Determinants for the Commitment Relationship Maintenance between Alumni and the Alma Mater

ABSTRACT. This study aims to find determinants for the commitment relationship between alumni and alma mater. Based on the literature, satisfaction and image are proposed as drivers of commitment. A survey applied to 2,544 alumni in a Portuguese university provides data analyzed through a structural equation modeling technique. The results present "image of education", "image of communication" and "satisfaction with social and academic environment" as determinants of the commitment relationship, which provide important clues for the marketers' decision-making process when developing activities geared towards alumni. This process should emphasize aspects relating to their willingness to give back, academic and relationship quality, and institutional values. Within the Higher Education market, this study underscores the need to maintain and reinforce the relationship with alumni, and contributes to the scarce Portuguese literature on alumni matters.

Keywords: higher education institutions, alumni, image, satisfaction, commitment, structural equation modeling.

Introduction

In this century, Portuguese higher education institutions (HEIs) have faced diverse and significant challenges caused by demographic, financial/economic and globalization factors, following examples of universities in other countries such as Germany, Australia, the United States of America, Ireland, and the United Kingdom, among many others (Daly, 2013; Duarte, Alves, & Raposo, 2010; Gallo, 2012; Maringe & Mourad, 2012; Martin, Moriuchi, Smith, Moeder, & Nichols, 2015; Newman & Petrosko, 2011). As a response to these challenges and in order to achieve a competitive advantage, HEIs are rethinking their management practices and adopting professional management structures on a more entrepreneurial basis (Alves, Mainardes, & Raposo, 2010). Marketing concepts are added to those management practices so that HEIs achieve a strong market position and reinforce their corporate image and reputation (Landrum, Turrisi, & Harless, 1999). The fact that the demand for their courses can no longer be taken for granted indeed pushes HEIs to a distinct way of looking at the higher education (HE) market. The research into HE choice, or consumer behavior in HE markets, has become a reality (Hemsley-Brown & Oplatka, 2006). HEIs are adopting new approaches towards their stakeholders, especially where students are concerned, in order to understand their needs and expectations (Alves et al., 2010; Hemsley-Brown & Oplatka, 2006; Elliot & Shin, 2002; Helgesen, 2008).

When devising and implementing their marketing strategies, HEIs put special focus on relationship marketing (RM) as it underpins a customer-driven culture (Martin et al., 2015; Oplatka & Hemsley-Brown, 2007). RM leads to a greater emphasis on the relationship with different stakeholders, particularly with students. From the very beginning of HEI choice and enrollment, and through different stages of their academic life, RM underlines the partnership to be secured with students, particularly after graduation. This ongoing relationship with alumni is possible and effective if HEIs understand the need to commit with them and how to do it. All marketing strategies must be understood and assumed by all the academic and non-academic staff. The role of the alumni in this relationship is reflected in different activities they embrace to support their alma mater. For the purposes of this research, the following activities are considered to be the components of commitment: ambassadors, personal recommendations, advocates, lifelong training, mentors and donors (Martin et al., 2015; McAlexander & Koenig, 2001; Newman & Petrosko, 2011; Weerts, Cabrera, & Sanford, 2010).

The main goal of this study is to understand what drives the alumni's voluntary assumption of these roles, which means addressing the need to find the determinants for the commitment

relationship maintenance between alumni and the alma mater. A large set of potential determinants appear as valid, but considering the literature review, satisfaction and image are two frequently mentioned antecedents of loyalty, word of mouth, reliability, willingness to continue their studies and participation in the institution's activities, among other things (Al-Alak, 2006; Brown & Mazzarol, 2008; Çetin, 2004; Elliott & Shin, 2002; Helgesen & Nesset, 2007; Rodrigues, 2012; Schlesinger, Cervera, & Pérez-Cabañero, 2016). Establishing a parallel with similar studies gives the research an advantage and brings enrichment to the literature. Both are relevant reasons to take these two variables into account in this research. In order to better identify both constructs, we have defined the following research questions:

RQ1- Which items of satisfaction are determinants for the maintenance of the commitment relationship?

RQ2- Which items of image are determinants for the maintenance of the commitment relationship?

Finally, the commitment itself needs to be clarified, leading to the third research question:

RQ3- Which items of commitment appear decisive for the relationship between the alumni and the alma mater?

Given that Portugal was strongly affected by an economic and financial crisis during the last decade, whose effects led to a reduction in demand for higher education and a reduction in universities' budgets, new and effective management strategies are required. Planning a strong marketing strategy has become fundamental for a successful development of both private and public universities. This marketing task requires an understanding of the new students' needs, wants, and preferences, as well as the determinants of the alumni-alma mater relationship.

Examples from other countries show the important role that alumni can play in this development and the consequent competitiveness gain in the HE market. Institutions in the USA and the UK have long held a solid alumni-alma mater relationship (Belfield & Beney, 2000; Brennan, Williams & Woodley, 2005; Clotfelter, 2003; Elliott & Healy, 2001), making them examples to be followed by other countries with a weaker or non-existent alumni culture, such as Portugal. Financial constraints have imposed new solutions as government policies towards the tertiary sector recommend new alternatives for funding (Alves & Raposo, 2007). To meet this target, marketers are looking for relevant information to support the development of effective RM strategies towards alumni. In order to address the relationship gap between the alumni and the alma mater in the Portuguese HE context, a descriptive marketing research study was conducted in a public university.

The subject of the research is a School of a Portuguese public university that struggles to compete among better positioned institutions. Although it is still a relatively young School, it already has an interesting number of alumni, who, in the few activities targeted towards them, have shown themselves to be committed to the School. This is therefore a good starting point for any alumni-alma mater relationship development.

In the HE market orientation context, this study provides an important set of information from which marketers may draw strategies concerning a very important group of HEI stakeholders: their alumni. It highlights satisfaction and image dimensions as determinants for the willingness of alumni to foster a closer relationship with the alma mater. It points out the need for maintaining and reinforcing the relationship with them, since alumni play significant roles in HEIs. The conclusions of the study are a good contribution to the relatively recent Portuguese literature on alumni matters.

The paper is organized as follows: section 2 presents the literature review, followed by hypotheses development; an in-depth presentation of the methodology is made in section 3; section 4 presents the results and a discussion of the findings; the conclusions and suggestions for further research are given in section 5.

Literature review

The HE sector all over the world is facing drastic changes. Particularly in Europe, HEIs are dealing with: (1) transformations in the global knowledge economy - engaging institutions to develop new research infrastructures, to assure effective knowledge sharing, and to deal with different cultures through the internationalization of higher education (European Commission, 2008; Helgesen & Nesset, 2007); (2) a very competitive HE market - which urges HEIs to provide high quality education, to provide accountability, and to reinforce image and reputation and consequent positioning (Çetin, 2004); and (3) the repercussions of the recession of 2008-2010 - strong cuts in public spending and consequent cuts in HEI budgets, along with severe reductions in student numbers (European Commission, 2011).

This last factor is extremely pronounced in Portuguese HEIs since education policies have been imposing the rationalization of the education supply, with the number of university places being fixed annually and simultaneously with a decrease in students at higher education age (Alves & Raposo, 2007). The figures of enrollment in the first decade of this century were favorable with an increase of 74%, but they reverted drastically, since by 2014 the decrease was 18%. Moreover, the birth rate decreased by 27.3% in Portugal between 1993 and 2013 (Pordata,

2016). Furthermore, the large HE network and the uncertainty brought by the Bologna Convention for the harmonization of academic degrees in the European Union have heightened the challenge (Duarte et al., 2010; Lopes, 2002). Portuguese HEIs are gradually overcoming a set of obstacles, namely the fact that government has given them autonomy to define their strategies but at the same time has demanded accountability in terms of quality and efficiency. Due to a decrease in public funding (in 2014 the public investment in higher education was less than 0.3% of the Gross Domestic Product [CRUP, 2014]), HEIs must find new funding sources, and thus make efforts to know and understand the expectations of all the stakeholders, with particular focus on their students and alumni, although the latter are receiving little attention from HEIs in general (Mainardes, Alves, Raposo, & Domingues, 2012). Furthermore, HEIs are facing a change in the pattern of demand and student profiles (Lopes, 2002; Mainardes et al., 2012).

