

# Loyalty in Education: MOdelliNg The RELationship Environment

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*Abstract– This research studies the variables that affect loyalty of university students to their educational institutions. Three main variables have been identified: quality, satisfaction, and trust. Loyalty contributes to student retention, as well as word of mouth recommendation from the student. As students leave their higher education institutions before completing their careers, the student population decreases. For private institutions, the monetary income for the institution decreases. For public institutions, the efficiency of the institution decreases, and public resources are wasted. The project will answer the research question: What are the variables that influence student loyalty to their higher education institutions? The hypotheses will propose an answer to the research question and will help improve loyalty. The model proposed in this research will contribute to understand loyalty. The final report of the project will give recommendations to increase the loyalty of university students to their educational institutions.*

**Keywords-- Loyalty, education, satisfaction, trust, quality.**

## I. INTRODUCTION

In a general context, education has been described as a business [1]. In this context, higher education institutions seek the loyalty of students who are their customers [2], to gain retention and a positive word of mouth recommendation. Student loyalty is used to measure and generate student retention for a full career, and even bring students back after graduation [3]. Ref. [4] studied the influence that the quality perceived by students has on the intention of continuity and the willingness to recommend a course at a university. Quality is perceived not only in the academic service, but also in the administrative service, additional services, and the user interface in the virtual learning environment. Increasing the perceived quality of service and the level of satisfaction will increase loyalty and willingness to recommend the university. Academic institutions are trying to retain students and strengthen word of mouth recommendation [2]. Another benefit is the support that higher education institutions receive from their graduates, such as donations and sponsorships [5]. Student loyalty is essential for educational institutions to be profitable [4]. For public educational institutions, efficiency is understood instead of profitability. There is concern about the dropout rate of students [3], therefore higher education institutions will directly benefit from this study. The current situation of social isolation due to the pandemic introduces a new element of justification for the proposed model [6].

In Latin America, enrolment in higher education has risen, while graduation and persistence rates are low, due to dropout [7]. Therefore, this project will answer the research

question: *What are the variables that influence student loyalty to their higher education institutions?* The answer will be given by this study about Loyalty in Education, MOdelliNg The RELationship Environment. The acronym for the study is LEMONTREE.

In the next section, a background on loyalty in higher education institutions will show the state of the art in this theme and will compare research instruments from different authors. The third section will describe the methodology used. The fourth section will show the results and next there will be a section to discuss the results.

## II. BACKGROUND

It is possible to identify variables that affect the continuous work of academic institutions to improve institutional results in terms of business and profitability. The relationship between academic institutions and students as their clients has been described by various authors. Ref. [8], at the beginning of the century, proposed a model that included quality, commitment, and integration in the achievement of loyalty. In their research they developed an instrument to measure the variables of their model. Ref. [3] developed a model based on quality, satisfaction, trust, and commitment to achieve positive word of mouth; in their model, loyalty is an intermediate variable. In a marketing environment, private universities compete to attract and retain students until they complete their studies and continue at a higher level [9]. Student loyalty in the higher education sector helps university administrators establish appropriate programs that promote, develop, and maintain successful long-term relationships with current and former students [10]. Table I presents a list of previous studies and models.

### A. State of the Art

The model on student loyalty developed by [8], proposes that student loyalty is determined mainly by the dimensions of the quality of the relationship. Their model proposes an integrative approach with a relationship between quality and student loyalty. In turn, loyalty improves retention, generates positive word of mouth, and encourages graduates to support their institutions by making donations. The questionnaire by [8] was applied for the first time in a public university to final year students of the Faculty of Industrial and Systems Engineering. Ref. [16] and [17] in other studies, observed the influence of service quality on student satisfaction and loyalty in higher institutions.

