Identifying patterns of alumni commitment in key strategic relationship programmes

Abstract

Higher education institutions (HEIs) need to understand their alumni when drawing strategic relationship programmes. This paper aims to identify clusters of alumni based on their commitment relationship and to analyse factors influencing their intention to collaborate with the HEI. The study took place at a Portuguese university, considering a dataset of 1075 of alumni asserting intention to collaborate. First, a cluster analysis was conducted to identify patterns of commitment relationship. Secondly, a logistic regression was run to identify determinants of intention to collaborate. Both techniques revealed the decisive role of HEI commitment in the process. Relationship advantages and positive feelings towards the HEI were also pointed out as important. Alumni asserted recommendations, further training, sharing experiences and giving help as ways to collaborate with HEI. Regression results suggest that sociodemographic variables such as gender, marital status and volunteering are significantly associated with a probability to collaborate. Results also show that affiliation in sororities/fraternities and participation in extracurricular activities are significantly associated with that collaborative intention. The findings provide clues to support strategic relationship programmes based on consistent marketing campaigns, while bringing value to the literature in the European context, where alumni culture requires real insights to evolve.

Keywords: Relationship marketing; HEI; alumni; commitment-relationship; clustering; binomial logit

Introduction

The alumni–alma mater relationship represents a challenging paradigm for higher education institutions (HEIs), particularly in the European context where alumni culture is now taking its first steps (Pérez-Esparrells & Torre, 2012; Snijders, Wijnia, Rikers, & Loyens, 2019). HEIs have already realised what this long-term relationship represents and that a deeper understanding of their alumni is critical for its success.

Under the scope of relationship marketing, initiatives have been developed to enhance relationships to meet the expectations of alumni, but when HEIs face scarce resources and tight budgets, which is the case of the majority of Portuguese HEIs, effective clustering strategies are needed to achieve successful measures (Durango-Cohen & Balasubramanian, 2015; Le Blanc & Rucks, 2009). Clustering thus allows optimisation of resources and greater effectiveness of activities such as solicitation and communication campaigns. Moreover, leads to a better understanding of alumni characteristics, and once they have been gathered into similar groups, those campaigns can be tailored accordingly (Durango-Cohen & Balasubramanian, 2015; Le Blanc & Rucks, 2009; Rattanamethawong, Sinthupinyo, & Chandrachai, 2018). Furthermore, complementing these advantages with the knowledge of what predicts prospective alumni intending to collaborate in the HEIs' activities, an important contribute to better define strategies is achieved (Clotfelter, 2001).

Against this background, the purpose of this study is to determine clusters of alumni who declare intention to collaborate with the alma mater's activities, reinforcing this information with the identification of predictors of that intention, in order to better targeting alumni when drawing marketing campaigns. This study intends to make an empirical contribution to the topics of alumni clustering and identification of determinants of their intention to collaborate in the Portuguese context, given the scant number of existing studies in Portugal and also in other European countries (Pedro et al., 2020). Moreover, from a managerial perspective, this paper also intends to provide findings that give HEI valuable clues to support communication strategies with alumni, to strengthen relationships and to encourage alumni engagement in the alma mater's life.

Given that the primary goal of relationship marketing is to build and maintain a committed customer base (Grönroos, 1994), commitment is a strong determinant for relationship quality, which leads to successful relational exchanges (Morgan & Hunt, 1994). However, commitment is a complex construct thereby requiring a deep

understanding of its nature (Sargeant & Woodliffe, 2005), namely identifying its drivers. A set of items influencing future alumni' commitment towards the HEI, may emerge during their academic experience, as well as through features related to sociodemographic (e.g. Belfield & Beney, 2000; Clotfelter, 2001; Lara & Johnson, 2014; Skari, 2013; Stephenson & Bell, 2014).

Immediately after graduation is a stage that may represent a break in the relationship between alumni and the HEI, or on the contrary, a desire to remain attached to the HEI may emerge through, for example, willingly engaging in HEI activities, sharing their experiences with current students, recommending the HEI, participating in fundraising campaigns and choosing the HEI for further training, among other possibilities (Alnawas & Phillips, 2015; Hennig-Thurau et al., 2001; Morgan & Hunt, 1994; Sargeant & Woodliffe, 2005; Weerts & Ronca, 2007). These behavioural intentions to sustain the relationship encompass the commitment-relationship dimension, and it makes sense to cluster alumni according to their perception about this dimension, which leads to this study's first research question (RQ):

RQ 1. How many commitment-relationship based clusters are in the HEI?

The other two RQs are likely legitimated concerning cluster characterisation, bearing in mind that the ultimate objective is to get an accurate understanding of the alumni who assert an intention to collaborate with HEI:

RQ 2. What are the main attributes distinguishing alumni clusters?

RQ 3. What are the main characteristics of each cluster?

If clustering offers advantages to define strategies, we believe that, identifying the predictors of the intention to collaborate gives an important complement to that definition, which raises the following RQs:

RQ 4. Do commitment, academic experience and sociodemographic variables predict the intention to collaborate with the HEI?

RQ 5. How do these variables influence the intention to collaborate with the HEI?

Considering, this study concerns a context in which alumni culture is still weak, we believe that it adds value to the literature highlighting strategies under the scope of relationship marketing aiming to reinforce alumni- alma mater commitment relationships. Aspects like clustering and definition of the profile of the alumni who are willing to collaborate provide HEIs' administrators key information to define effective strategies.

Since, the resources required in communication campaigns are always an issue, every help to minimise them is very welcome.

Theoretical background

The higher education market is a field of fierce competition in which permanent changes and challenges require renewed and keen strategies to keep HEIs on the rail. In the European context, problems such as demographic decline, budgetary constraints, internationalisation and pressure caused by rankings have forced HEIs to be proactive and reinvent themselves. As a consequence, a shift in higher education management is taking place, replacing traditional and inefficient forms of academic management with new practices based on criteria of rationality and efficiency common in the private sector (Mainardes, Raposo, & Alves, 2014; Pérez-Esparrells & Torre, 2012; Santiago, Carvalho, Amaral, & Meek, 2006; Schlesinger, Cervera, & Iniesta, 2015). Portuguese HEIs are following this trend, and although in a slower way when compared with HEIs in other European countries, progress has been noticed for some measures involving institutional stakeholders framed by a clear market orientation (Alves, Mainardes, & Raposo, 2010; Helgesen, 2008).

Relationship marketing has guided policies towards HEI stakeholders, especially when students and alumni are concerned. Initiatives have been developed to enhance relationships to meet the expectations of these stakeholders to reinforce competitiveness in a context where above-mentioned problems are particularly sharp (Alves & Raposo, 2007; Santiago et al., 2006). HEIs are aware of the benefits resulting from long-term relationships with their alumni (Helgesen & Nesset, 2007; Hennig-Thurau Langer & Hansen, 2001; Schlesinger, Cervera, & Pérez-Cabañero, 2016), and an alumni orientation (Alnawas & Phillips, 2015) perspective is growing within management and expressed in a growing set of activities to engage alumni and gain their participation.

The literature regarding alumni commitment to a long-term relationship points out different sorts of features permitting alumni characterisation, especially those systematising demographic and academic issues. Clotfelter (2001) refers to, among many other aspects, social and economic characteristics, academic preparation, state of residence, gender, household income, political philosophy, legacy status and extracurricular activities. Lara and Johnson (2014) add other items like varsity, honours

received, Greek activities, relatives who have attended the same HEI and marital status, while Wunnava and Lauze (2001) include activity in volunteer programmes and courses. To achieve a deeper understanding of the different identified cohorts and define predictive models of commitment, three more dimensions of commitment are worthy of consideration regarding previous research's results.

