

Uncovering Alumni Perspectives: A Cluster Analysis of University Satisfaction

By Paloma Martinez - Hague¹, Milos Lau² Andres Macarachvili³ & Geraldine Caldas⁴

Introduction and Aim

Universities are realizing the fundamental role their alumni have in their current and future sustainability, competitiveness, growth, and development, transforming them into one of their primary stakeholders and promoting the need to build solid and lasting relationships with them. To meet these challenges, universities are applying relationship marketing as a strategic response and considering students and alumni as consumers of a higher education experience (Cervera et al., 2011; de Macedo Bergamo et al., 2012; Iskhakova et al., 2017; Pedro et al., 2021; Schlesinger et al., 2012; Snijders et al., 2019).

Even though universities recognize alumni as strategic stakeholders, authors recognize the lack of research on the topic, specifically on their loyalty towards the university (Benites, 2021; Dalangin, 2021; Doña Toledo & Luque Martínez, 2020; Schlesinger et al., 2021; Cervera et al., 2011). Nevertheless, loyalty is one of the most relevant variables in relationship marketing because it is highly related to generating benefits for the organization; it impacts positive attitudes toward what the organization offers. Even more, a loyal consumer tends to maintain a close relationship with the organization, preferring it and recommending it as well, which is what universities seek with their alumni (Heffernan et al., 2018; Kotler & Keller, 2016; Schlesinger et al., 2014; 2017).

In this regard, previous studies have shown the significant influence that the perception of satisfaction has on loyalty toward the university (Doña Toledo & Luque Martínez, 2020; Eurico et al., 2015; Helgesen & Nettet, 2007; Martinez-Hague et al., 2022; Hague et al., 2022). Therefore, satisfaction becomes a crucial variable for this relationship, so this research seeks to deepen the study of this variable within the Graduate-University

¹ Associate Professor, School of Management, Pontifical Catholic University of Peru, pmartinezh@pucp.pe

² Assistant Professor, School of Management, Pontifical Catholic University of Peru, mlau@pucp.edu.pe

³ Assistant Professor, School of Management, Pontifical Catholic University of Peru, andres.macarachvili@pucp.edu.pe

⁴ Teaching Assistant, School of Management, Pontifical Catholic University of Peru, geraldine.caldas@pucp.edu.pe

Identification Model proposed by Schlesinger et al. (2015; 2014; 2012). Its objective is to identify groups of Alumni, taking into account not only dimensions of a demographic nature, such as the graduation group, gender, or age, but also the perception of satisfaction during the experience of the Alumni concerning their university. The study used a quantitative approach, the two-step cluster analysis technique, on a sample of 333 Alumni of the School of Management of the Pontificia Universidad Católica del Perú. The variables researched are sex, specialty, current employment status, and the measurement of the perception of satisfaction used by Schlesinger et al. (2015; 2014; 2012) measured using a scale of three items.

Theoretical Model

Within the relationship marketing paradigm, Schlesinger et al. (2015; 2014; 2012) researched to propose a model that measures and best describes the alumni-university relationship based on the "Quality of the student-professor interaction," "Alumni satisfaction with their university," "Identification between the Alumni and the university," "Loyalty," and "Image of the university" (Girard & Pinar, 2020; Kotler & Keller, 2016; Schlesinger et al., 2014; 2012; Schlesinger et al., 2021; Vargo & Lusch, 2004). The model and variables basis for this study is presented.

