experts could be considered.

Conflict of Interest

The authors declare that there is no conflict of interest.

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