As Hennig-Thurau et al. (2001) assert, affective commitment is of major importance in traditional educational research on student loyalty. Iskhakova, Hilbert and Hoffmann (2016) also emphasise the influence of affective commitment in alumni loyalty. Affective commitment reflects a psychological attachment to the partner (Geyskens, SteeKamp, Scheer, & Kumar, 1996), and has a key role in the development of customer relationship loyalty (Amani, 2015). According to Fullerton (2003), understanding the nature of the commitment present in the relationship is important for perceiving the role of the customer's commitment and, Morgan and Hunt (1994) add, that commitment reflects an identification and attachment to the organisation, allowing the conclusion that affective commitment is a consistent basis to sustain differentiation between individuals.

Cognitive commitment likewise plays a key role in understanding the nature of commitment relationship, as it is related to the perceptions of the likely advantages and benefits resulting from the relationship (Fullerton, 2003; Geyskens et al., 1996; Hennig-Thurau et al., 2001; Sargeant & Woodliffe, 2005). Alumni may be motivated to be involved when they perceive its intangible advantages (Alnawas & Phillips, 2015).

HEI's commitment is important in assessing the relationship, because it expresses the responsibility and responsiveness of the HEI in the process (Alnawas & Phillips, 2015; Holdford & White, 1997), which in turn may influence alumni commitment, particularly if the HEI stresses two-way communications and asks for collaboration (Rattanamethawong, et al., 2018). If alumni are aware of the HEI's needs, they are more likely to make efforts to help (Alnawas & Phillips, 2015; Bekkers & Wiepking, 2007).

Finally, there is a set of variables based upon either academic experience and sociodemographic issues that facilitate group characterisation and may establish patterns of alumni commitment. Both dimensions stress predictive variables such as, for academic experience, honours received, involvement in extra curricular activities, sororities or fraternities, degree of satisfaction in alumni's undergraduate experience, number of years in institution, degree and course, or, among sociodemographic characteristics, age, gender, residence, household income, job position, number and age of children, marital status and volunteer activities (Belfield & Beney, 2000; Clotfelter, 2001; Lara & Johnson,

2014; Skari, 2013; Stephenson & Bell, 2014; Wunnava & Lauze, 2001).

Determinants of success referring to alma mater commitment-relationship depend on both the efficacy of the above-mentioned characterisation and effective marketing campaigns, and especially on the communication and solicitations concerned. Knowing *whom to ask for what* is of paramount importance, as it brings twofold advantages: first, a profile of the committed alumni is provided, and second, it permits identification of the predictable variables of effective commitment that certainly contribute to sustain the institutional leaders' decisions. Studies such as those by Belfield and Beney (2000), Clotfelter (2001, 2003), Nesbit and Gazley (2012) and Weerts and Ronca (2007, 2008) have shed light on this matter by stressing the predictive elements for giving. All of the effort to structure the methods, means and timing of how solicitations are delivered may influence the results of the campaigns (Baade & Sundberg, 1996; Belfield & Beney, 2000; Hunter, Jones, & Boger, 1999).

Methodology

Research context

This study is part of a broader investigation, that took place at a young Portuguese university, motivated by the need to find consistent tools to develop better long-term relationships with alumni, as it has taken on the responsibility of fostering an alumni culture for a community of about 32000 individuals. Recently some initiatives concerning alumni involvement were developed, but these revealed an urgent need to overcome constraints caused by a lack of integrated policies toward alumni engagement. Understanding alumni is a good starting point, as in the Portuguese higher educational context key information about alumni is still limited. Concerns about the identification of stakeholders and their correspondent needs and expectations are present in relationship strategies, so the definition of integrated measures is necessary to sustain competitiveness (Alves, Mainardes, & Raposo, 2010; Alves & Raposo, 2007; Schlesinger et al., 2015).

Data and instrument development

The above-mentioned investigation started with a qualitative research, through three focus groups conducted in December 2017 and January 2018, having the main goal to understand alumni's perceptions about determinants of the commitment relationship with the alma-mater. The research findings of this study together with a literature review

supported a quantitative study that proposed a theoretical model explaining alumni-alma mater commitment relationship. All constructs included in the model were validated in that study (Pedro et al., 2020). Data were collected through an online survey questionnaire applied to a sampling frame of undergraduate alumni who graduated between 1987 and 2015 - three years before the data collection. This survey took place between November 2018 and February 2019. Out of a population of 23823 alumni, only 12078 survey invitations were delivered to recipients due to lack of information about contact emails, and of these 357 emails were undeliverable. In total, 2008 alumni participated in the survey, achieving a response rate of 17%.

The survey was designed to capture alumni's perceptions on the following dimensions: academic experience, current situation, HEI commitment, affective commitment, cognitive commitment and commitment relationship. The questionnaire included a set of questions to collect information related to sociodemographic features, which are essential for drawing the alumni profile, as well as information about the alumni participation in groups or associations (sororities/fraternities) during their time as students. It also included questions to assess their giving behaviours, namely their intention to participate in fundraising campaigns, and if they usually participated in volunteering activities. Finally, the survey instrument also measured their intention to collaborate with HEI's initiatives, as this variable is important for clustering and regression analysis. Information supplied by the HEI's academic services was also added to the final dataset.

For the measurement of the variables mentioned above, an eight-point Likert scale defined by the extremes 1=Strongly disagree and 8=Strongly was chosen. The use of an even number of points aimed to avoid the tendency of mid-scale (neutral) answers, since these answers can have a significant influence in the results. The choice of eight points is justified by both the higher education level of respondents and the concern to attach a quantitative metric to the measurement scale, to assure the adjustment and robustness of the results derived by sophisticated statistical techniques (Malhotra, Birks, & Wills, 2012, p. 427-428).

Research strategy and data analysis

Since a main objective of this study is to conduct a cluster analysis based on commitment, as a way to identify alumni who are more willing to collaborate with the HEI (1075 assert their intention to collaborate), it was decided to consider this group for clustering in order

to gain insight into further developments. Considering above mentioned objective, the cluster analysis was based on commitment-relationship indicators of the following dimensions: HEI commitment, affective commitment, cognitive commitment and commitment relationship. Table 1 presents the variables of these dimensions, as well as other variables related with the alumni academic experience and sociodemographic characteristics used to profile the clusters. The last two groups of variables were also used in the logistic regression model.

Table 1 Variables used in the cluster analysis

Dimensions	Components	References
Commitment relationship (CR)	(CR1) HEI chosen for future training (CR2) HEI recommended to family and friends (CR3) Desire to share experience with current students (CR4) Desire to provide help in through HEI activities (CR5) Desire to participate in fundraising campaigns (Cr6) Desire to participate in alumni meetings	e.g. Alnawas and Phillips (2015), Geyskens et al. (1996), Hennig-Thurau et al. (2001), Morgan and Hunt (1994), Sargeant and Woodliffe (2005)
Affective commitment (AC)	(AC1) A sense of belonging to the HEI (AC2) Pride in having been a student of the HEI (AC3) Feeling part of the HEI's success; (AC4) Compliments to the HEI equated with personal compliments (AC5) Criticism of the HEI produce embarrassment (AC6) Perception of the HEI as a trusted institution (AC7) HEI's logo brings pleasure	e.g. Adidam, Prasad & Sindhav (2004); Fullerton (2003), Holdford and White (1997), Hennig-Thurau et al. (2001), Snijders et al. (2019), Stephenson and Bell (2014), Wong and Wong (2011)
Cognitive commitment (CC)	(CC1) Advantages of collaboration with the HEI (CC2) Practical aspects of relationship with the HEI	e.g. Fullerton (2003), Geyskens et al. (1996), Sargeant and Woodliffe (2005)
HEI's Commitment (HC)	(HC1) HEI requests alumni collaboration whenever necessary (HC2) HEI maintains active communication with alumni (HC3) HEI guarantees proper methods used to gather alumni's opinion (HC4) HEI ensures the quality of its services (HC5) HEI concerned about alumni	e.g. Baade and Sundberg (1996), Belfield and Beney (2000), Hunter, Jones, & Boger (1999); Jiewanto, Laurens and Nelloh (2012); Rattanamethawong, et al., (2018); Rojas-Méndez,Vasquez-Parraga, Kara and Cerda-Urrutia (2009)
Academic experience (AE)	(AE1) Affiliation in student groups and/or sororities/fraternities (AE2) Active participation in extracurricular activities	e.g. Ashforth and Mael (1989), Baade and Sundberg (1996), Hennig-Thurau et al. (2001), Lara and Johnson (2014),