Overcoming a latent resistance to change has become a major issue. HEIs are still included in a pure public service management (focused on dissemination of knowledge) with a traditional, rigid way of working that characterizes public institutions. Now, management features of a more commercial nature are being demanded, calling for more professional management structures and entrepreneurial types of organization (Mainardes et al., 2012). The different actors must realize the roles they play in these changes. The market orientation has to be accepted and understood by all the hierarchical levels of the institutions (Mainardes et al., 2012; Santiago, Carvalho, Amaral & Meek, 2006). As Hemsley-Brown and Oplatka (2006) state, the HE market is now a well-established global phenomenon, and gradually major English-speaking nations have adopted marketization and deregulation policies, followed by many countries all over the world. As a consequence, HEIs realize the value of marketing as a necessary tool to achieve a strong position in the market, by promoting a way of improving service, becoming more customer-oriented and reinforcing their image and reputation (Helgesen, 2008; Sung & Yang, 2008; Voon, 2008).

This customer orientation relies on RM concepts as it underlines the assumption of attracting, retaining and enhancing customer relationships (Oplatka & Hemsley-Brown, 2007). Students are HEIs´ main customers, so they become the main target of marketing strategies, aiming to meet their needs and expectations, since retaining matriculated students is as important as attracting or enrolling them (Kotler & Fox, 1994). Al-Alak (2006) concludes that committed student relationship leads to student satisfaction, loyalty, positive word of mouth and promotion, and consequently the continuity of this relationship. Relationship commitment

has to be fostered after graduation. HEIs have begun to understand its value, and are realizing the need to know the alumni motivations to keep connected (Al-Alak, 2006; Eliot & Healy, 2001; Helgesen, 2008; McAlexander & Koenig, 2001; Oplatka & Hemsley-Brown, 2007). A review of the literature reveals a wide array of resources that alumni can provide to their alma mater. They are HEIs' best ambassadors, advocates and volunteers. They can also be mentors, help to build enrolments, actively recommend the institution and be fundraisers (Fogg, 2008; Helgesen, 2008; McAlexander & Koenig, 2001; Sperlich & Spraul, 2007; Weerts et al., 2010).

The relationship commitment between alumni and the alma mater is a dual concept. We see it as a partnership. Firstly, a valuation of the alumni's role in the performance of this partnership must be carried out. The importance of alumni can be assessed in several ways: (1) as experienced partners, they can transmit feedback to the institution to define needed strategies; (2) as satisfied partners, they are the institution's best advertising channel; (3) as partners in the education activity, they value the quality and image of the institution for their own benefit and they actively contribute to the formation of that quality image; (4) they contribute financially to the institution, as a way of paying back what they received; and (5) they are employers of graduates and continue to be consumers of the education product.

On their side, in order to foster this partnership, HEIs develop relationship programs with the alumni, especially directing resources to motivate their involvement in the activities of the institution. HEIs are aware of the benefits of alumni's brand communities through initiatives to value university traditions, rituals and principles in order to strengthen engagement with the alma mater enhancing their sense of belonging, which increases their willingness to give back (Bernal & Mille, 2013; Gallo, 2012; Martin et al., 2015; Schlesinger, Cervera, & Iniesta, 2015; Weerts et al., 2010). Alnawas and Phillips (2015) present an approach of alumni orientation stressing the institutions' commitment in serving their alumni. Effective alumni management requires human resources and good tools. Alumni Relationship Programs (adapted Customer Relationship Programs) together with skilled professionals can be a good solution. However, to achieve success, the engagement of all academic staff upon alumni management must be assured. A continuous assessment of the outcomes is also a requirement in order to make necessary improvements (McAlexander & Koenig, 2001). In a RM perspective, this partnership between alumni and alma mater is based on commitment and trust. In fact, there must be confidence in an exchange partner's reliability and integrity, to assure the continuity of the relationship commitment as stated by Hennig-Thurau, Langer, and Hansen (2001) and Morgan and Hunt (1994).

According to Sargeant and Woodliffe (2005), marketing literature points out commitment as a relationship-enhancing state, and moreover they identify the construct in different ways: affective, normative and continuance. Affective refers to emotional attachment, identification and involvement with an organization, normative refers to the sense of obligation to be with it and continuance acknowledges the cost of leaving the organization. These dimensions challenge marketers to design different strategies targeting alumni's commitment, bearing in mind what materializes it. A critical task for HEIs is therefore the understanding of alumni's commitment drivers. This fact has been widely researched as the following studies, among many others, show: Alnawas and Phillips (2015); Bingham, Quigle and Murrray (2003); McAlexander, Kim and Roberts (2003). A conceptualization of commitment deriving from the literature embodies a set of important roles that arise from the continuity of their involvement which, for the purposes of this study, are defined as follows: participation in the institution's activities; interactions among the alumni through social activities; philanthropy; representation of the alma mater; volunteer work (Brown & Mazzarol, 2008; Fogg, 2008; Gallo, 2012; Helgesen, 2008; Hennig-Thurau et al., 2001; Nora & Cabrera, 1993; Weerts et al., 2010).

Hypothesis Development

Direct determinants of commitment

Satisfaction

The approach to this construct can be made considering two perspectives: (1) it is a process, as Oliver and DeSarbo (1988) explained in the *Expectancy disconfirmation paradigm.* This states that if services performance equals customers' expectations then satisfaction is achieved; (2) it is an emotion, a psychological state or a judgment that emerges from an evaluation of the performance of services as well as from their outcomes (Alves & Raposo, 2007; Hartman & Schmidt, 1995).

Student satisfaction is achieved when general quality and performance of the educational services meet or exceed their expectations (Browne, Kaldenberg, Browne, & Brown 1998; Duque, 2014; Elliott & Healy, 2001; Elliott & Shin, 2002; Lazibat, Bakovic & Duzevic, 2014; Shah, 2009). This way, the quality of academic life requires an effective measurement in order to get permanent improvements in the services offered (El-Hilali, Al-Jaber & Hussein, 2015; Pedro, Leitão & Alves, 2016). A satisfied student will be a loyal student and, after graduation, a loyal alumnus (Alves & Raposo, 2007; Helgesen & Nesset, 2007; Pedro et al., 2016). This is a very intricate issue, due to the complexity of the construct itself and the different roles

students may play in the educational process (Duarte et al., 2010; Litten, 1980). Nevertheless, student satisfaction must be analyzed considering all their experiences in the different dimensions identified in the literature, and so for the purposes of this research the following conceptions were adapted: (1) "satisfaction with education" - including matters such as quality of teaching, professional quality of teachers and pedagogical aspects in general (Browne et al*.,* 1998; Elliot & Shin, 2002; García-Aracil, 2008; Helgesen & Nesset, 2007); (2) "satisfaction with facilities and equipment" - comprising variables related to physical spaces and available equipment (Elliot & Healy, 2001; Elliot & Shin, 2002; García-Aracil, 2008; Helgesen & Nesset, 2007); (3) "satisfaction with services" - which concerns the evaluation of support services´ performance and availability (Cronin, Brady, & Hult, 2000; Elliott & Healy, 2001; Elliott & Shin, 2002; Hartman & Schmidt, 1995; Helgesen & Nesset, 2007; Marič, Pavlin, & Ferjan, 2010); (4) "satisfaction with social and academic environment" - which includes items related to the various relationships students may foster throughout their academic life, as well as evaluation of extracurricular activities that may influence these relationships (García-Aracil, 2008; Hartman & Schmidt, 1995; McAlexander & Koenig, 2001; Rodrigues, 2012). Dimension (1) has a particular emphasis on students as it assesses the interaction between them and teachers; it has a clear intrinsic concept of humanware (Brown & Mazzarol, 2008). The same can also be recognized in dimensions (3) and (4). Under the RM philosophy we want to test whether these dimensions are direct drivers of commitment. This leads to the following hypotheses:

H1: Satisfaction with education positively influences commitment.