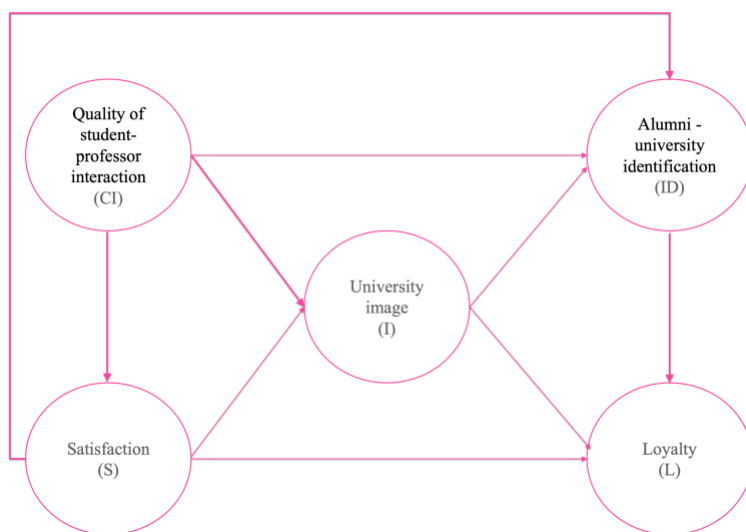


Figure 1: Theoretical model of the University-Alumni relationship

- Quality of student-professor interaction

Studies highlight the significance of analyzing the quality of interaction, emphasizing its importance in complex, personalized services that involve multiple transactions, such as education; this interaction is a fundamental element when analyzing and evaluating the quality of the experience (Crosby et al., 1990; Girard & Pinar, 2020; Kotler & Keller, 2016; Vargo & Lusch, 2004). For example, this interaction is a critical component in determining the quality of the education experience and includes extended encounters, provision of extras, and special attention to students. In addition, the quality of the relationship between professors and students is more important than the functional aspects of teaching, as it can create complicity and intimacy, leading to a more valuable learning experience (Chung & McLearn, 2000; Schlesinger et al., 2015).

- Alumni - university identification

Identification is a concept that has been widely studied in the organizational literature, particularly in relationship marketing. It refers to the perception of belonging or unity that individuals have with an organization, and it is based on self-perception of connection and closeness (Ashforth & Mael, 1989; Bergami & Bagozzi, 2000). Bhattacharya and Sen (2003) and Scott and Lane (2000) propose defining this relationship as voluntary, active, and selective, based on shared values and principles, and aimed at satisfying personal needs for self-definition.

- University image

The concept of image is multifaceted and is commonly defined in the literature as a collection of meanings stored in memory or a representation of beliefs, attitudes, and impressions held by an individual or group towards an object. It is not a passive construct but rather one that is actively created by the audience based on their interpretation of information and misinformation about the organization (Kazoleas et al., 2001; Reynolds & Gutman, 2001). The notion of image refers to how a brand or organization is perceived by its target audience or market. Therefore, image is a topic of great interest in research related to brand value (Aaker, 1991; Faircloth et al., 2001; Keller, 1993; Mourad et al., 2006; Syed Alwi & Kitchen, 2014). The image of an educational institution is essential since it heavily relies on the perception of

its consumers, as it actively shapes the institution's brand image (Mourad et al., 2020; Pinar et al., 2020; Syed Alwi & Kitchen, 2014). To construct an accurate image, it is necessary to consider both the cognitive and affective aspects of the experience by the specific audience (Bielefeld, 2009; Schlesinger et al., 2014; Syed Alwi & Kitchen, 2014).

- Loyalty

In relationship marketing, loyalty is a crucial variable that directly correlates with generating organizational benefits. Organizations strive to create loyal customers due to the positive attitudes they generate, leading to future purchases and recommendations. A loyal customer maintains a close relationship with the organization and prefers and recommends it (Kotler & Keller, 2016; Heffernan et al., 2018; Oliver, 1999; Schlesinger et al., 2014). In alumni management, loyalty starts when the individual is a student and continues after graduation, highlighting the importance of managing the relationship with graduates and the mutual benefits it creates (Doña Toledo & Luque Martínez, 2020; Helgesen & Nettet, 2007; Schlesinger et al., 2017).