	(AE3) Year of graduation	McAlexander and Koenig (2001),
	(AE4) Scientific area of the course	Wunnava and Lauze (2001)
Sociodemographic	Age; gender; place of residence; place of work; number of children; marital status; volunteer activities; fundraising	Belfield andBeney (2000), Clotfelter (2001), Lara and Johnson (2014) ; Monks (2003); Skari, 2013; Weerts and Ronca (2008) Wunnava and Lauze (2001)

In order to reach that aim, a clustering process was applied to generate and select the number of clusters. A hierarchical cluster analysis was applied to capture the similarities between alumni given the set of commitment-relationship variables, using the squared Euclidean distance as a similarity measure. The following algorithms were used: average linkage, complete linkage and ward. Results of these three algorithms were analysed and compared to choose an adequate number of clusters, which was then determined considering the R-square statistic and analysis of the dendrograms. A solution of five clusters was chosen, because the centroids of the clusters were significantly different and the R-square indicated a total variability of 0.546 for this solution. The profile of each cluster was created by cross-tabulating the clusters' membership variable with three sets of variables: sociodemographic, commitment and academic experience-related variables. We tested for differences between the clusters, regarding these sets of variables using both the Chi-square test and one-way ANOVA (followed by the Games–Howell post-hoc test).

Afterwards, a binary logistic model was run to estimate determinants of the intention to collaborate with the HEI. Intention to collaborate was the dependent variable, coded as 1 for "Yes" and 0 for "No". Independent variables regarding commitment were chosen from among the ones that revealed the highest scores in the clusters: AC1, AC2, AC6, HC1, HC2, HC3, HC4 and CC1. Dummy variables were used for multinomial variables, taking a value 1 when the alumnus belonged to the named category, and 0 otherwise. Table 2 displays the remaining independent academic experience and sociodemographic variables used in the regression model. To this analysis, the variable year of graduation was recalculated to time since graduation.

Table 2 Variables used in the logistic regression model

Variable	Description	Parameter coding
Intention to collaborate	Dependent variable	No=0, Yes=1
Sororities/fraternities	Affiliation in student groups and/or sororities/fraternities	No=0, Yes=1
Time since graduation	Number of years after graduation	2019-year of graduation (scale)
Extracurricular	Participation in extracurricular activities	1-8 (scale)
Age	Age	Scale
Gender	Gender	Female=0 , Male=1
Place of residence	Distance between the place of residence and the HEI	< 100 kms=0, ≥100 Kms=1, abroad=2
Place of work	Distance between the place of work and tthe HEI	< 100 kms=0, ≥100 Kms=1, abroad=2
Children	Number of children	Scale
Marital status	Marital status	Single=0 , Married= 1 , Other=2
Volunteering	Usually does volunteer work	No=0, Yes=1

All statistical analysis were performed using the IBM SPSS version 25.

Results and discussion

Summary of findings

Cluster analysis findings

The cluster analysis generated five clusters based on commitment-relationship. Each cluster was labelled regarding the levels of the four dimensions of commitment used in their characterisation compared with the overall means of these dimensions in the group (Table 3).

Table 3 ANOVA and Games-Howell test results of differences between clusters

	Total n=1075 (100%)	Cluster 1 n=485 45.1%	Cluster 2 n=250 23.3%	Cluster 3 n=133 12.4%	Cluster 4 n=126 11.7%	Cluster 5 n= 81 7.5%	One-way ANOVA F (p-value)	Games-Howell test results
		Enthusiastic	Shy but curious	Awake committed	Sheepish committed	Need a little push group		
CR	**6.09**	**7.20**	**5.66**	**5.68**	**4.05**	**4.59**		
CR1	6.30	7.16	5.78	6.63	3.43	6.70	272.27 (0.000)	3=5
CR2	6.73	7.43	6.24	6.92	4.70	6.88	172.83 (0.000)	3=5
CR3	6.28	7.40	5.63	6.74	4.79	3.19	413.45 (0.000)	
CR4	6.24	7.37	5.57	6.22	4.67	4.06	313.84 (0.000)	4=5
CR5	5.38	6.88	5.22	3.72	3.06	3.22	386.32 (0.000)	5=4,3
CR6	5.60	6.99	5.51	3.86	3.67	3.47	354.41 (0.000)	4=3,5; 3=5
AC	**6.46**	**7.10**	**6.09**	**6.46**	**4.79**	**6.15**		
AC1	6.54	7.19	6.10	6.68	4.89	6.42	79.78 (0.000)	2=3,5
AC2	6.86	7.49	6.44	6.90	5.24	6.86	98.34 (0.000)	2=3,5; 3=5
AC3	6.56	7.28	6.14	6.50	4.89	6.21	77.74 (0.000)	2=3,5; 3=5

	Total	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Chi (p-value)	Games-Howell
AC4	6.27	7.05	5.92	6.10	4.45	5.77	74.90 (0.000)	2=3,5; 3=5
AC5	5.65	6.36	5.42	5.44	4.06	4.86	45.43 (0.000)	5=2,3,4
AC6	6.67	7.24	6.30	6.83	5.10	6.59	90.26 (0.000)	2=3,5
AC7	6.68	7.35	6.34	6.75	4.89	6.36	97.21 (0.000)	2=3,5
CC	**5.52**	**6.11**	**5.96**	**5.67**	**4.33**	**4.96**		
CC1	5.90	6.62	5.35	6.12	4.42	5.21	52.69 (0.000)	5=2,3,4
CC2	5.13	5.60	4.78	5.21	4.23	4.72	18.04 (0.000)	3=1,2,5
HC	**6.86**	**7.44**	**6.40**	**6.86**	**5.90**	**6.32**		
HC1	6.84	7.52	6.22	6.84	5.83	6.16	83.40 (0.000)	4=2,5; 5=2,3
HC2	6.87	7.54	6.34	6.99	5.72	6.11	97.44 (0.000)	5=2,4
HC3	7.05	7.62	6.61	7.01	6.18	6.49	74.84 (0.000)	2=3,5; 5=3
HC4	7.47	7.78	7.10	7.52	6.97	7.47	39.95 (0.000)	5=2,3,4
HC5	6.09	6.76	5.75	5.92	4.81	5.37	45.21 (0.000)	5=2,3,4
AE1	**4.68**	5.21	4.68	4.26	4.05	3.17	19.91 (0.000)	4=2,3,5; 2=3
Children	**0.75**	0.81	0.78	0.81	0.44	0.70	4.63 (0.001)	ns

Note: Games-Howell results represent the non-statistically significant cases. All the remaining cases are statistically significant