H2: Satisfaction with services positively influences commitment.

H3: Satisfaction with social and academic environment positively influences commitment.

Image

Image appears frequently in the literature as an antecedent of satisfaction and loyalty (Alves & Raposo, 2007; Brown & Mazzarol, 2008; Helgesen & Nesset, 2007; Jiewanto, Laurens, & Nelloh, 2012; Schlesinger et al., 2016). Mazzarol and Soutar (1999) present the quality image as one of an institution's distinctive skills needed to achieve competitive advantage, but they also recognize the complexity of the image formation.

Belli, Goksel and Gürbüz (2015) claim that corporate image is a whole composed by visual, verbal and behavioral elements arising through a cognitive process, and Wilkins and Huisman

(2015) refer to the role of recommendation and sharing of experiences by friends and relatives as decisive by the formation of the image. Duarte et al. (2010) argue that image can be understood as a simplified combination of information related to an object, person, organization or place. These authors point out that we can recognize functional and cognitive influences in the institutional image formation. The former are related to tangible characteristics of the organization that are easily measurable. As for the cognitive, they depend on perceptions, so they concern the expression of feelings and attitudes towards the organization. Due to subjectivity, the preparation of institutional image is a complex issue and it is exacerbated if we take into account the multiplicity of judgments that different people make by different combinations of elements.

Image is a construct that encompasses different dimensions. In the present study, we consider the following dimensions and respective items: (1) "image of education" - comprising items that evaluate the students' perception of their course, study programs and academic performance (Browne et al., 1998; Duarte et al., 2010; Elliott & Shin, 2002; Hartman & Schmidt, 1995; Marič et al., 2010; Ivy, 2001); (2) "image of facilities and equipment" - which includes items related to physical characteristics of the institution, performance of the services and quality of the equipment (Browne et al., 1998; Elliott & Healy, 2001; García-Aracil, 2008; Helgesen & Nesset, 2007; Marič et al., 2010); (3) "image of communication" - containing items related to the interaction between the School and its environment (Alves & Raposo, 2007; Duarte et al., 2010; Helgesen & Nesset, 2007; Marič et al., 2010; Rodrigues, 2012). Dimensions (1) and (3) also have an intrinsic concept of humanware whereas dimension (2) has a tangible nature, thus we have assumed that image of education and facilities will not be directly related to commitment. Therefore, the following hypotheses are formulated:

H4: Image of education positively influences commitment.

H5: Image of communication positively influences commitment.


Indirect determinants of commitment

The information that indirect effects can provide allows the deepening of knowledge of how commitment is influenced by satisfaction and image and permits a better understanding of how these two constructs are related. In the literature, indirect effects have been given importance as the following studies testify: Helgesen and Nesset (2007) show the indirect effects of image over loyalty through satisfaction; Alves and Raposo (2007) also stress the indirect influence of

image and satisfaction over variables such as word-of-mouth and perceived quality; Cronin et al. (2000) stress the indirect effects of quality, value and satisfaction on behavioral intentions. Based on their findings, the following hypotheses were defined in order to check on indirect effects and how the diverse dimensions are related:

H6: Satisfaction with services positively influences satisfaction with education.

H7: Satisfaction with services positively influences satisfaction with social and academic environment.

H8: Satisfaction with the facilities/equipment positively influences satisfaction with services.

H9: Satisfaction with education positively influences the image of communication.

H10: Satisfaction with education positively influences the image of education.

H11: The image of communication positively influences the image of education.

H12: Satisfaction with social and academic environment positively influences satisfaction with education.

H13: The image of the facilities/equipment positively influences the image of the education.

The relationship between the dimensions of each of the constructs is embodied in the proposed conceptual model presented in Figure 1, whose factors and respective items are set out in Table 1.

Figure 1. Proposed theoretical model: Determinants for the commitment relationship maintenance
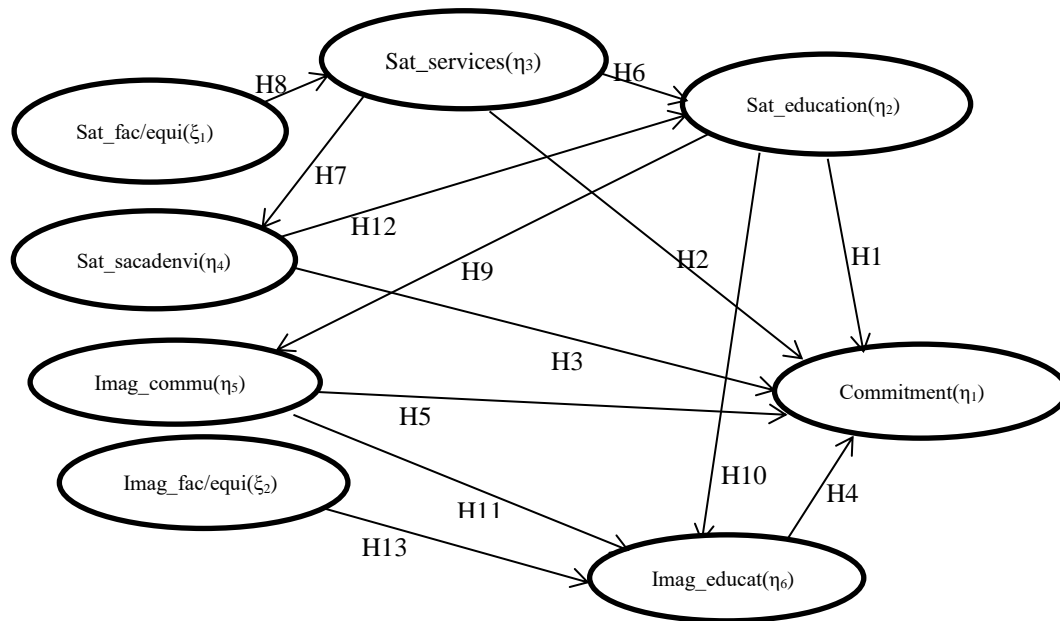
Methodology

Research context

The subject of this study is a public School integrated in the University of Algarve, Portugal. It began its activities in 1986 in two campuses and by the time of the data collection had around 8,400 alumni. Like other schools and faculties of the same university, it has been severely affected by the economic and financial crisis since 2008, with strong impacts on its budget and number of enrollments. Until now, little has been done concerning alumni. However, through some sparse initiatives, such as seminars, talks with students and visits to companies, where the collaboration of alumni was required, it has been noted that alumni have always given very enthusiastic help and shown a strong inclination to give further. An indicator that they are willing to commit clearly shows up. However, the resources of the alumni office are an identified weakness if the goal is to accomplish the noble purpose of engagement with the alumni, as expressed in the university's strategic plan.

Research strategy and instrument development

A descriptive marketing research study was conducted to evaluate the research questions and to test the formulated hypotheses. We applied a cross-section design to a target population of alumni, based on a survey questionnaire. The questionnaire comprised three main scales. One

measured the respondents' satisfaction with a set of attributes, another evaluated their perceived image of the School regarding a list of items, and the third measured the alumni's commitment to the institution. A preliminary list of measurement items was initially generated from the literature review. Next, a small group of experts who were familiar with the specificities of the School and had knowledge of the topic reviewed those items. As a result, 49 items were used to measure the concepts and factors under study. Table 1 shows each item of each dimension and the respective references. Some of them, however, had to be adapted to match the specificities of the School, such as Q07; Q08; Q14; Q17; Q18; Q28; Q29; Q32; Q34; Q39; Q46; Q47 and Q48.