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TABLE I  
PREVIOUS STUDIES

Authors (Year), Country, N = Sample size (if available) in number of students	Input Variable(s) (Independent Variable)	Output Variable(s) (Dependent Variable)
Hennig-Thurau et al. [8] (2001), Germany, N = 1,162	Perceived quality of education	Loyalty
Rojas-Méndez et al. [3] (2009), Chile, N = 752	Service quality	Word of mouth
Carvalho and Mota [11] (2010), United States	Trust	Student loyalty
Beatty et al. [12] (2012), United States, N = 685	Benefits of the relationship	Word of mouth
Macedo et al. [13] (2012), Brazil, N = 352	Perceived quality	Retention
Mulyono [9] (2014), Indonesia, N = 500	Image	Student loyalty
Annamdevula and Bellamkonda [10] (2016), India	Service quality	Student loyalty
Martínez-Argüelles and Batalla-Busquets [4] (2016), Spain, N = 1,870	Teaching	Willingness to recommend
Baber and Khattak [2] (2017), Pakistan, N = 348	Teaching dynamics	Word of mouth
Encinas and Cavazos [14] (2017), Mexico, N = 476	Normative commitment	Loyalty
Erciş et al. [15] (2012), Turkey, N = 390	Perceived quality	Intention to buy again
He et al. [5] (2017), China, N = 359	Professor's styles for interacting	Student loyalty
Chandra et al. [16] (2018), Indonesia, N = 1,000	Service quality	Student loyalty
Ganić, et al. [17] (2018), Bosnia Herzegovina, N = 265	Tangibility	Student loyalty
Ismanova [18] (2019)	Service quality	Student loyalty
Li and Carroll [19] (2020), Australia, N = 193,464	Student satisfaction	Dropout

**Loyalty.** Loyalty is the continuity of the relationship by the client, it is the client's decision, having evaluated all the variables, to continue the relationship with the supplier. The customer might not want to be loyal, but they have no better choice, so they remain loyal. Loyal customers can be passive (silent) in recommending the relationship. However, their active recommendation through word of mouth is a manifestation of loyalty and should be encouraged by the provider. Ref. [3] focused on loyalty that involves an identifiable behavioral intention, which provides a competitive advantage because a) finding new students is more expensive than working with current students, and b) graduates after graduation continue to support their academic institution through financial contributions. Student loyalty improves the sustainability and survival rate of higher education institutions [18]. The loyalty states observed in this research are summarized in fig. 1.

**Word of Mouth.** Word of mouth is the recommendation resulting from loyalty. Positive word of mouth consists of describing the reasons for consumer satisfaction, with a final recommendation to use the recommended product or service. Negative word of mouth consists of listing complaints about the product or service, generally in an aggressive tone, with a final recommendation not to use the product or service. A neutral word of mouth (without saying anything) is the result of minimal satisfaction, in which any minor complaint is neglected. Word of mouth is a sign of loyalty. Loyalty does not always lead to word of mouth; however, the provider wants to encourage positive word of mouth. Positive word of mouth from loyal customers persuades more customers [2]. In the relationship between students and academic institutions, the trust of students in their service provider organizations and the personalization of academic institutions to their students generate positive word of mouth among students.

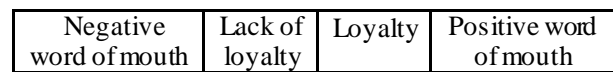


Fig. 1 States of loyalty

**Satisfaction.** Satisfaction is the perception that the consumer has provided a solution to a need. This need can change over time. The customer who contacts different potential suppliers will reshape the satisfaction of the need until a minimum satisfaction threshold is reached. Ref. [10] proposed a model that links service quality and student loyalty through student satisfaction; then student loyalty helps establish, develop, and maintain long-term relationships with former students. Satisfaction, together with trust and commitment, mediate the relationship between service quality and student loyalty [18]. Ref. [20] found the influence of generic-academic competences on students' satisfaction, and of satisfaction on students' loyalty to their higher education institution. Satisfaction as an intermediate variable has been related to loyalty by several authors in table I. In this research, the hypothesis H1 will be:

*H1: In a university environment, satisfaction is related to loyalty*

**Trust.** Trust is a feeling in advance that satisfaction will be achieved. The consumer initiates or continues a relationship with a provider based on trust, although results have not yet been achieved, at least not in this current relationship. The provider's written or oral offer, along with possible successful outcomes from previous relationships, will build this trust. Based on trust, the consumer will risk scarce resources to start and continue the relationship. Trust mitigates the risk of one-party taking advantage of another's vulnerability [21]. The study of trust is not alone, trust is associated with satisfaction, affective commitment, and commitment to continuity as intervening variables to achieve loyalty and the intention to buy again [15]. Brand equity, value and quality influence trust and satisfaction. In turn, trust and satisfaction affect affective

commitment and commitment to continuity [15]. Trust mediates the effect of student satisfaction on student loyalty [9]. Trust is another cause of loyalty. The next hypothesis is:

*H2: In a university environment, student trust is related to loyalty.*

**B. Conceptualization of Quality in The Relationship**

Ref. [10] demonstrated the mediating role of student satisfaction between quality of service and student loyalty. The quality of service was found to be an important contribution to student satisfaction. Ref. [22] in a transnational study empirically tests a model that explains the ways in which trust and commitment lead to loyalty in the organization-user relationship. Their findings indicate that while trust and commitment are important in the formation of behavioral loyalty in both Latin America and the United States, this relationship is mediated by cognitive and affective loyalty. Ref. [23] found the impact of the quality of academic service on student loyalty and satisfaction, and the impact of student satisfaction on student loyalty. Ref. [3] examined the pathways between the key factors that affect student loyalty in the following order: perceived service quality, satisfaction, trust, and commitment.

Quality. Quality is perceived in aspects that the consumer appreciates, far from what the supplier thinks is best for the consumer. In choosing an academic institution, the authors have observed processes over time (PT), which are shown in fig. 2: a) Quality of infrastructure and academic offer [8]. Ref. [24] suggests a list of available infrastructure as shown in table II. b) Quality of administrative services [3] and [16]. c) Quality of student care [4]. d) Quality of academic staff [5].

Next, the following relationships are proposed:

*H3: The quality of the infrastructure and the academic offer are related to satisfaction.*

*H4: The quality of the infrastructure and the academic offer are related to trust.*

*H5: The quality of administrative services is related to satisfaction.*

*H6: The quality of administrative services is related to trust*

Hypotheses H1 and H2 show the relationship of loyalty with an environment of quality, having satisfaction and trust as intermediate variables.

Commitment. Commitment stems from consumers, their beliefs, habits and will. In commitment, people promise about their behavior [25]. Commitment is a decision between choice opportunities. Ref. [12] described the commitment as of three

<b>QUALITY</b>	Quality: Infrastructure and academic offer	Quality: Administrative services	Quality: Student care	Quality: Academic staff
<b>PROCESSES IN TIME</b>	Evaluation of alternatives / Enrolment	Payment	Academic services	Student professor relationship

Fig. 2 Processes and quality along time

types: a) In affective commitment, individuals want to stay; b) in calculating commitment, individuals must stay; and c) in normative commitment, individuals feel a personal obligation and a social pressure to stay. Ref. [26] investigated how business families use informal family governance mechanisms to increase commitment to the family business. Their use of commitment is based on a state of mind that drives action and applies the concept to the family business. It is observed that the commitment intervenes in the model, but its inclusion is left for the next chapter.

**C. Research Instruments from Different Authors**

Research publications on loyalty include different types of businesses. Loyalty to universities and higher education institutions (HEI) is no exception. In addition to the variables in Table I, other authors can achieve a research methodology adapted to university and HEI environments. Three examples follow.

Ref [27] in his model included student satisfaction, reputation, and loyalty. Student satisfaction was measured with respect to academic quality, quality of administration, quality of social life, quality of infrastructure, and quality of support services. To measure loyalty, [27] used the Likelihood of recommending college, Attend the same college if starting over, and Likelihood of returning to the same college to continue studies. All indicators were measured on a five-point Likert scale. Ref [27] applied the Confirmatory Factor Analysis as part of the Structural Equation Modelling to validate the relationship between the observed items and their constructs to which they belong, achieving validity and reliability.

TABLE II  
INFRASTRUCTURE

1	Classroom
2	Laboratories
3	Libraries
4	Staffrooms / Offices
5	Sporting facilities
6	Workshops for vocational education
7	Virtual library: Computers and Internet
8	Toilet facilities
9	Dining area for students: Meals at break times
10	Sick bay
11	Recreational facilities
12	Assembly hall

Ref. [24]

Ref. [28] chose a public university, because in Spain public universities represent 60 per cent of the university system (50 out of 84). Their data was collected through an online survey, publishing it on social networks and requiring the dissemination of the survey. They used a Likert scale from 0 to 10. Convergent validity was achieved with the mean variance extracted (AVE) greater than 0.5 and discriminant validity less than 0.85.