Table 4 Chi-squared tests results of differences between clusters

	Total n=1075 (100%)	Cluster 1 n=485 45.1%	Cluster 2 n=250 23.3%	Cluster 3 n=133 12.4%	Cluster 4 n=126 11.7%	Cluster 5 n= 81 7.5%	Chi square (p-value)
		Enthusiastic	Shy but curious	Awake committed	Sheepish committed	Need a little push group	*p-value (0.000)
Gender							39.860*
Female	59.6	59.2	58.0	54.9	57.9	77.8	
Male	40.4	40.8	42.0	45.1	42.1	22.2	
Age group							17.225*
20-25	3.7	3.9	2.4	3.0	4.8	6.2	
26-30	20.3	17.9	18.0	17.3	32.5	27.2	
31-35	19.7	19.6	20.4	20.3	24.6	9.9	
36-40	23.7	25.6	24.4	24.8	14.3	23.5	
41-45	17.1	16.3	22.0	17.3	9.5	18.5	
46-55	13.1	14.0	10.8	16.5	13.5	8.6	
≥56	2.3	2.7	2.0	0.8	0.8	6.2	
Marital status							1036.570*
Single	42.0	38.1	42.0	43.6	51.6	48.1	
Married	51.6	54.8	49.6	51.9	45.2	48.1	
Other	6.3	7.0	8.4	4.5	3.2	3.7	
Place of residence							194.012*
< 100 kms	68.4	71.8	66.4	69.2	54.0	75.3	
≥ 100 kms	22.2	19.6	26.4	19.5	28.6	19.8	
Abroad	9.4	8.7	7.2	11.3	17.5	4.9	
Place of work							178.020*
< 100 kms	67.2	70.7	66.0	64.7	53.2	75.3	
≥ 100 kms	22.8	20.0	25.6	23.3	29.4	19.8	
Abroad	10.0	9.3	8.4	12.0	17.5	4.9	
Year of graduation							966.938*
1987-1995	4.0	4.3	2.8	3.0	6.4	3.7	
1996-2000	7.6	8.2	8.0	6.0	6.3	7.4	
2001-2005	18.4	18.8	23.6	14.3	12.7	16.0	

2006-2010	33.7	32.6	35.6	36.1	29.4	37.0	
2011-2015	36.3	36.1	30.0	40.6	45.2	35.8	
Scientific area of the course*							265.422*
HST	11.0	10.1	10.8	11.3	13.5	12.3	
EMT	32.7	35.1	36.0	28.6	23.8	29.6	
ET	16.4	15.3	19.2	17.3	15.1	14.8	
ENS	11.6	9.7	9.2	16.5	18.3	12.3	
SES	20.6	21.9	16.0	19.5	21.4	27.2	
ACH	7.7	8.0	8.8	6.8	7.9	3.7	
Sororities/fraternities							
Yes	37.9	41.6	37.6	33.1	39.7	21.0	
No	62.1	58.4	62.4	66.9	60.3	79.0	
Volunteering							16.455*
Yes	43.8	50.1	38.4	36.1	42.1	38.3	
No	56.2	49.9	61.6	63.9	57.9	61.7	
Fundraising							296.953*
Yes	76.3	87.0	85.2	55.6	53.2	54.3	
No	23.7	13.0	14.8	44.4	46.8	55.7	

Note: *HST: health sciences and technologies; EMT: economy, management and tourism; ET: engineering and technologies; ENS: exact and natural sciences; SES: social and education sciences; ACH: arts, communication and heritage.

The overall findings show good levels of commitment when compared with the mean values of the four dimensions, which can be explained by the fact that clustering was conducted within the group willing to collaborate. Table 3 shows the profile of the five alumni clusters. There are significant differences between clusters given by the results of one-way ANOVA and Games–Howell post-hoc tests, when applied to the items of the commitment dimensions and the remaining quantitative variables (AE1 and number of children). The same can be concluded according to Table 4, which contains the Chi-squared tests results for the sociodemographic and remaining qualitative variables.
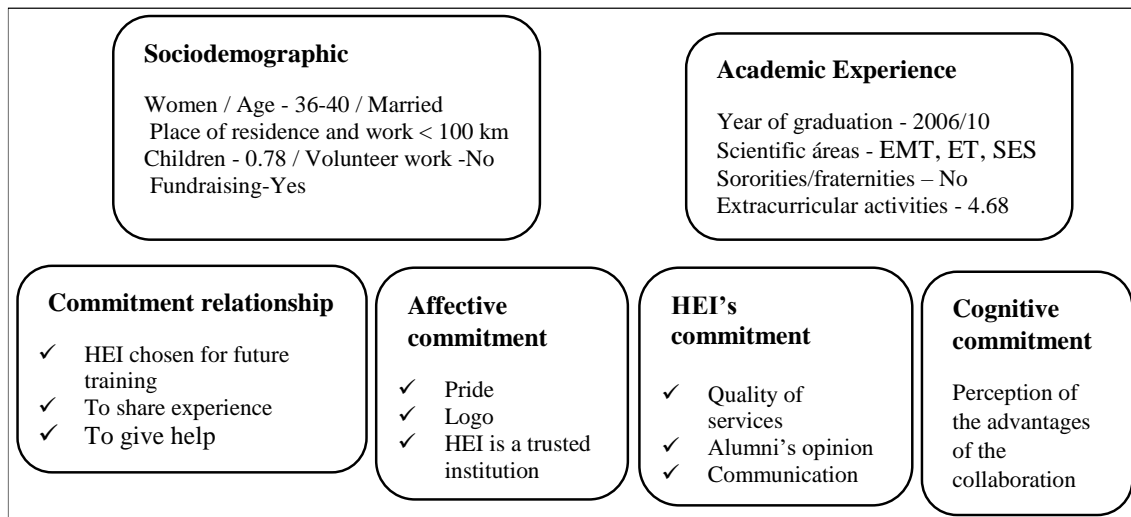
Based on the clustering results, the HEI is given a clear overview of the willingness of their alumni to commit with it and possible strategies regarding features of each cluster. Although Tables 3 and 4 give an overview of the five clusters, a summary is given in from Figure 1 to 5, where the variables with the highest mean values are presented. Across the five clusters some variables revealed very similar values, namely the ones related with sociodemographic aspects (e.g. gender, marital status, number of children, and place of work/residence). Likewise, variables encompassing academic experience present some similarities, especially "sororities/fraternities" where the category "No" presents the highest percentage for all the clusters. Finally, results concerning cognitive commitment also showed that the perception of the advantages of the relationship with the HEI is the most valued item for all clusters.
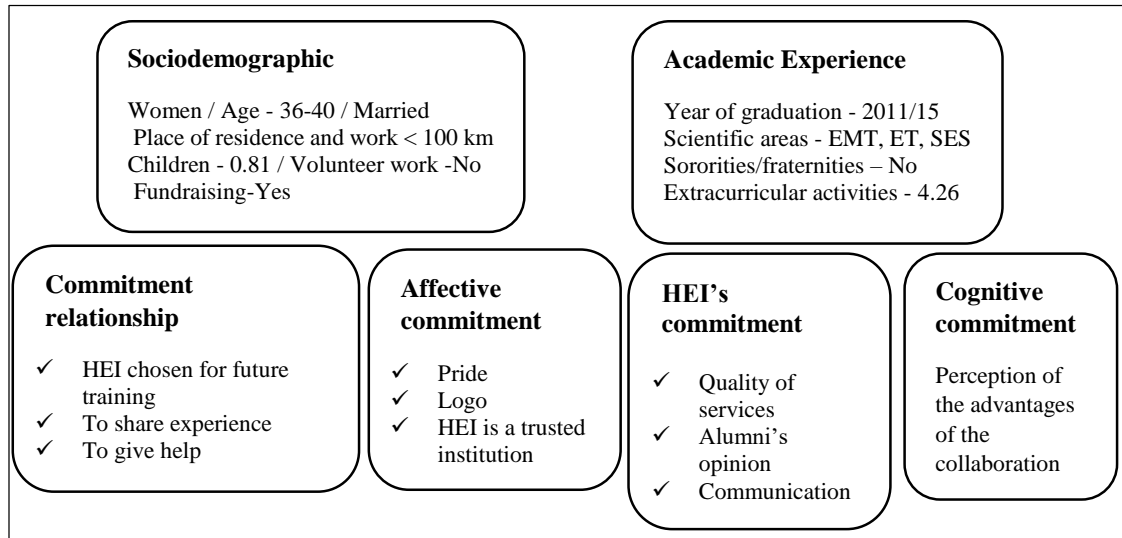
Figure 1. *The Enthusiastic*