All items were measured on an eight-point Likert scale with definition of the extremes. The choice of an even number of points aimed to counteract the tendency of mid-scale answers and the choice of eight points has to do with the concern to approach the measurement scale of a quantitative metric, to assure the adjustment and robustness of the results. Thus, satisfaction was rated using a scale anchored by "1=Extremely dissatisfied" and "8=Extremely satisfied", while the image and commitment constructs were measured using a scale anchored by "1=Strongly disagree" and "8=Strongly agree".

The instrument for the survey also included questions covering sociodemographic characteristics of the respondents, including age, gender, working country, professional situation and alumni membership.

In order to verify the consistency and robustness of the questionnaire, a pretest was conducted to a convenience sample of 24 alumni not included in the target population, and two professors from the areas of marketing and research methodologies. Since no need to improve the questionnaire was identified, it was ready to be used in an electronic survey.

Table 1. Theoretical Model: Constructs

Constructs/Items	Constructs/Items
Sat_education **(Satisfaction with education)**	**Sat_fac/equi** **(Satisfaction with facilities and equipment)**
Q01- Programmatic course content (Elliott & Shin, 2002; Browne *et al.*, 1998)	Q09- Building (Helgesen & Nesset, 2007)
Q02- Practical classes (Browne *et al.*, 1998)	Q10- Class rooms (Helgesen & Nesset, 2007)
Q03- Particularity level (Elliott & Shin, 2002)	Q11- Cleaning (Helgesen & Nesset, 2007; Cronin, 2000)
Q04- Teacher's ability (Helgesen & Nesset, 2007; Elliott & Shin, 2002)	Q12- Security (Helgesen & Nesset, 2007; Cronin, 2000)
Q05- Quality of materials provided by teachers (García-Aracil, 2008; Helgesen & Nesset, 2007)	Q13- Living spaces (Helgesen & Nesset, 2007)
Q06- Availability of teachers to clarify doubts (Helgesen & Nesset, 2007)	Q14- Available resources (library, computer services, study rooms, information systems, electronic tutoring) (García-Aracil, 2008; Elliott & Shin, 2002; Elliott & Healy, 2001)
Q07- Availability of the Course Director (Elliott & Shin, 2002	
Q08- Evaluation system (Browne *et al.*, 1998)	

Sat_serviçes
(Satisfaction with services)
Q15- Performance of support services (secretariat, internships and career services) (Elliott & Shin, 2002; Cronin, 200)
Q16- Timetable of support services (Elliott & Healy, 2001)
Q17- Management (School Direction; Pedagogical Counsel; Scientific Counsel) (Marič et al., 2010; Hartman & Schmidt, 1995)
Q18- Academic information system (intranet) (Marič et al., 2010)

Sat_ sacadenvi
(Satisfaction with social and academic environment)
Q19- Relationship with course colleagues (García-Aracil, 2008; McAlexander & Koenig, 2001)
Q20- Relationship with teachers (McAlexander & Koenig, 2001; Hartman & Schmidt, 1995)
Q21- Relationship with non-academic staff (McAlexander & Koenig, 2001; Hartman & Schmidt, 1995)
Q22- Extracurricular activities and events held in the School (seminars, community meetings, recreational activities) (Rodrigues, 2012)

Imag_educat
(Image of education)
Q23- The course has a good image outside (Duarte et al., 2010)
Q24- Internship has a good image outside (Duarte et al., 2010)
Q25- Employability of the former students is at a good level (Marič et al., 2010; Ivy, 2001)
Q26- The School prepares its students well for work (Marič et al., 2010; Ivy, 2001; Browne et al., 1998 ;Hartman & Schmidt, 1995)
Q27- The School is commited to achive academic excellence (Duarte et al., 2010)
Q28- The School provides quality educational training (Duarte et al., 2010)
Q29- The School is reliable (Duarte et al., 2010; Elliott & Shin, 2002)

Imag_fac/equi
(Image of facilities and equipments)
Q30- The facilities have good quality (Helgesen & Nesset, 2007; Browne et al., 1998)
Q31- Equipments in student's support services are adequate (library, study rooms, computer rooms) (García-Aracil, 2008)
Q32- Student's support services (secretariat, internships and careers services; computer services) are efficient (Marič et al., 2010; Elliott & Healy, 2001; Browne et al., 1998)

Imag_commu
(Image of communication)
Q33- The School has prestige (Duarte et al., 2010)
Q34- The School website is easy to consult and draws one's attention (Duarte et al., 2010; Marič et al., 2010)
Q35- The School promotes events that contribute positively to society (Rodrigues, 2012; Duarte et al., 2010)
Q36- The School's interaction with companies and institutions is positive (Rodrigues, 2012; Alves et al., 2010; Marič et al., 2010; Helgesen & Nesset, 2007)
Q37- The School is innovative and forward-looking (Rodrigues, 2012; Duarte et al., 2010; Alves & Raposo, 2007)

Commitment
Q38- I want to receive regular information on the activities of the school (Brown & Mazzarol, 2008)
Q39- I want to receive information about training offered (Brown & Mazzarol , 2008)
Q40- I am proud to have attended the School (Hennig-Thurau et al., 2001; Nora & Cabrera (1993).
Q41- I identify myself with the School values (McAlexander & Koenig, 2001; Nora & Cabrera,1993)
Q42- I recommend the School to my family and friends (Brown & Mazzarol , 2008; Helgesen, 2008; Hennig-Thurau et al., 2001)
Q43- I recommend my course to my family and friends (Brown & Mazzarol , 2008; Helgesen, 2008; Hennig-Thurau et al., 2001)
Q44- I want to participate in activities where the School needs my help (Gallo, 2012; Fogg, 2008;Weerts et al., 2010; Hennig-Thurau et al., 2001)
Q45- I want to continue my studies in the School (Helgesen, 2008);
Q46-If I have to choose between postgraduate alternatives at the same price, I would choose the School over another institution (Helgesen, 2008)

Q47- I want to receive the School trainees in my company (Gallo, 2012)
Q48- I want to sell my services to the School (Helgesen, 2008)
Q49- I want to enroll in the alumni association (Brown & Mazzarol ,2008; McAlexander & Koenig, 2001; Hennig-Thurau *et al*., 2001))

Sampling procedure

The target population of this research included all alumni of the School who, at the time of data collection, had completed their studies two years previously. A range of graduation covering ten years was taken into account, which was considered as a good representation of the population. A list of 2,743 alumni was provided by the University Academic Services. An e-mail outlining the purpose of the survey was sent to each of these individuals asking for their participation in an academic study. However, around 600 e-mail addresses were identified as incorrect or outdated. Thus, telephone contacts were made to recover those alumni. In the end, 2,544 alumni were contacted by e-mail or telephone and invited to complete a questionnaire. The telephone calls influenced the number of responses, since 25% of the responses came from alumni contacted by telephone. An electronic survey was conducted. Two reminders with a lag of two weeks were sent to all non-respondent alumni. The percentage of total responses before the first reminder was 8%; after that it rose to 18%. The final response rate was approximately 25%, which corresponds to 631 usable questionnaires.

Data analysis and software

IBM SPSS version 21 was used for the descriptive analysis in order to obtain the sample profile. The conceptual model was tested through IBM SPSS Analysis of Moment Structures (AMOS) using the Structural Equation Modeling technique (SEM). AMOS has a graphic interface that permits it to specify the model by drawing it on the screen, and to control all the analysis. Due to the sample size and the complexity of the conceptual model, the SEM was chosen. It is a generalized modeling technique used to test the validity of theoretical models that define multiple dependency relationships between variables, combining the classic techniques of factor analysis and linear regression. The researcher establishes the outset of an explanatory theoretical framework of a phenomenon which attempts to confirm the data analysis (Schumacker & Lomax, 2004). The conceptual model was tested according to a two-step modeling approach. First, confirmatory factor analysis (CFA) was used to access the adjustment

quality of the theoretical model (measurement model), then for step two the hypotheses are tested through a structural equation analysis setting (structural model).