Ref. [29] studied the intensity of use and commitment as causes related to brand loyalty. The students in his sample were between 18 and 23 years old, and a division was made between public and private universities. Cronbach's Alpha, Dillon-Goldstein and AVE coefficients achieved reliability. The cross loadings were able to achieve discriminating validity and convergence.

In this research, the measurement instruments of [8] and [16] encompass the constructs mentioned by other authors.

### III. METHODOLOGY

This research will be an empirical, explanatory, and cross-sectional study [14], [30]. To test the input data, the research will test the convergent and discriminant validity [14]. The data will then be used in a correlation study between constructs [5], [14]. A structural equation model will give the values for the coefficients that relate constructs [14], [16]. Given the various variables, this research recognizes that each model presented by the different authors in Table I will adjust to a different situation. The Peruvian situation related to public and private universities is not necessarily based on the same variables, nor on all the variables described above. However, there is no way to anticipate the most representative variables other than to collect data and test the most representative values that will support a proposed model. A combination of the questionnaires proposed by [8] and [16] shown in appendix table AI collects data. With an initial sample of 32 students surveyed, the necessary sample size is calculated with (1) as suggested in [31]:

$$N = z^2 \sigma^2 / d^2 \quad (1)$$

From the initial sample, a maximum variance of 2.41 and an average of 0.72 in the responses are obtained, which are established as values of  $\sigma$  and  $d$ . With  $z = 1.96$  for a confidence level of 95 per cent,  $N = 43$  is obtained. The available sample of 88 students from the last year in the career of systems engineering at two public universities in the city of Lima is more than two times the recommended size. The original questionnaire shows constructs and gathers items under each construct. However, for the sample used, this grouping of items using the load factors given with a confirmatory factor analysis shows that the items are not grouped together according to the order of the questionnaire.

The factor analysis is performed again, this time exploratory, grouping the items ordered according to their factor load and with eigenvalues greater than 1. The new grouping method results in a smaller set of constructs, grouping the items according to their loads. The result is good according to the KMO values and Bartlett's test of sphericity, which are shown in Table AII in Appendix. The structure matrix in Table AII in Appendix shows the new grouping of items and produces only nine factors. The mean variance extracted (AVE), composite reliability (CR) and H-index are also calculated for each of the nine factors [32].

### IV. RESULTS

The final grouping of the factors in Table AII produces the constructs shown in Table III. This new grouping determines the items that evaluate each construct: some statements that belonged to different constructs have been joined under a single construct and others have changed the construct to which they belong. A correlation was found between the proposed variables, as shown in table IV. In the correlation matrix, the values confirm the relationships, thus confirming the six hypotheses: H1, H2, H3, H4, H5, H6. The correlation matrix shows that the Commitment and Integration constructs do not contribute to the model. New relationships also appear that contribute to the model: The quality of the infrastructure and academic offer is related to loyalty, but in the regression study a better prediction of loyalty is obtained with only the values of Satisfaction and Trust. With the hypotheses confirmed, the resulting model is proposed in fig. 3, which shows the regression coefficients, whose significance is in acceptable values lower than 0.01 and 0.05. The regression coefficients will allow the applicability of the model. A regression analysis proposes (2), (3) and (4).

$$\text{Loyalty} = 5.023 + 0.327 * \text{Satisfaction} + 0.218 * \text{Trust} \quad (2)$$

$$\text{Satisfaction} = 8.763 + 1.242 * \text{Q.Infrastr} + 0.897 * \text{Q.Administ.Service} \quad (3)$$

$$\text{Trust} = -0.410 + 0.430 * \text{Q.Infrastr} + 1.312 * \text{Q.Administ.Service} \quad (4)$$

The equations calculate the prediction for the next fifteen students. Then a new sample of fifteen students collects the new observed values for loyalty, satisfaction, and trust. A t-student test with (15+15-2) degrees of freedom and a confidence level of 95 per cent shows that the interval for accepted values is  $-2.0484 \leq t \leq +2.0484$ . The values predicted by the regression equations fall within the accepted interval for the t-student test, as shown in table V.