Sociodemographic	Academic Experience
Women / Age - 36-40 / Married Place of residence and work < 100 km Children - 0.81 / Volunteer work -Yes Fundraising-Yes	Year of graduation - 2011/15 Scientific areas - EMT, SES, ET Sororities/fraternities – No Extracurricular activities - 5.21

Commitment relationship	Affective commitment	HEI's commitment	Cognitive commitment
✓ To recommend the institution ✓ To share experience ✓ To give help	✓ Pride ✓ Logo ✓ Feeling part of HEI's success	✓ Quality of services ✓ Alumni's opinion ✓ Solicitations	Perception of the advantages of the collaboration

Cluster 1 is the biggest (45.1%) and the most outstanding group concerning commitment, so it was labelled "Enthusiastic". Members of this group are particularly concerned with HEI's commitment especially on measures referring to quality of services, the HEI, gathering their opinion and soliciting. They stress to feel proud in having been a student of the HEI, and feel that they contributed to HEI's success. Likely, seeing the HEI's logo gives them positive feelings. In terms of collaboration, alumni of this group assert that they recommend the institution, share their experience and give help whenever needed. It is important to notice that 87% of the members declared the intention to collaborate in fundraising campaigns and half of them usually does volunteer work. On giving back, the HEI can count on both monetary and intangibles. This cluster is probably the one that gathers the most appropriate characteristics to respond assertively to the different calls of the institution. It can be a good partner to mobilize alumni most unlikely to collaborate.
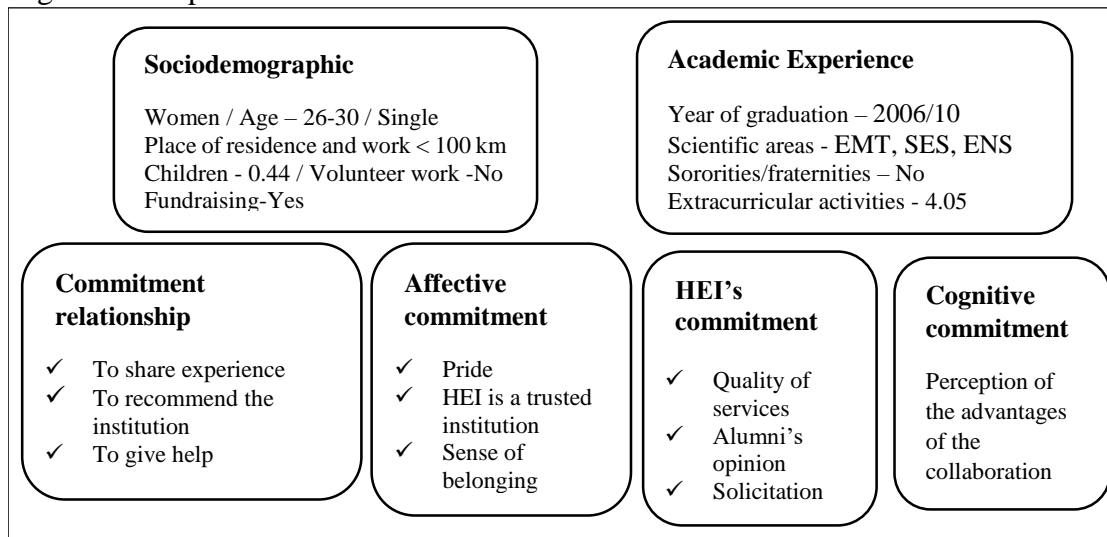
Figure 2 *Shy but curious*

Sociodemographic	Academic Experience
Women / Age - 36-40 / Married Place of residence and work < 100 km Children - 0.78 / Volunteer work -No Fundraising-Yes	Year of graduation - 2006/10 Scientific áreas - EMT, ET, SES Sororities/fraternities – No Extracurricular activities - 4.68

Commitment relationship	Affective commitment	HEI's commitment	Cognitive commitment
✓ HEI chosen for future training ✓ To share experience ✓ To give help	✓ Pride ✓ Logo ✓ HEI is a trusted institution	✓ Quality of services ✓ Alumni's opinion ✓ Communication	Perception of the advantages of the collaboration

Cluster 2 is the second largest group (23.3%) and presents medium overall levels of commitment, with a greater stress on the perception about HEI's commitment. Like cluster 1, services quality and alumni's opinion present the highest mean scores, but they also recognize the communication as important. They also express pride in having been a student and the logo, but it seems that trust on the institution is equally significant. Regarding commitment relationship, this cluster stresses their willingness to recommend the institution, engage in further training and share their experiences. This cluster also presents a significant percentage of alumni asserting the willingness to participate in fundraising campaigns (85.2%) and, due to this value and according to their perception about overall commitment dimensions, this group was labelled "shy but curious". It offers significant results regarding willingness to give back though it is a smaller group when compared to cluster 1. Both clusters, complement each other and depending on the HEIs needs, solicitations would certainly have positive answers when targeting both.

Figure 3 *Awake commited*

Sociodemographic	Academic Experience
Women / Age - 36-40 / Married Place of residence and work < 100 km Children - 0.81 / Volunteer work -No Fundraising-Yes	Year of graduation - 2011/15 Scientific areas - EMT, ET, SES Sororities/fraternities – No Extracurricular activities - 4.26

Commitment relationship	Affective commitment	HEI's commitment	Cognitive commitment
✓ HEI chosen for future training ✓ To share experience ✓ To give help	✓ Pride ✓ Logo ✓ HEI is a trusted institution	✓ Quality of services ✓ Alumni's opinion ✓ Communication	Perception of the advantages of the collaboration

Cluster 3 represents 12.4% of respondents and is a group that presents the second-best levels in all commitment dimensions, suggesting "awake committed" for the group's title. It also presents significant mean levels concerning HEI's commitment. Affective commitment also presents the same mean value as the total group (6.46), underlining once again pride as the highest mean value. Intention to give back is embodied specially by choosing the HEI for future training. Together with cluster 2, may constitute an interesting target when delivering information about postgraduate courses, as both stress their will to choose the HEI for future training.