- Satisfaction

Satisfaction has a close link to the expectations generated beforehand. It is a subjective and emotional evaluation of the experience that considers the value delivered concerning the value expected. Satisfaction levels can be distinguished as an experience can meet or exceed the expectations set; the latter will lead to a higher level of satisfaction that will have long-term impacts on variables like loyalty, image, and identification with the organization (Gallarza & Saura, 2006; Kotler & Keller, 2016; Schlesinger et al., 2014). Graduates evaluate their satisfaction based on their expectations as applicants and overall university experience (Doña Toledo & Luque Martínez, 2020; Schlesinger et al., 2021; Schlesinger et al., 2014). Even more, according to some authors, satisfaction is a condition that must be evaluated after consuming a service experience (Mano & Oliver, 1993; Westbrook & Oliver, 1991). Finally, Pedro et al. (2018) associated satisfaction with antecedents like loyalty, word-of-mouth, reliability, and willingness to continue participating in university activities. It is worth noting that, according to Schlesinger et al.'s model (2014; 2015; 2012), satisfaction is also affected by evaluating the quality of the interaction between students and teachers.

Research Methodology

The approach was quantitative, to recognize patterns within a sizable dataset and execute analyses involving correlation and clustering. The study applied a structured questionnaire (Schlesinger et al., 2015; 2014; 2012) to 333 Alumni members from the School of Management of the PUCP, a private associative university based in Metropolitan Lima. The School of Management was founded in 2004 and welcomed its first students in 2005, so the first graduating class was in 2009. As of December 2021, it has 2,683 Alumni.

Under the quantitative approach, we applied the two-step cluster analysis technique. The advantage of using the two-step cluster in this study is the possibility of using both qualitative and quantitative variables (Rundle-Thiele et al., 2015). These variables are sex, specialty, current employment status, and the measurement of the perception of satisfaction used by Schlesinger et al. (2015; 2014; 2012) using a scale of three items.

The nonparametric test utilized to explore the relationship between the variables was Kruskal-Wallis. When variables had more than two categories, we conducted pairwise comparisons to determine the dominant category. In addition, cluster analysis was developed to categorize the Alumni based on their satisfaction level. Clustering is a technique that identifies natural groups within a dataset; it is an exploratory approach that helps reduce a large number of observations into smaller groups based on their similarities (Schiopu, 2010; Van Delft, 2013).

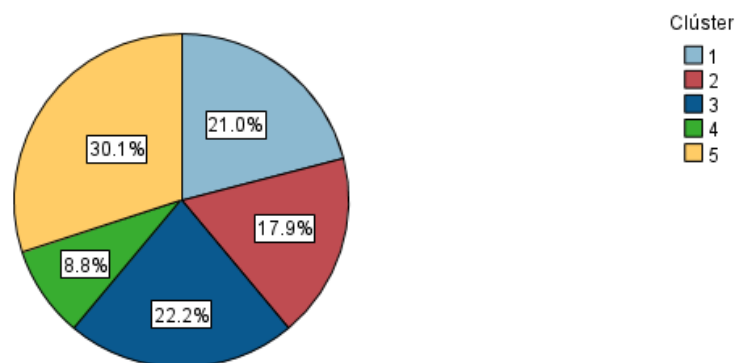
As suggested by the literature (Rundle-Thiele et al., 2015), several reliability measures were considered. First, there was a careful analysis of which variables to include in the process, namely those with the highest relative importance for the cluster formation. The quality of clusters was verified through the silhouette measure of cohesion and separation, whereby values above 0.00 indicate that the within-cluster distance and the between-cluster distance are valid; in other words, values above this level suggest that an observation belonging to a cluster have a low likelihood of belonging to another one. A viable number of clusters was also found to wit between 2 and 7. Regarding the characterization of clusters, avoiding specific names helped reduce interpretation bias. Lastly, additional correlations were conducted between the cluster membership variable and the involved variables (using chi-square tests for categorical variables and Kruskal-Wallis tests for interval ones). In the

case of variables with more than three categories (size and industry), they were first transformed into dichotomous ones and tested independently for correlations.

Results and Implications

We obtained five clusters with a good measure of cohesion, silhouette, and separation as a result of the application of the two-stage technique, using six variables: sex, specialty, current employment status, and the three items of the perception of satisfaction (Schlesinger et al., 2015; 2014; 2012). It means that the resulting clusters have a "good" separation between them and high cohesion within each one. In short, their quality ensures that there would be no overlap between the clusters.