TABLE III  
CONSTRUCTS FOR THE NEW MODEL ACCORDING TO ITEMS GROUPING BY LOADING FACTORS

CONSTRUCT IN THE NEW MODEL	CONSTRUCTS AND ITEMS IN THE ORIGINAL MODEL
SATISFACTION WITH THE QUALITY OF THE RESULTS	Quality: Exams 45:47 + Quality: Results 48:50 + Quality: Academic offer 34:35 + Quality: Academic staff 28:29 + Social integration 23 + Quality: Student care 37
LOYALTY	Loyalty 4 5 7 + Emotional commitment 13:15
INTEGRATION	Other social commitments 21 + Social integration 22 24 + Academic integration 25:27
QUALITY: Administrative services	Quality: Student care 39 + Quality Administrative services 41:42
COMMITMENT: With non-university activities	Time for my hobbies 19 + contact with my family 20
QUALITY: Infrastructure and academic offer	Quality: Academic staff 30 + Quality: Infrastructure 31:33 + Quality: Administrative services 44
COMMITMENT: Practical	Commitment: I chose this university for practical reasons 17
TRUST	Trust 9:12 + Quality: Student care 40 + Quality: Administrative services 43
WORD OF MOUTH	Relationship student to university 3 6 + Emotional commitment 16

TABLE IV  
CORRELATION MATRIX

		1	2	3	4	5	6	7	8	9
1	CorrelPearson	1	0.679**	0.322**	0.206	0.346**	0.749**	0.689**	0.609**	0.539**
Satisfaction	Sig (bilat)		0.000	0.002	0.054	0.001	0.000	0.000	0.000	0.000
2	CorrelPearson		1	0.363**	0.254*	0.276**	0.630**	0.586**	0.479**	0.603**
Loyalty	Sig (bilat)			0.001	0.017	0.009	0.000	0.000	0.000	0.000
3	CorrelPearson			1	0.042	0.008	0.190	0.368**	0.238*	0.146
Integration	Sig (bilat)				0.698	0.944	0.076	0.000	0.025	0.174
4	CorrelPearson				1	0.264*	0.225*	0.171	0.163	0.198
Commit: Practical	Sig (bilat)					0.013	0.035	0.111	0.130	0.064
5	CorrelPearson					1	0.219*	0.046	0.074	0.346**
Commit: NoUniAct	Sig (bilat)						0.041	0.668	0.492	0.001
6	CorrelPearson						1	0.661**	0.594**	0.402**
Q: Infrastructure	Sig (bilat)							0.000	0.000	0.000
7	CorrelPearson							1	0.763**	0.380**
Trust	Sig (bilat)								0.000	0.000
8	CorrelPearson								1	0.346**
Q: AdServ	Sig (bilat)									0.001
9	CorrelPearson									1
Word of Mouth	Sig (bilat)									

Note: \*\*. Sig < 0.01 (bilateral). \*. Sig < 0.05 (bilateral). Sample size N = 88