Limitations of the methodology

First, and mostly due to scarce resources, the use of *alumni* focus-groups was not an option, but the authors are aware that their outputs could reveal useful information for this research, namely aspects pointed out as relevant in the academic experience, other determinants of commitment, or what kind of activities to engage alumni in, which could by themselves change completely the conclusions reached, and therefore generalizations of the findings should be cautious. Secondly, the survey should be applied in other schools and faculties of the same university in order to compare results. Thirdly, there should have been a clear identification of the respondents according to whether they were daytime or evening students, to compare results. Fourthly, following the conclusions of Brown and Mazzarol (2008), the hypothesis that image has an influence on satisfaction should be raised, as well as the effect of trust and commitment over satisfaction as stated by Grossman (1999). Finally, the inclusion of latent factors of first and second order to prevent correlations between factors and error terms of items that saturate in different latent factors should be taken into consideration.

Results and discussion

Summary of findings

Along with the concern of finding results to fulfill our objectives, other information is useful to complete the research. In this section, general findings given by descriptive statistics related to the alumni profile are presented in Table 2 as well as the items with higher values in each of the variables under study: "satisfaction", "image" and "commitment", shown in Table 3.

Table 2. Alumni profile

	n=631	%	Mean	SD
Gender				
Male	229	36,3%		
Female	402	63,7%		
Age			33,57	7,601
20-29	208	33,0%		
30-39	291	46,1%		
40-49	107	17,0%		
50-59	22	3,5%		
60-69	3	0,5%		
Working country				
Portugal	583	92,4%		
Overall Europe	28	4,4%		
África	13	2,1%		
Rest of the World	7	1,1%		
Profissional situation				
Employer	39	6,2%		
Independent worker	55	8,7%		
Work for others	471	74,6%		
Without salary	4	0,6%		
Unemployed	70	11,1%		
Retired	3	0,5%		
Student	27	4,3%		
Works at home (housekeeper)	8	1,3%		
Member of Alumni association				
Yes	72	11,4%		
No	559	88,6%		

According to Table 2, the majority of the individuals are women (63.7%). The mean age is approximately 34 years, with a standard deviation of 7.6. The vast majority of the alumni work in Portugal (92.4%) and are employed by others (74.6%). Just 11.4% of them are enrolled in the alumni association. According to Newman and Petrosko (2011), one of the strongest pieces of evidence of the willingness to maintain a committed relationship with the alma mater is related to enrollment in the alumni community.

**Table 3. Perceptions of alumni on satisfaction, image and commitment**

Variable	Items	%	Mean	SD
Satisfaction	Relationship with course colleagues	85.0%	6.66	1.267
	Relationship with teachers	81.4%	6.45	1.229
	Relationship with non-academic staff	81.0%	6.47	1.168
Image	The School is reliable	66.0%	5.96	1.458
	The School website is easy to consult and draws one's attention	60.7%	5.77	1.401
	The scholl provides quality educational training	60.4%	5.70	1.475
Commitment	I am proud to have attended the School	78.4%	6.59	1.507
	I want to receive information about training offered	72.8%	6.33	1.825
	I identify myself with the School values	72.1%	6.27	1.632

Table 3 shows that the higher average values are found in the satisfaction components, especially those concerning relationships, which stresses the RM essence and reveals the positive feelings resulting from the interactions with the alma mater (McAlexander & Koenig, 2001). Concerning image dimension, two items related to education appear with the highest average value and both indicate the assessment of intrinsic quality (Marič et al., 2010). As for "image of communication", the item related to the website stood out, which may be an indicator of the importance given to new sources of information (Duarte et al., 2010). The most highly evaluated items of commitment are related to the sense of belonging and loyalty as identified by Nora and Cabrera (1993), as indicators of commitment towards the institution.

A second set of findings can be observed in Figure 2, and reveals that the determinants of commitment are: "image of education", "image of communication" and "satisfaction with the social and academic environment". However, a preliminary note relative to the explained variance of the dimensions is worthy of attention. Apart from "commitment" with the highest R^2 (78%), "satisfaction with education" should be noted, with the second highest value (72%), and "image of education" with the third highest value (59%). This may be a strong piece of evidence of the importance of items related to education when evaluating overall students' academic experience (Browne et al., 1998; Duarte et al., 2010; Elliot & Shin, 2002). However, our findings do not confirm the direct and positive influence of "satisfaction with education" on "commitment", as explained further below. Concerning the dimensions of satisfaction, only "satisfaction with academic environment" has a positive and direct effect on "commitment" which, once again, reinforces what was said earlier about the importance of relationships. Overall image also plays an important role on whether alumni want to keep close to the alma mater or not (Schlesinger et al., 2016). In these findings, besides "image of education", "image

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of communication" also reveals consistent results that give clues to important matters such as communication strategies (Duarte et al., 2010).

Figure 2. Estimated structural model
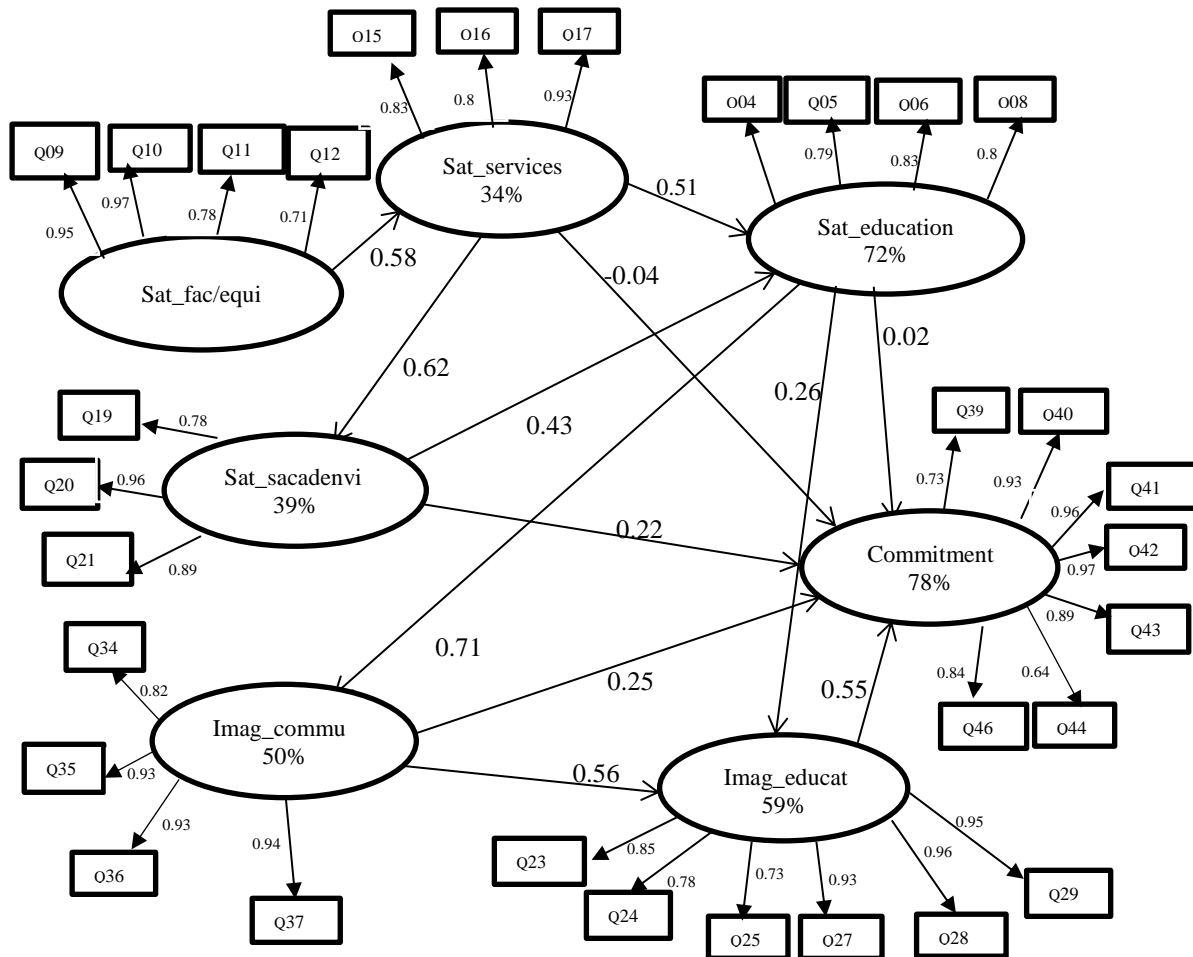
The two-step estimation reveals good quality of the measures and explanatory power of the independent factors as well as the strength and significance of the path coefficients as follows:

Measurement model

The SEM started with estimation of the measurement model through Maximum Likelihood. Skewness and kurtosis presented values near zero which allowed us to conclude a normality assumption. Squared *Mahalanobis* distances indicated the existence of multivariate outliers (p1 and p2 <0.001) and the fit indices indicated the need to modify the model, since their values were considered weak: χ^2=5860.405; χ^2/gl=5.3325; p-value<0.001; GFI=0.668; AGFI=0.630; NFI=0.808; CFI=0.838; RMSEA=0.089. As the fit indices indicated adjustment needs, we checked the possibility of improving model adjustment by adding and removing items and adding trajectories. By finding a correlation between residues, trajectories were added and items

were removed as they saturate at different variables. After the removal of the outliers (98 observations) and the adjustment in the fit indices, the CFA model, showed the following fit indices which can be considered acceptable: χ^2=2098.468; χ^2/gl=3.128; *p-value*<0.001; GFI=0.830; AGFI=0.802 and the following indices, which allowed us to consider a good fit: NFI=0.916; CFI=0.941; RMSEA=0.063.

The reliability and validity were also measured. One of the measures most commonly used to assess the reliability or internal consistency is *Cronbah's alpha*, whose values are shown in Table 4. There is, however, some questioning regarding the validity of *Cronbach's alpha*. Therefore, several authors suggest the use of alternative measures such as the construct composite reliability, which is a measure that estimates the internal consistency of reflective items of each variable. Its values should be located above 0.7. We can conclude that the items have high internal consistency as they all are above 0.7, as can be seen in Table 4. For the assessment of factorial, convergent and discriminant validity (Table 4), λ values are all above 0.5, concluding the factorial validity of all variables. The individual reliability (λ^2), which may also be considered for the factorial validity, must present values equal to or above 0.25, which can also be confirmed in Table 4.

Table 4. Confirmatory factor analysis

	Satisfaction							
Items	**Education**		**Fac. / Equip.**		**Services**		**Soc.Acad.Envir.**	
	λ	λ^2	λ	λ^2	λ	λ^2	λ	λ^2
(Q03) Particularity level	0.743	0.552						
(Q04) Teacher's ability	0.843	0.711						
(Q05) Materials quality	0.810	0.656						
(Q06) Avail teachers….	0.770	0.593						
(Q08) Evaluation system	0.751	0.564						
(Q09) Building			0.958	0.918				
(Q10) Class rooms			0.953	0.908				
(Q11) Cleaning			0.761	0.579				
(Q12) Security			0.684	0.468				
(Q15) Perform. sup.services					0.863	0.744		
(Q16) Timetable sup. services					0.829	0.687		
(Q17) Management					0.878	0.770		
(Q18) Acade. Infor. system					0.723	0.522		
(Q19) Relation. course collea.							0.767	0.588
(Q20) Relation. with teachers							0.950	0.903
(Q21) Relation. with non-acad							0,880	0,775
Cronbach's alpha	0.905		0.926		0.899		0.910	

	0.889	0.909	0.895	0.902
CCR				

	Image						**Commitment**	
Items	**Education**		**Facilities Equi.**		**Communication**		**Commitment**	
	λ	λ²	λ	λ²	λ	λ²	λ	λ²
(Q23) Course ima.	0.760	0.578						
(Q24) School inter.	0.682	0.465						
(Q25) Employ….	0.613	0.376						
(Q26) School prep.	0.833	0.694						
(Q27 School comm	0.881	0.776						
(Q28) School prov.	0.927	0.860						
(Q29) School reliab	0.878	0.770						
(Q30) Facilities..			0.932	0.868				
(Q31) Equip…			0.852	0.727				
(Q33)School prestige					0.832	0.693		
(Q34) School web*site*					0.761	0.579		
(Q35) School prom..					0.873	0.761		
(Q36) School's inter.					0.867	0.752		
(Q37) School innov..					0.886	0.785		
(Q38) Want infor….							0.629	0.396
(Q39) Receive train…							0.661	0.437
(Q40) Proud School							0.904	0.817
(Q41) Identify myself							0.941	0.885
(Q42) Reco. School…							0.956	0.914
(Q43) Reco. course….							0.842	0.709
(Q44) Want partic. acti							0.580	0.337
(Q45) Want studies..							0.705	0.497
(Q46) If I have to							0.802	0.643
Cronbach's alpha	0.949		0.903		0.948		0.953	
CCR	0.926		0.887		0.926		0.936	

χ^2=2098.468; χ^2/gl=3.128; *p-value* <0.001; GFI- 0.830; AGFI- 0.802; NFI- 0.916; CFI- 0.941; RMSEA- 0.063

The assessment of convergent validity is made by average variance extracted (AVE) (Fornell & Larcker, 1981). Its values are set on the diagonal of Table 5 and they are all above 0.5. Given that AVE ≥0.5 translates as adequate convergent validity, our results demonstrate that AVE is appropriate in all variables. On the other hand, the discriminant validity is confirmed by most of the variables, as the AVE value is greater than the correlation square between factors (r^2).

Table 5. AVE values and correlations squares between variables

Variables	1	2	3	4	5	6	7	8
S.Education (1)	**0.74**							
S.Facilities Equipm. (2)	0.21	**0.82**						
S.Services (3)	0.40	0.25	**0.79**					
S.Soc. Acad. Envir.(4)	0.41	0.18	0.29	**0.85**				
I.Education (5)	0.54	0.20	0.42	0.31	**0.76**			
I.Facilities Equipm. (6)	0.28	0.79	0.38	0.22	0.42	**0.59**		
I.Communication(7)	0.45	0.27	0.46	0.28	0.76	0.51	**0.82**	
Commitment (8)	0.62	0.23	0.31	0.37	0.62	0.42	0.58	**0.80**

Structural model

Maximum Likelihood estimation of the structural model allows us to determine the interrelationship between the endogenous latent variables and at the same time allows us to understand how they act on each of the exogenous latent variables. It also permits, by taking into account the measurement error terms, the possibility that there are other determinants of the analyzed variables. The goodness of fit statistics indicated poor fit: χ^2=3660.615; χ^2/gl=5.344; *p-value* <0.001; GFI=0.770; AGFI=0.738; NFI=0.852; CFI=0.876; RMSEA=0.090. Modification indices indicated the need for removing items and adding trajectories to refine the adjustment. After these changes, we obtained the following fit measures: χ^2=1400.051; χ^2/gl=3.357; *p- value*<0.001; GFI=0.863; AGFI=0.837, which still displayed a poor fit. However, NFI=0.925; CFI=0.946; RMSEA=0.067 showed a better adjustment then the previous model.