The sample of 333 Alumni was distributed in total within the five clusters. It indicates that all the observations had complete information regarding the variables used. Figure 2 presents the distribution of the observations within each cluster.



Smallest cluster size	29 (8.8%)
Largest cluster size	99 (30.1%)
Size ratio: from largest cluster to smallest cluster	3.41

Figure 2. Cluster sizes

Regarding the importance of the variables to generate the clusters, we found that the main one was the specialty, followed by current occupation, item S3: "In general, I am

satisfied to have studied at PUCP," gender, item S2: "The university has met my expectations" and, finally, item S1 "My decision to have studied at PUCP was the right one." This ordering of importance suggests that the profiles obtained are based mainly on two behavioral variables: specialty and current employment status and one perception variable of satisfaction. It is necessary to indicate that variables such as age and whether they are currently studying in a postgraduate program contributed negatively to the quality of the clusters. Moreover, that is why we decided not to include them.

Table 1 shows the composition of the sample within each cluster, according to each of the variables. It clearly shows that clusters 3 and 5 are made up entirely of Alumni from the business management specialty. On the other hand, only cluster 2 comprises Alumni from the public management and social management specialties, these two being the specialties that have historically had the fewest number of students within the School of Management and, therefore, of Alumni.

Regarding the clusters formed based on the levels of satisfaction obtained by the three items of the Schlesinger et al. (2015; 2014; 2012) model, a clear arithmetic difference can be observed between the average scores in cluster four and the rest of the clusters. In cluster 4, there are averages of 4.69 for S1, 4.31 for S2, and 4.69 for S3; on the other hand, in the rest of the clusters, the averages for these three items are above 7, within a scale that goes from 1 to 9.

In order to confirm this difference, we applied the Kruskal-Wallis test, which has as a null hypothesis that the clusters have an equal centrality behavior, while the alternative hypothesis indicates that at least one cluster has a different behavior from the rest in terms of the three satisfaction items. The results of the test showed that the null hypotheses should be rejected. Therefore, we proceeded to see which of the clusters had a different behavior.

For this reason, we then proceeded to make a paired sample of the clusters with each satisfaction item. As a result, we obtained that the centrality measure of cluster 4 differs from the rest of the clusters in the three satisfaction items. In summary, the behavior is statistically different and lower in cluster 4.

Table 1. Clusters

Cluster	1	2	3	4	5
Size	21.0% (69)	17.9% (59)	22.2% (73)	8.8% (29)	30.1% (99)
Entries	Business management specialty 94.2%	Public management specialty 62.7%	Business management specialty 100%	Business management specialty 79.3%	Business management specialty 100%
	Current occupation: Study and work 87%	Current occupation: Work 79.7%	Current occupation: Work 100%	Current occupation: Work 69%	Current occupation: Work 100%
	In general, I am satisfied to have studied at PUCP 7.99	In general, I am satisfied to have studied at PUCP 8.31	In general, I am satisfied to have studied at PUCP 7.85	In general, I am satisfied to have studied at PUCP 4.69	In general, I am satisfied to have studied at PUCP 8.29
	Gender: Male 58%	Gender: Female 74.6%	Gender: Male 100%	Gender: Female 79.3%	Gender: Female 100%
	The university has met my expectations 7.52	The university has met my expectations 7.78	The university has met my expectations 7.38	The university has met my expectations 4.31	The university has met my expectations 7.78
	My decision to have studied at PUCP was the right one 7.57	My decision to have studied at PUCP was the right one 8.14	My decision to have studied at PUCP was the right one 7.95	My decision to have studied at PUCP was the right one 4.69	My decision to have studied at PUCP was the right one 8.23

Finally, it is interesting to mention that an arithmetic difference was found in the averages of the items related to institutional loyalty between cluster 4 and the rest. This could suggest that the segment with the least satisfaction is more likely to have less institutional loyalty upon graduation.