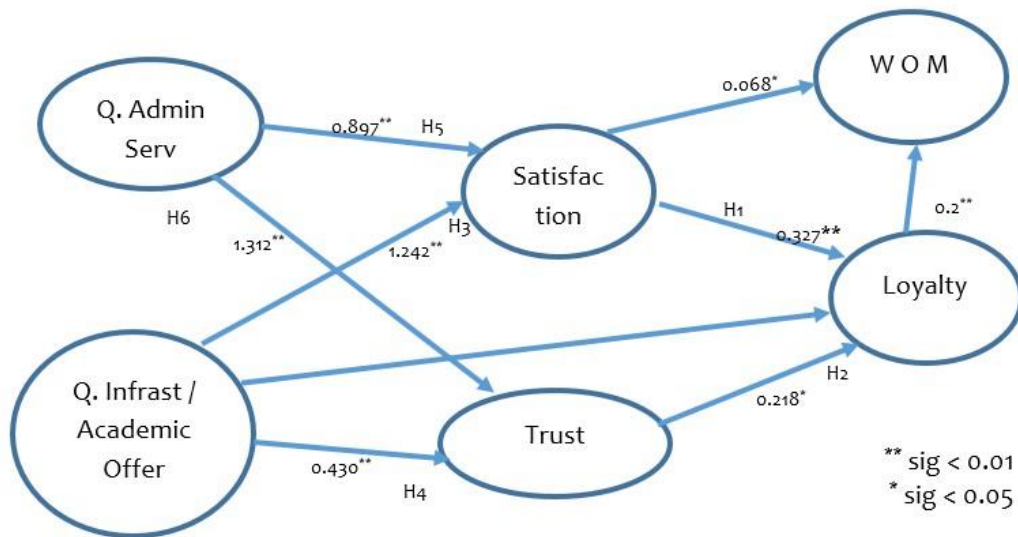


Fig. 3 Resulting model

TABLE V  
 PREDICTED VALUES OF LOYALTY, SATISFACTION AND TRUST USING THE REGRESSION MODEL

	Loyalty		Satisfaction		Trust	
	Observed	Predicted	Observed	Predicted	Observed	Predicted
1	27	30.529	58	59.478	30	32.17
2	17	19.52	33	40.434	17	19.568
3	20	25.406	45	43.47	26	22.622
4	9	16.468	27	26.91	12	10.88
5	27	29.766	55	53.613	31	29.138
6	22	21.918	39	37.95	19	18.708
7	22	26.932	49	48.438	27	24.342
8	25	26.169	48	41.676	25	19.998
9	19	22.572	45	32.223	13	11.718
10	29	30.202	55	53.061	33	26.944
11	24	26.387	48	41.331	26	20.88
12	29	29.766	55	59.478	31	32.17
13	25	27.477	50	54.303	28	27.374
14	25	26.605	48	53.613	27	29.138
15	17	25.842	49	42.711	22	17.352
$s^2_p=$	22.79244		47.68829		36.44854	
$t=$	-1.85701		0.841372		1.015016	

## V. DISCUSSION

This research began by collecting several proposed models about student loyalty. Although some of the variables found are relevant in the models in which they originated, they did not necessarily become relevant for this current model. The decision was supported with the loading factors in a factorial analysis.

From the literature reviewed, a questionnaire was developed to include the constructs suggested. The questionnaire is based on the model and hypotheses of the original research by [8] and [16]. The methodology adds new results for a population outside of Germany that brings together students from public universities. The purpose is to extend the original research to other countries.

An exploratory factor analysis confirmed some variables, disregarded other variables, and regrouped the confirmed variables around their respective constructs. The exploratory factor analysis shows the items that contribute to proposing the new constructs. The model thus confirmed has a solid theoretical support and an adaptation to the actual situation of the universities taken as a sample.

The model obtained indicates two intermediate variables to achieve student loyalty to their institution: Satisfaction and Trust. These variables in turn depend on quality aspects offered by the institution. The word-of-mouth variable is a

consequence of loyalty. Word of mouth increases retention and helps attract new students [2] [14] [17] [20].

## CONCLUSIONS

In the practical application of the model, the influence of quality in its various aspects should be used to increase loyalty. The mediation of the trust and satisfaction variables must also be considered, which can be measured to anticipate loyalty as a result.

One manifestation of loyalty is positive word of mouth. The resulting model shows that both loyalty and satisfaction influence word of mouth. Word of mouth is not only the retention of students, but even more, the recruitment of new students. Word of mouth does not have a visible cost, such as investment in advertising or recruitment campaigns. But word of mouth does have a cost throughout the student's presence in college, because of the cost of improving satisfaction.

## RECOMMENDATIONS

The quality of academic staff can be increased with a better assignment of teachers to courses, models exist for assigning teachers [33]. The quality of care for students should also be promoted, quality of care mitigates the decline in motivation to study and is a predictor of student motivation [34].

Capacity must be installed to provide high-quality infrastructure as a source of comparative advantage. This idea has been demonstrated, for example, in industries with intense logistics activity [35]. Ref. [24] in looking for the causes of the decline of public secondary schools in Nigeria, found through interviews with teachers, that the availability and adequacy of infrastructure is important for the delivery of quality education. It also found that inadequate funding, a lack of periodic monitoring, and a lack of infrastructure maintenance are responsible for the decay of infrastructure in schools.

Encouraging alumni-student mentoring programs brings potential benefits of integrating alumni with the university community [36].

Implementation of academic communities with the use of technology must be promoted. For example, one of the authors of this article uses the Moodle platform in which he has implemented courses for undergraduate, master, and doctoral students in Systems Engineering. Students who participate in these courses observe the quality of the information and the quality of the system and therefore increase their use of the platform.