Figure 4 Sheepish *committed*

Sociodemographic	Academic Experience
Women / Age – 26-30 / Single Place of residence and work < 100 km Children - 0.44 / Volunteer work -No Fundraising-Yes	Year of graduation – 2006/10 Scientific areas - EMT, SES, ENS Sororities/fraternities – No Extracurricular activities - 4.05

Commitment relationship	Affective commitment	HEI's commitment	Cognitive commitment
✓ To share experience ✓ To recommend the institution ✓ To give help	✓ Pride ✓ HEI is a trusted institution ✓ Sense of belonging	✓ Quality of services ✓ Alumni's opinion ✓ Solicitation	Perception of the advantages of the collaboration

Individuals of cluster 4 present the lowest mean scores for commitment, but stressed balanced mean scores related to positive feelings towards the HEI, which suggested a label of "sheepish committed". This cluster represents 11.7% of the alumni, and HEI's commitment maintains the tendency of the highest mean value. Affective commitment

appears with second highest mean value. Concerning commitment relationship, sharing experiences presents the highest value, followed by recommending. This is mostly a group of young single women. This group presents the highest number of alumni living and working abroad (17.5%), followed by cluster 3 (11.3%) which constitutes an interesting aspect if campaigns to gather ambassadors abroad are thought.

Figure 5 *Need a little push group*
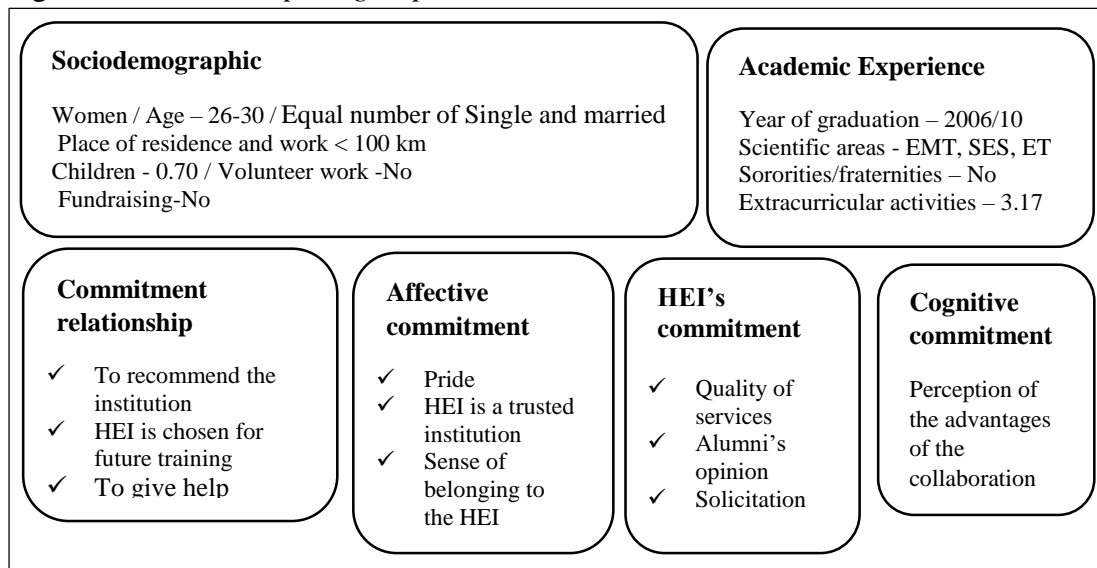
Cluster 5 represents a small group (7.5%), with interesting levels of commitment, leading to the label "need a little push group". For this group, HEIS' commitment plays an important role, with a mean value of 6.32. Regarding affective commitment pride and trust appear with the two highest mean values. In terms of commitment relationship, collaboration is given through recommending, further training and help. This is a predominantly female group (77.8%), in the age range of 26–30 (27.2%) and 36–45 (42.0%), and with the same percentage of single and married (48.1%). Clusters 4 and 5, are particularly challenging due to their dimension, commitment mean levels and some features regarding sociodemographic factors. Campaigns targeting these clusters may be well succeeded if they are drawn taking into consideration elements of affective commitment as they are quite similar for both clusters. Furthermore, messages must be very clear and honest, stressing the value of their aid.

Noteworthy to mentioned is that although the similarities between each cluster's features, it is evident that clusters complement each other, particularly regarding information given by commitment dimensions, crucial to define strategies. The responsibility of the HEI in the commitment relationship is underlined. Alumni expect that the HEI ensures the overall quality of its services and maintains communication with

them particularly by guaranteeing proper methods of gathering their opinions. In a perspective of relationship marketing, these findings confirm the value of quality and communication in terms of engage alumni as stated for example by Rattanamethawong et al. (2018).

It is also important to note that affective commitment represents the second most valued dimension for all clusters, as such giving a clear insight to the HEI regarding promoting relationships with students and alumni. Positive feelings expressed in "pride in having been a student of the HEI" and "perception of the HEI as a trusted institution", demonstrate strong reasons to maintain the relationships with HEI in line with the related literature (e.g. Adidam, et al., 2004; Hennig-Thurau et al., 2001; Holdford & White, 1997; Snijders et al., 2019; Wong & Wong, 2011).

Concerning cognitive commitment, findings stress the perception of the advantages that alumni may get from the relationship, which is extremely valorised in all clusters with a slight difference in cluster 4, where mean values were slightly lower, but in line with the values of the other dimensions. We believe that these values can be explained by different characteristics of this cluster, namely the fact that majority of its members are between 26 and 35 years old, single, recently graduated (2011-2015) and a considerable number of them is living and working abroad (17.5%), which meets findings as, for example, Belfield and Beney (2000), Lara and Johnson (2014) and Weerts and Ronca (2007).

Divergences among the five clusters are mainly identified through commitment relationship. "HEI recommended to family and friends" (CR2) is common to all of them, but for higher average values, there is a similarity between "HEI chosen for future training" (CR1), "to share experience" (CR3) and "to give help" (CR4). Information given by the remaining variables is equally valid regarding the needs and strategies of the HEI, which is in line with the literature, asserting the importance of knowing how alumni intend to be involved with the HEI (e.g. Alnawas & Phillips, 2015; Hennig-Thurau et al., 2001; McAlexander & Koenig, 2001; Sargeant & Woodliffe, 2005).

Concerning academic experience and sociodemographic characteristics, notwithstanding general convergences between clusters at first sight, each cluster presents specific features. As to academic experience, the findings suggest that clusters 3 and 4 present, on average, a shorter period since graduation (9.77 and 9.99 years). The other groups present a period between 10.10 and 10.78 years. In terms of subjects of study areas, there is a noteworthy concentration in economy, management and tourism

in every cluster, but certain uniform distributions of the areas between the five clusters are visible. Concerning affiliation with sororities/fraternities, the rates show most alumni were not affiliated, which is particularly underlined in clusters 3 and 5. Equally relevant, when explaining the intention to collaborate, is the involvement in extracurricular activities (AE1), because the findings show higher averages in clusters 1, 2 and 3.

Noteworthy are the relatively balanced figures between clusters in terms of gender – except for cluster 5 – and of marital status – except for cluster 4. The age average is between 36.99 and 37.72, except for cluster 4, which is 35.13. Cluster 4 is the youngest cohort, with more single people, fewer children and a higher percentage of alumni living and working abroad. It also presents the lowest rate of commitment, which is in line with the conclusions of Lara and Johnson (2013), Weerts and Ronca (2007, 2008) and Wunnava and Lauze (2001) who asserted that intention to give/collaborate increases with age, volunteerism habits, marriage, and living near the HEI. A certain sense of independence seems to influence the willingness to collaborate.

Analysing the binary logistic regression model

The logistic regression model used to identify determinants of the intention to collaborate with the HEI was estimated on the dataset of 2008 alumni, revealing a model with 11 predictors of collaboration. The results presented in Table 5 show that the null hypothesis of the test of overall model significance (Lagrange multiplier test) is rejected ($p<0.01$), but the null hypothesis of the Hosmer–Lemeshow test is not rejected ($p>0.10$), which shows that the fitted model is correct. Both pseudo-R² measures indicate a satisfactory model quality.