Structural model statistics are shown in Table 6. Regression Weights show two coefficients that are statistically insignificant, so hypotheses 1 and 2 are rejected. By removing the variable "image of facilities and equipment", hypothesis 13 is no longer considered. The remaining cases are confirmed for a 5% significance level. For the analysis of standardized regression coefficients (γ) and only mentioning the three higher values, the following trajectories are highlighted: H9, γ_9=0.705; H7, γ_7=0.620 and H8, γ_8=0.580. For the analysis of the positive and direct effect on "commitment", it appears: H4, γ_4=0.545; H5, γ_5=0.250 and H3, γ_3=0.220.

Table 6. Hypotheses tests

Hypotheses				Estimat.	S.E.	C.R.	P	Results
Sat_serviçes	<---	Sat_fac/equi	H8	0.522	0.041	12.756	***	accep.
Sat_sacadenvi	<---	Sat_serviçes	H7	0.644	0.052	12.374	***	accep.
Sat_education	<---	Sat_serviçes	H6	0.783	0.081	9.683	***	accep.
Sat_education	<---	Sat_ sacadenvi	H12	0.637	0.071	8.965	***	accep.
Imag_commu	<---	Sat_education	H9	0.528	0.036	14.603	***	accep.
Imag_education	<---	Imag_commu	H11	0.621	0.052	11.916	***	accep.
Imag_education	<---	Sat_education	H10	0.210	0.040	5.182	***	accep.
Commitment	<---	Imag_education	H4	0.744	0.060	12.391	***	accep.
Commitment	<---	Sat_education	H1	0.025	0.074	0.341	0.733	reject.
Commitment	<---	Sat_serviçes	H2	-0.063	0.075	-0.842	0.400	reject.
Commitment	<---	Imag_commu	H5	0.375	0.063	5.947	***	accep.
Commitment	<---	Sat_ sacadenvi	H3	0.366	0.067	5.496	***	accep.
Imag_education	<---	Imag_fac/equi	H13	-	-	-	-	-
Standardized regression coefficients (γ)								
Sat_serviçes	<---	Sat_fac/equi		0.580				
Sat_ sacadenvi	<---	Sat_serviçes		0.620				
Sat_education	<---	Sat_serviçes		0.510				
Sat_education	<---	Sat_ sacadenvi		0.431				
Imag_commu	<---	Sat_education		0.705				
Imag_education	<---	Imag_commu		0.564				
Imag_education	<---	Sat_education		0.255				
Commitment	<---	Imag_education		0.545				
Commitment	<---	Sat_education		0.022				
Commitment	<---	Sat_serviçes		-0.036				
Commitment	<---	Imag_commu		0.250				
Commitment	<---	Sat_ sacadenvi		0.220				

χ^2=1400.051; χ^2/gl=3.357; *p-value* <0.001; GFI=0.863; AGFI= 0.837; NFI=0.925; CFI=0.946; RMSEA= 0.067

Discussion of findings

Concerning satisfaction variables, only "satisfaction with social and academic environment" has a direct influence on "commitment" (H3) with a 0.220 effect. This emphasizes the importance of the relationship between students and the HEI in order to maintain long and lasting bonds with the alumni, as is recommended by RM. This is, therefore, an element to be taken into account by the definition of marketing strategies since it is a key element to ensure the voluntary and conscious connection of alumni to the alma mater. Through H1 and H2, we aimed to test whether "satisfaction with education" and "satisfaction with services" had a direct

effect on "commitment", but both were rejected. However, they indirectly influence "commitment", as can be seen in Table 7. Still, "satisfaction with education" presents a high explained variance of 72% through "satisfaction with services" ($\gamma_6=0.510$) and "satisfaction with social and academic environment" ($\gamma_{12}=0.431$), which underlines education as a significant dimension in academic experience. Furthermore, since there is a positive and direct influence of "satisfaction with education" in the variables "image of communication" ($\gamma_9=0.705$) and "image of education" ($\gamma_{10}=0.260$), these effects must be considered in the definition of management strategies. Besides "satisfaction with education", "satisfaction with services" ($R^2=34\%$) also has a strong effect on "satisfaction with social and academic environment" ($\gamma_7=0.620$). Bearing in mind that "satisfaction with services" catches a certain humanware and performance evaluation, it is interesting to verify its influence in this last dimension.

Concerning image constructs, we should stress its positive and direct influence on "commitment". The "communication image" has a path of 0.250 to "commitment" (H5). This construct has a $R^2=50\%$ and it is explained by the "satisfaction with education". H4 establishes a positive and direct influence of the "image of education" on "commitment", which is confirmed ($\gamma_4=0.545$). The construct is explained by the "satisfaction with education" and the "image of communication" with a 0.564 effect (H11). These figures indicate the need for a permanent improvement concerning the School's image.

"Commitment" has an explained variance of 78%. A careful look must be taken into its components whose regression weights are: (Q39) "I want to receive information on the educational training that the School offers", with $\lambda = 0.729$; (Q40) "I am proud to have attended the School", with $\lambda = 0.928$; (Q41) "I identify myself with the School values", with $\lambda = 0.956$; (Q42) "I recommend the School to my family and friends", with $\lambda = 0.974$; (Q43) "I recommend my course to my family and friends", with $\lambda = 0.891$; (Q44) "I want to participate in activities where the School needs my help", with $\lambda = 0.644$; (Q46) "If I have to choose between postgraduate alternatives at the same price, I would choose the School over another institution", with $\lambda = 0.843$. These figures allow the identification of several dimensions, such as loyalty (through Q39 and Q46); recommendation (through Q42 and Q43); sense of belonging, identity or even affinity values (through Q40 and Q41); and finally the will to give back (expressed by Q44).

The *Sobel* test was applied for each of the indirect effects, in order to test their statistical significance, and proved that they are all statistically significant at the 5% significance level.

The indirect effects on "commitment" are as follows: "satisfaction with services", with an effect of 0.567; "satisfaction with education", with an effect of 0.532; "satisfaction with the facilities and equipment" and "image of communication", with an effect of 0.308, and "satisfaction with social and academic environment", with an effect of 0.239. Table 7 shows other significant indirect effects, that is, the case of the indirect effect of "satisfaction with services" on "image of communication" (0.548) and "satisfaction with facilities and equipment" on "satisfaction with education", to mention just the higher ones. As explained before, this information is important as it suggests important clues for a strategies framework.

Table 7. Standarized total and indirect effects

Total effects	Sat_fac/equi	Sat_servi	Sat_sacaden	Sat_educ	Imag_com	Imag_edu
Satisf_services	0,580					
Satisf_sacadenvi	0,359	0,620				
Satisf_education	0,451	0,777	0,431			
Image_commun	0,318	0,548	0,304	0,705		
Image_education	0,294	0,507	0,281	0,652	0,564	
Commitment	0,308	0,531	0,459	0,554	0,557	0,545
Indirect effects and significance						
Satisf_services						
Satisf_sacadenvi	0,359***					
Satisf_education	0,451***	0,267***				
Image_commun	0,318***	0,548***	0,304***			
Image_education	0,294***	0,507***	0,281***	0,298***		
Commitment	0,308***	0,567***	0,239***	0,532***	0,308***	

*** $p < 0,001$; ** $p < 0,01$; * $p < 0,05$

Parallels with other studies

The literature review reveals satisfaction as a direct determinant for relationship maintenance and alumni loyalty, as stressed by the studies of Alves and Raposo (2007); Brown and Mazzarol (2008); Helgesen and Nesset (2007); and Schlesinger et al. (2016). Our findings partially confirm this, as only the social and academic environment dimension is a direct driver of commitment. Items of this dimension are: "relationship with teachers", "relationship with course colleagues", and "relationship with non-academic staff". These findings reinforce what was stated by Kotler and Fox (1994), who named the effectiveness in relationships as a key factor of success. From a RM perspective, the findings also match those of Al-Alak (2006); Antunes and Rita (2008); Grönroos (1994); Gummesson (1997); Helgesen (2008); Kotler,

Wong, Saunders, and Armstrong (2005); McAlexander and Koenig (2001); and Zeithaml, Bitner, and Gremler (2006).