The study was carried out in two public universities in the city of Lima. To broaden the study, a larger sample must be taken, encompassing public and private universities. To continue the study, the original measurement instrument [8] and [16] can be redesigned, adapting it to the new constructs proposed in table III.

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APPENDIX

TABLE AI. Survey used

Item	LOYALTY. If I had the opportunity
3	I would recommend my career to someone else
4	I would recommend my university to someone else
5	I am very interested in keeping in touch with my faculty
6	If I had to decide again, I would choose the same career
7	If I had to decide again, I would choose the same university
8	I will become a member of the alumni organisation at my university or faculty
Item	TRUST
9	Integrity describes the university staff
10	The university staff acts in my best interests
11	I trust the university staff completely
12	University staff always keep their promises to me
Item	EMOTIONAL COMMITMENT
13	I feel very attached to my university
14	I feel very attached to my faculty
15	I am proud to be able to study at my university
16	I am proud to be able to study the career
Item	OTHER COMMITMENTS
17	I chose this university for practical reasons
18	When I set targets for myself, I always reach them
19	I make sure I have enough time for my hobbies
20	I have close contact with my family and relatives
21	I spend part of my time doing a paid job
Item	SOCIAL INTEGRATION
22	I regularly take part in university-related leisure activities, such as sport or fairs
23	I always have intensive contact with my fellow students
24	I regularly do things with fellow students outside of university

Item	ACADEMIC INTEGRATION
25	I regularly take part in extra academic courses or events
26	I am a regular member of student academic groups set up on their own initiative
27	I regularly get involved with university committee work
QUALITY: ACADEMIC STAFF. Items 28 to 30	
28	Courses are well given
29	Professors are innovative and agents of change
30	Professors have good credentials
QUALITY: Infrastructure. Items 31 to 33	
31	Classrooms and study rooms are comfortable
32	Computational resources are available
33	Study rooms are available
QUALITY: Academic offer. Items 34 to 36	
34	Curricular content is up to date
35	Programs orientation and content are adequate
36	Programs objectives are explained to students
QUALITY: Student care. Items 37 to 40	
37	Professors are friendly and courteous
38	Administration takes care in the best of my benefits
39	Administrative staff is friendly and courteous
40	Students are rapidly informed of changes
QUALITY: Administrative services. Items 41 to 44	
41	Administration has capacity to solve problems
42	Administration has good knowledge about rules and procedures
43	Enrolment is done on time and with no errors
44	Records are kept accurately
QUALITY: Exams. Items 45 to 47	
45	Exams are fair and appropriately graded
46	Exams have the appropriate degree of difficulty
47	Exams evaluate what was done in class
QUALITY: Results. Items 48 to 50	
48	I am satisfied with the result of the learning process
49	I am satisfied with the result of courses, administrative services, exams, and service level I have received until now (office hours, tutorials)
50	Knowledge we receive will be useful for facing new challenges

Note: Based on the texts suggested by [8] and [16].

The questionnaire distributed is written in Spanish in paste tense.

TABLE AII. Results from the exploratory factor analysis

Kaiser Meyer Olkin: Sample adequation measure:	0.826
Barlett's sphericity test:	
Approximate Chi-square:	3652.497
Degrees of freedom:	1128
Significance:	0.000

Structure Matrix		
SATISFACTION		
Item	Loading factor	Cronbach's $\alpha$ / AVE / CR / H
46	.841	
45	.778	
47	.773	
48	.771	
50	.767	0.934 /
35	.731	0.506 /
28	.694	0.924 /
49	.670	0.932
34	.636	
23	.609	
37	.609	
29	.603	



LOYALTY		
Item factor	Loading AVE / CR / H	Cronbach's $\alpha$ /
15	.879	
13	.794	0.928 /
7	.792	0.549 /
4	.743	0.935 /
14	.705	0.944
5	.574	

INTEGRATION		
Item	Loading factor	Cronbach's $\alpha$ / AVE / CR / H
25	.784	
27	.777	0.823 /
26	.756	0.529 /
24	.742	0.870 /
22	.716	0.878
21	0.568	

QUALITY: Administrative services		
Item	Loading factor	Cronbach's $\alpha$ / AVE / CR / H
42	.855	0.879 / 0.566 /
41	.750	0.794 / 0.824
39	.636	