Table 2. Average satisfaction items of the Schlesinger et al. (2015; 2014; 2012) model according to each cluster.

Cluster	If you had to take other courses, studies, you would consider the university as your first option	If someone asks you for advice, you would recommend the university	If the opportunity arose, you would comment positive things about the university with your family and friends	You would encourage others to study at the university
1	5.90	7.51	7.81	7.67
2	6.64	8.05	8.14	7.93
3	6.11	7.58	7.77	7.79
4	3.59	4.21	5.00	4.10
5	6.67	8.14	8.44	8.28

Conclusions

In general, clusters 1, 2, 3, and 5 reveal good levels of satisfaction towards the university and the School of Management; this is positive. However, data indicates that cluster 4 is the segment of Alumni with the least satisfaction, showing essential differences with the other clusters. Even though it is the smallest cluster, the low levels of satisfaction are worrisome. This cluster is composed of Alumni who, at the time of the survey, were not working or studying. Therefore, it is suggested to deepen the relationship of these variables through qualitative techniques.

The cluster analysis identified specialty as the primary variable. It is interesting to note that even though there is a significant difference in the number of students and Alumni between the three specialties: business, public and social management, mainly 80%, 10%, and 10%, respectively, a cluster was formed with public and social management Alumni. This, too, should be researched further with qualitative techniques.

Two of the studied variables were irrelevant to the study; these were age and whether they were currently studying. However, future research could include analyzing the graduation group to understand if this variable impacts the clusters identified.

Even though, in previous studies, gender was identified as relevant regarding differences in perceptions of the Alumni - University relationship (Hague et al., 2022), for this cluster analysis, it was not a relevant variable, as seen in Table 1. However, these differences could be further explored in future research.

Table 2 shows a similar behavior from cluster 4 regarding loyalty towards the university, hinting that lower levels of satisfaction are associated with lower levels of loyalty. This relation should be studied with the same variables to understand their relationship.

As can be seen, the field of study we have explored offers a rich opportunity for further research, as it has not yet been extensively investigated. In addition, there is still much to learn about the relationship between Alumni and universities and how to enhance this connection based on students' experiences.

One of the limitations of our study is that we have only examined this model in a one-degree program, specifically management in a particular university with distinct characteristics such as being private and having a more than a century-old foundation. Therefore, future research should broaden the scope by investigating public and private universities in Peru and other joint degrees, such as law, engineering, and medicine.

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Appendix 1. Variables and measurement scales of the model

Variables	Scales
Quality of student-professor interaction	CI2 The professors showed interest in giving more than just the academic
	CI3 They established a good relationship with the students
	CI4 There was a close relationship with the students
Satisfaction	S1 Your decision to have selected it was correct
	S2 Has satisfied your expectations
	S3 In general you are satisfied
Image	Or2 It is a university oriented and concerned about its students
	Or3 It has good professors
	Or4 It is close to society
	Or5 Provides good education
	Or6 Close to companies
	Or7 Provides hands-on training
	Or8 Is very demanding
	R 2 They have a good reputation
	R 3 It is a modern university
	R 4 It has good facilities
	R 6 It is an innovative university
	Acc1 It is easy to enter to study in it
	Acc2 It is accessible to all people
	est-af1 Is nice
	Est-ff2 Is cheerful
est-ff3 Is young	
Identification Alumni-University	ID1 When someone criticizes the university you take it as an insult
	ID2 You are interested in what people think of the university
	ID3 When you talk about the university you usually say "we"
	ID4 When the university succeeds, you feel like it's your success
	ID5 When someone praises the university you take it as a compliment
	ID6 It bothers you that some news from a media outlet criticizes the university
Loyalty	L2 If you had to take other courses, studies, you would consider the university as your first

	option
	L3 If someone asks you for advice, you would recommend the university
	L4 If the opportunity arose, you would comment positive things about the university with your family and friends
	L5 You would encourage others to study at the university