Another available parallel refers to the variable loadings. The measurement model shows significant loadings especially in "satisfaction with education". Its importance was also underlined by Browne et al. (1998); Elliott and Shin (2002); and Helgesen and Nesset (2007). At the same time, its direct influence on "image of communication" and "image of education" is in line with the conclusions of Helgesen and Nesset (2007). We can conclude that image variables are drivers of commitment. Similar findings point to image as a predictor of loyalty, recommendation, and strong connection with the institution (Alves & Raposo, 2007; Brown & Mazzarol, 2008; Helgesen & Nesset, 2007; Jiewanto et al., 2012; Kotler & Fox, 1994; Schlesinger et al., 2015) which are, for the purposes of this study, the components of commitment. Image of communication is particularly mentioned by Duarte et al. (2010) and Rodrigues (2012). Items of image of education emphasize the parallels with the studies of Brown and Mazzarol (2008); Duarte et al. (2010); Helgesen and Nesset (2007) and Rodrigues (2012).

As regards commitment, the confirmation of loyalty, recommendation, sense of belonging, identification with the institution, and the will to give back expressed in the different items of the construct reinforce the results of Brown and Mazzarol (2008); Gallo (2012); Helgesen (2008); Hennig-Thurau et al. (2001); McAlexander and Koenig (2001) and Nora and Cabrera (1993).

Conclusions and implications

Main conclusions

A quantitative research approach was used to identify determinants for the commitment relationship maintenance between the alumni and the alma mater. The survey data were analyzed using the SEM technique. By applying a two-step modeling approach, the final results permit us to reach the following conclusions: (1) the determinants for the commitment relationship maintenance between the alumni and alma mater are "image of education", "image of communication" and "satisfaction with social and academic environment", which therefore provides an answer to the overarching research objective of this study; (2) the items of satisfaction given by the structural model: "relationship with course colleagues, with teachers and with non-academic staff", provide the answer to research question 1; (3) regarding image dimensions, the items were identified as follows: "the School website is easy to consult and

draws one's attention"; "the School promotes events that contribute positively to society"; "the School's interaction with companies and institutions is positive"; "the School is innovative and forward-looking"; "the course has a good image outside the institution"; "the internship component has a good image outside the institution"; "the employability of the former students is at a good level"; " the School is committed to achieving academic excellence"; "the School provides quality educational training"; "the School is reliable", thus responding to research question 2; (4) the components of commitment which identify the determinants for the future relationship between alumni and alma mater, as stated by research question 3, were found through the willingness to continue educational training in the School through the items: "I would choose the School over another institution to attend a course of similar nature", and "reception of information on the educational training offered". Recommendation is also stressed since the results show the willingness to recommend the School and the course. Sense of belonging was also identified by the items that denote pride and sharing of values. Finally, the willingness to give back was also expressed through the statement of giving their help whenever it is needed.

Managerial implications

The conclusions of this study provide a set of clues for management. A permanent reinforcement of the quality of the image of both education and communication has to be ensured. The actions to be taken must accomplish effective communication strategies with alumni, and promote activities in order to achieve their gradual involvement with the School. Good and effective communication channels are required, supported by "Customer Relationship Management" features that allow efficient management of the alumni community. The identification of the variables' components of "image of education" and "image of communication" that most influence the commitment relationship maintenance should be a concern. Every event outcome must show how much the School cares about its students and particularly its alumni. Thus, the institutional values, identified by the "satisfaction with social and academic environment" dimension, must always be taken into account when planning the activities with and for the students and alumni. This is an issue to emphasize by the promotion of those activities, and especially in communication with alumni, recalling that alma mater means "nursing mother", and therefore she should maintain constant attention to her "children", particularly through concrete actions such as sending birthday wishes, sending out newsletters, the organization of an Alumni Day and an Alumni Career Award, the promotion of social responsibility events in which alumni are invited to participate, or the offer of career support

services (Bernal & Mille, 2013; Çetin, 2004; Martin et al., 2015; McAlexander & Koenig, 2001; Okunade & Berl, 1997; Paradise, Heaton, & Kroll, 2016). Some of these actions have already been implemented. The School's commitment to its students is mainly shown through the guarantee of the continuity of educational and scientific quality and through aspects concerning employability. Here, it is necessary to make an assertive connection with companies in order to provide a good fit between the type of educational training offered and what companies are actually looking for. In this task, the alumni can play an important role as interlocutors and at the same time by sharing their experience.

On the other hand, the alumni commitment highlights a willingness to pass on positive references to family and friends, either regarding the course or the School itself. The alumni assume the role of ambassadors, in terms of disseminating the educational training offered and the general activities of the School. Their help is critical and potentially very effective, especially when the marketing campaigns are targeting potential students. Events like campus open days can achieve a great level of success if the alumni are given specific roles, such as testimonies in promotional materials, or participation in seminars and lectures, which may be the most effective roles. The components of commitment which are related to the sense of belonging and affinity values form a strong basis for a voluntary collaboration of alumni with the School, but on the other hand, this must also be assumed as the School´s responsibility towards them, since they are its partners.

Limitations and suggestions for further research

The main limitation concerns the latent variables. The determinants of commitment were confined to satisfaction and image, whereas the literature identifies other significant determinants such as trust, brand, prestige and reputation (Chapleo, 2004; Holmes, 2009; McAlexander & Koenig, 2012; Nora & Cabrera, 1993; Sampaio, Perin, Simões, & Kleinowski, 2012; Sung & Yang, 2008). The conceptualization of commitment did not include items related to fundraising. Although in Portuguese HEIs this activity has a very weak expression, taking it into consideration in the construct could have provided some interesting information. Some of the items used to measure commitment tried to meet some specificities of the research context. Although it was pointed out that they were considered drivers of commitment only for the purposes of this study, the authors recognize that it might lead to some confusion related to loyalty drivers. Further research needs to be developed regarding alumni loyalty. It should also be noted that both determinants, i.e., satisfaction and image, were assessed taking into account the alumni's academic experience. It would, however, be interesting to consider other issues to

evaluate their present perceptions towards the institution, as the study of Alnawas and Phillips (2015) suggests. Another interesting and worthwhile relationship variable to be considered is alumni-alma mater identification, as the studies of Mael and Ashforth (1992) and Schlesinger et al. (2015) testify.

A further important research path is a deeper understanding of predictor factors of the commitment components. Although the general knowledge provided by findings on commitment gives marketers tools for action, an accurate study of each of its components is needed to identify which ones effectively influence the future relationship with alumni, and to understand their impacts on commitment components. Another required task is to draw up the "committed" profile, where different variables are used to cover academic experience and present the situation of alumni. The institution needs to be able to identify those who are willing to keep close to it. This information permits the definition and segmentation of targets for specific activities to be developed. It would also be of interest to consider in future research the moderating effect of the time of graduation in satisfaction and image on commitment, bearing in mind that alumni's perceptions may vary according to when they graduated (e.g., alumni who graduated two years ago may have different perceptions when compared with alumni who graduated eight years ago).

Finally, it is important to reiterate that findings are based on alumni from only one institution, as can be found in some other studies (e.g., Bingham, Quigley & Murray, 2003; Helgesen & Nesset, 2007; Marič et al., 2010; McAlexander & Koenig, 200; Robinson & Celuch, 2016). This drawback does not affect internal validity of our findings because almost all alumni from a graduation range covering ten years, covering all study programs, were contacted for a survey and a substantial proportion of them were included in the study, but it limits the external validity of the findings. Since the sample is representative of the target population of alumni of this young University School, the findings are useful for supporting decision making in the institution in which the study was carried out, which was one of the main motivations for this study. However, there is no point trying to generalize our findings for other institutions, because alumni from other schools of the same university, and from other Portuguese universities, may have different experiences, attitudes and relationships with their alma mater. Therefore, more studies are highly recommended at other institutions, both schools and universities.

and structure of this manuscript.

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