Table 5. Determinants of intention to collaborate (logistic regression)

	Coefficient	Standard Error	*p*-value	Exp(coefficient)
(AE1) Sororities/fraternities	-0.509***	0.132	<0.001	0.601
(AE2) Extracurricular	0.053**	0.026	0.040	1.054
(AE3) Time since graduation	-0.003	0.011	0.823	0.997
(CC1) Advantages	0.043	0.030	0.154	1.044
(AC1) Sense of belonging	0.214***	0.050	<0.001	1.238
(AC2) Pride	-0.066	0.062	0.289	0.936
(AC6) Trust	-0.039	0.053	0.460	0.962
(HC1) Request collaboration	0.244***	0.054	<0.001	1.276
(HC2) Communication	0.234***	0.065	<0.001	1.264
(HC3) Opinion	0.168**	0.065	0.010	1.184
(HC4) Quality	-0.200***	0.064	0.002	0.819
Age	0.003	0.008	0.730	1003
Children	-0.081	0.078	0.301	0.922

Male	-0.242**	0.111	0.030	0.785
Volunteering	-0.857***	0.116	<0.001	0.424
Place of residence			0.650	
≥ 100 kms	0.784	0.934	0.401	2.191
Abroad	0.630	0.957	0.510	1.877
Place of work			0.490	
≥ 100 kms	-0.547	0.920	0.552	0.579
Abroad	-0.857	0.942	0.363	0.425
Marital status			0.073	
Married	-0.498*	0.268	0.063	0.608
Other	-0.567**	0.249	0.023	0.567
Constant	-3.439***	0.584	<0.001	0.032

Test	χ^2	df	p value
Score test (LM test)	584.584	21	<0.001
Hosmer and Lemeshow test	3.755	8	0.879
Cox and Snell R^2=0.253		Nagelkerke's R^2=0 .337	

Note: * p-value<0.10; ** p-value<0.05; *** p-value<0.01

After testing, an improvement in the model was noteworthy, and the constant-only model predicted collaboration intention of 53.5%, the predictor model presented a rate of 72.1% and a good model adjustment can be concluded according to the area under the ROC curve (AUC) presenting 0.796 as shown in Table 6, with a sensitivity of 78.0% and a specificity of 65.3% for a cut value of 0.50. In general, an AUC of 0.5 suggests no discrimination (i.e., ability to predict alumni with and without intention to collaborate), 0.7 to 0.8 is considered acceptable (Hosmer & Lemeshow, 2000, pp. 160-164).

Table 6. Classification table (n=2008)

Observed		Predicted Intention to collaborate		
		No	Yes	% correct
Intention to	No	609	324	65.3
collaborate	Yes	237	838	78.0
Overall percentage				72.1
Area under the Roc curve	0.796			

Analysing Table 5, the results partially meet the authors' expectations regarding dimensions in the model as predictors of collaboration. In terms of commitment there is a strong influence of HEI's commitment over intention to collaborate, through all of its variables included in the model. Alumni assert that the HEI should ask for their collaboration, because the results show that when there is a one-unit increase in this variable increases the probability of collaboration by 27.6% (*odds ratio* of 1.276), which is supported by the litereature (e.g. Belfield & Beney, 2000; Skari, 2013). The logistic model indicates that the intention to collaborate is 26.4% more likely when there is a one-unit increment change in the perception of communication (between 1 and 8) and is 18.4% more likely when that increment happens in the perception about the HEI's developing

means to gather their opinion. This is supported in the related literature (e.g. Alnawas & Phillips, 2015; Baade & Sundberg, 1996; Belfield & Beney, 2000). In terms of the HEI's concerns about overall quality perception, a peculiar contradiction seems to appear, since a one-unit increase in this variable decreases the odds of collaboration by 18.1%, that is, intention to collaborate is 0.819 times as likely with a one unit increase in the quality perception (e.g. from 1 to 2, or 2 to 3). The literature usually presents overall quality as a relevant atribute influencing behavioral intentions (e.g. Alves & Raposo, 2007; Baade & Sundberg, 1996; Hennig-Thurau et al., 2001; Snijders et al., 2019), but there is a slight parallel between our results and those of Jiewanto et al. (2012), who found that service quality had a negative impact on word-of-mouth intention, as well as with the conclusions of Rojas-Méndez et al. (2009), who assert that service quality does not directly influence student loyalty. We think that an explanation for that may be the alumni's intention to contribute to overall success of the HEI, namely helping to improve services quality. Notice that they assert HEI's task to request their collaboration.

Affective commitment predicts intention to collaborate through the sense of belonging, since an increase of one unit in this variable means that the intention to collaborate increases by a multiplicative factor of 1.238 (23.8% more likely). Indeed, strong positive feelings are predictive of alumni engagement, which is supported in the literature (e.g. Fullerton, 2003; Hennig-Thurau et al., 2001; Holdford & White, 1997). Cognitive commitment is the exception in predicting collaboration, as it is statistically non-significant, in line with the conclusions of Hennig-Thurau et al. (2001). It seems that intention to collaborate does not depend on advantages or benefits that alumni could receive.

The literature recognises that involvement in extracurricular activities and affiliation in sororities/fraternities represents effective ways of building positive feelings, therefore leading to commitment (e.g. Hennig-Thurau et al., 2001; Lara & Johnson, 2014). Both variables are indeed statistically significant, so they are predictors of intention to collaborate. When the variable extracurricular participation increases by one unit, the odds of collaboration rises by 5.4%. However, regarding sororities/fraternities, alumni who were affiliated show an intention to collaborate 39.9% lower than those who were not (*odds ratio* of 0.601). Establishing a parallel with related literature we found some contraditory findings with the ones of Lara and Johnson (2014). These authors found that alumni who were active community members as students are not more likely to give, than those who weren't. Exception made to the ones who were members of

sororities/fraternities, as it was the opposite, alumni who were members are now more likely to give. Howsoever, we may conclude that engagement and involvement in activities as students do not necessarily mean future engaged alumni, leading to a reflection on the role of the university in cultivating a giving back culture.

In terms of sociodemographic variables, predictors are gender, marital status and volunteering. The results show that men are 21.5% less likely to collaborate than women, confirming the conclusions of Belfield and Beney (2000), Lara and Johnson (2014) and Weerts and Ronca (2007). In terms of marital status, single alumni are more collaborative than married or alumni in "other" marital situations, as the probability that those with these characteristics will collaborate are, respectively, 39.2% and 43.3% lower than single alumni, which contradicts the conclusions of Lara and Johnson (2014) and Monks (2003).

Finally, concerning volunteering, the intention to collaborate is 57.6% lower (*odds ratio* of 0.424) among those who assert that they usually do volunteer work than among those who usually do not volunteer, so this variable may not be connected with further engagement. These results differ from the conclusions of Hunter et al. (1999), Weerts and Ronca (2007) and Wunnava and Lauze (2001). This volunteer work is external to the HEI, and may compete with other needs of the institution. Alumni may feel they are not able to respond to other solicitations. Whatever the reason, communication strategies shall be carefully thought in order to make the needs of the HEI very clear.

As previously stated, the dimensions considered in the study were supported by the literature, and the authors expected them to influence the intention to collaborate. Model estimation showed that years after graduation is non-statistically significant, which does not agree with the conclusions of McAlexander and Koenig (2001) and Okunade and Berl (1997). Age, number of children, place of residence and work are non-statistically significant to predict intention to collaborate, which differs from the conclusions of studies such Lara and Johnson (2014) for place of residence and age, Okunade and Berl (1997) for children, Skari (2013) and Stephenson and Bell (2014) for age and Weerts and Ronca (2007) for residence. As such, it seems that potential constraints that could occur are not sufficient reason to deny collaboration. In short, alumni just want to give back what they once received. According to our results, we may conclude that beliefs, attachments and positive feelings towards the alma mater are far more relevant to explain intention to collaborate than sociodemographic dimensions. These findings are consistent with previous studies (Hunter et al., 1999; Monks, 2003) that assert satisfaction with the undergraduate experience is more significant to alumni giving than sociodemographic

variables and as Weerts and Ronca (2007) assert, alumni voluntary support appears as a response to benefits received.

Main conclusions

HEIs need to know their alumni if they want to maintain permanent and strong bonds with them. In this context, developments are being made pretty much everywhere, and this study aims to contribute to those developments.

Clusters of supportive alumni

The first strategy used in this study suggested five committed alumni clusters, answering RQ1. The identification of cluster features answers RQ2 and RQ3. As such, and in terms of attributes, HEI's commitment plays a key role regarding commitment dimensions. The responsibility of the HEI in the commitment relationship is underlined, namely ensuring the quality of its services and proper methods to gather alumni's opinions, maintaining active communications with alumni and requesting their collaboration whenever is necessary. Perceptions of affective commitment also express a significant meaning, thus positive feelings towards the HEI are underlined namely, the pride they have in having been one of its students, the sense of belonging, recognition of the HEI as a trusted institution and feeling their part of its success. Regarding cognitive commitment, it is expressed through the perception of the advantages resulting from the collaboration. Finally, concerning commitment relationship, clusters assert the desire to recommend the HEI, to share experience, to give help and choose de HEI for futures training. A generic view of these conclusions gives us the perception that alumni assert and accept their role as partners by clearly defining the responsibility of each part in the relationship. In a relationship marketing perspective, aspects such as quality, communication flow and trust are underlined as crucial to maintain commitment relationship.

Regarding sociodemographic and academic experience features, clusters are comprised namely by young alumni. The majority are 26 to 40 years old, which can be explained by the fact that the HEI is relatively young too. Alumni are mostly, women, married, with few children, and live and work less than 100 km from the HEI. Results

show that more than a half assert that they usually don't do volunteer work but confirm intention to participate in fundraising campaigns. The majority graduated between 2006 and 2015, participated in extracurricular activities but didn't affiliate in any sorority/fraternity. Although all the scientific areas were represented, most cluster members graduated in economy, management and tourism, social and education sciences, and engineering and technologies. The clustering results concerning sociodemographic features, do not give strong surprises, namely in terms of gender, age, number of children, place of work and residence, as they express the alumni population tendency. But, concerning information about volunteer work and intention to fundraising, results do not correspond to our previous expectations. We were expecting that alumni who assert intention to collaborate were usually enrolled in volunteer work and the intention to fundraising was not so underlined as in Portugal fundraising campaigns and, especially, campaigns targeting alumni are not common.

Modelling the intention to collaborate

The econometric results shed light on RQ4 and RQ5. The estimated logit model shows that 11 covariables are statistically significant, and in general, all of them meet our previous expectations. It is noteworthy that HEI's commitment is a strong predictor of intention to collaborate. The HEI's solicitations and its efforts to improve communication and its care about alumni's opinions, will certainly contribute to achieve significant alumni' contributions. This result sends a clear message - the relationship maintenance that the HEI must take on its responsibility. But it seems that alumni also recognize their responsibility in this process too, and a sense of pure altruism rises, because regarding the other commitment dimensions, affective and cognitive commitment, only the "sense of belonging" predicted intention to collaborate. Advantages or benefits resulting from the relationship are definitively not decisive.

In what concerns academic experience, results showed that "active participation in extracurricular activities" and "affiliation in sororities/fraternities" predicted intention to collaborate. However, surprisingly, the last covariable presented a negative coefficient, which reveals that this kind of involvement as a student does not necessary result in future engagement, but we believe that it may contribute to other attributes influencing commitment, namely the sense of belonging.

In terms of sociodemographic variables, the predictors are gender, marital status and volunteer work. Women are more likely to collaborate than men and married alumni or those with "other" marital status are less likely to collaborate than single alumni. The fact that they usually do volunteer work does not mean they have a higher probability to collaborate, because this factor presents a negative coefficient. Nevertheless, we believe that voluntary behaviour can be used if the messages sent to alumni are effective.

Implications and suggestions for further studies

From a managerial point of view, the combination of both strategies gives an overall characterisation of the alumni most likely to collaborate. Based on information given by the sociodemographic, academic experience and commitment dimensions, a suitable clustering of alumni database was achieved allowing the application of differentiated strategies.

The academic experience elements give practitioners useful information to define strategies towards students aiming to maintain further relationships, namely reinforcing and improving measures addressing extracurricular activities, due to its influence in building positive feelings and consequent willingness to be involved with the HEI. Commitment dimensions are likewise relevant in defining the alumni relationship with the alma mater. HEI commitment is underlined as crucial, so management must take responsibility in the process, assuring effective two-way communication with both students and alumni, and actively seeking their opinions and suggestions for helping the HEI's efforts to sustain continuous overall quality. The findings also show that the HEI should drive solicitations when alumni involvement is necessary, meaning that a focused message with a clear and sincere purpose will certainly receive an enthusiastic response. Such HEI accomplishments may reinforce affective commitment, enhancing trust in the institution and pride in being involved. This should guide communication and overall marketing strategies. Clustering also gives clues about the aspects in which alumni are most likely to collaborate, allowing the HEI to solicit the right things from the right people to enhance positive responses. The findings obtained in the binomial logit model complement the information for management, because the predictors of the intention to collaborate were identified. Defining the "committed" profile allows for better strategies and better targeting. Although, the "giving back" segment was assumed in this research as a way to give mostly intangibles, it was noteworthy that alumni perceived fundraising as a positive thing, which should guide measures for conducting fundraising campaigns.

The present results also develop the literature on this topic. To the best of our knowledge, this is the first study of this sort done in Portugal, and we believe that these findings begin to fill the research gap concerning alumni clustering in the European context and Portugal in particular. The findings stress the responsibility of the HEI in the commitment relationship and key information about elements of this responsibility is given concerning future initiatives. As such, adding contributes to literature specially underlying clues to develop alumni culture, important in European context and particularly in Portugal.

The present findings also reinforce the understanding of the determinants of commitment, especially regarding non-monetary collaboration, and present a set of predictors that may help other HEIs enhance commitment relationship with their alumni. Furthermore, findings concerning academic experience also reinforce the understanding of some aspects that may influence future relationships, thus contributing to literature. Allthough every HEI has its particular features, we do believe that findings of this research will shed light on HEIs in European context and particularly in Portugal. Moreover, scarce resources is an issue that most HEIS in Europe face, therefore clues given in this research, namely segmenting databases offers a good help for action.

This study also raises questions and limitations are identified, but suggestions to future developments are pointed out. It was undertaken in a relatively young and medium-sized public university. If the study had been conducted in an older and bigger institution, would the results be the same? Further research should be undertaken to compare different contexts. It should also be interesting to compare similar institutions from different countries.

This investigation was based on alumni opinions and perceptions about a set of dimensions. Given that their time as students generated determinants for the future relationship with the alma mater, what kind of conclusions could be achieved if the study, after the necessary adaptations, was applied to a dataset of students? Future research taking this strategy would be useful for relationship marketing domains in HEIs, and could be further enhanced if the same studies were later applied to the same individuals as alumni. The focus of the present study was on alumni who asserted intention to collaborate. The main reasons for the non-intention to collaborate should be investigated, as these would certainly clarify some of the daily constraints HEIs have to face.

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