



Questionnaire for the assessment of factors related to university degree choice in Spanish public system: A psychometric study



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ABSTRACT

Universities are interested in attracting students, but they do not usually have data relating to students' intentions. Furthermore, both general and subjective factors are taken into account by students when choosing a degree and a university. This paper presents a psychometric study of a questionnaire which aims to assess variables relating the aspects involved in the selection process and accessing the Spanish university system. This questionnaire considers six factors: Consideration of the University; Perceived Usefulness; Social Impact; Vocational Aspects; Influence of Surroundings and Geographic Location. The item analysis (discrimination index) reduced the questionnaire to 25 items, and the reliability and validity of this final questionnaire was analyzed using a sample of 1532 students from eight Spanish universities. The results showed that the reliability as internal consistency of the six factors was high; the construct validity showed a structure of six first order factors clustered in two second order factors and finally, there was high discriminant validity between groups defined by variables such as gender or academic area. Applying predictive analytics to the results of this questionnaire will then enable specific recruiting policies to be applied, which target the type of students that universities are looking for, while reducing costs.

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1. Introduction

Information technology and communication, or ICT, are now present in almost every aspect of campus life, reaching far beyond what we might call administrative management to academic management and, through specific tools, to teaching and learning processes, research and research management, etc. This enables a large quantity of information to be obtained that can then be reused to improve the system.

“Learning Analytics (LA) is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs. Academic analytics, (AA), is the application of business intelligence in education and emphasizes analytics at institutional, regional, and international levels” (Long & Siemens, 2011). AA datasets combine statistical techniques, process modeling, and predictive models to analyze the performance of the organization and propose improvement systems, (Goldstein & Katz, 2005). An interesting contribution from the point of view of Data Mining can be found in Romero and Ventura (2007), and in Minaei Bigdoli et al., (2003).

In this respect, this study addresses one of the fundamental problems faced by universities: the recruitment of talent. The best students are desired by the best universities and even by universities which are not rated as highly.

This problem is a result of two determining factors: firstly, each of the countries' specific laws regulating access to the university; and secondly, the factors which lead students to select a particular university degree.

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The factors that lead students or their families to choose a certain university and higher education degree have been studied by several authors, and especially by universities themselves (Guerra & Rueda, 2005). Knowledge of these factors can obviously lead to a competitive advantage when designing advertising campaigns and activities targeting potential clients. Using this kind of language, which relates more to commercial marketing than academic discourse, was frowned upon by some sectors of the academic community just a few years ago, but strictly marketing-based student attraction strategies would not have a promising future (Maringe, 2006; Perna & Titus, 2004; Price, Matzdorf, Smith, & Agahi, 2003). However, the current competitive environment has led it to be assumed that such techniques and procedures should and are used to attract talent. With proper recruitment policies and guidance the cost of attracting students can be lowered while improving results. According to the European Access Network (EAN) (www.ean-edu.org) recruitment costs per student admitted varies from €3 to €7.

The recruitment systems depend on several factors, the first of which include the procedure for accessing the university system, and the financing of the system itself. In Spain, there are 81 universities, of which 32 are private and 49 are public. The public universities admitted a total of 245,181 students in 2012, representing 78.4% of all new students in Spanish universities. These students were enrolled in one of the 4358 degree programs offered by public universities.

Access to private universities which freely set their prices, is based on the submission of an application and acceptance for admission by the private college based on its own criteria. On the other hand, the public university system is funded by the state, and students only pay from 10% to 15% of the actual estimated cost of their studies. The majority of students in Spain attend public which have the highest number of degrees. These public universities offer a certain number of places for each degree course. In order to be admitted, students are required to take a university entrance exam known as, PAU (*Prueba de Acceso a la Universidad*) and may then request enrollment in a given maximum number of degree courses in order of preference. Based on the marks obtained on the PAU, students are then either assigned a place in a university degree course, or they fail to obtain a place. Consequently students use strategies to try to optimize their chances of being admitted into the desired degree course, since in the end they may not be accepted into the degree course they prefer or even be given a place in the University.

In other European countries, the students are required to pass an entrance exam for the specific degree course requested (Parry et al., 2006). In the case of China, there is an entrance test called Gaokao, which is similar to the Spanish exam but is much more restrictive, and in Australia, there are specific tests, such as the GAMSAT for Medical Schools, (Dawson, Macfadyen, Lockyer, & Mazzochi-Jones, 2011). In the USA, recruitment systems are based on a system where applications are submitted and are either accepted or rejected, but in this case the financial resources of prospective students and scholarship and grant policies play a decisive role. This process has been studied from different points of view. The Gale-Shapley algorithm (1962) for the assignment of students to universities is a basic reference (Gale & Shapley, 1962). Murphy and McGarrity (1978) concluded that the consideration of the quality of the system and confidence in the institution was the key factor for students when making a choice. The results have been effectively tested in the case of engineering (Yurtseven, 2002), or that of the recruitment of women and ethnic minorities, (Ford, 2008; Leppel, Williams, & Waldauer, 2001; Turner & Thompson, 1993). As discussed earlier, other authors analyze the relationship

between the attraction and retention of these students (León, 2011; Tinto, 2006), while others (Misran et al., 2012) consider the influence of the socio-economic status of the students enrolled on their decision regarding which college to select, and finally, others (Huffman, Whetten, & Huffman, 2013) study the relationship between the factors of gender and academic outcomes and use of technologies.

In Spain the first approach to identifying indicators of quality in the choice of degree and university studies appears in Guerra and Rueda (2005) and Capilla (2009), studying the evolution of these indicators depending on the demand especially in degrees with high/low demand. It is considered that the demand for a degree or university is directly related to the students' and their environment's subjective perception of that degree (Baker & Brown, 2007; Maringe, 2006). Furthermore, students' perceptions of such indicators do not seem to have been appropriately verified. In many cases utility is attributed to degrees that are not actually in great demand, and vice versa. Moreover, it has been found that although they appear repeatedly in studies and forums, personal factors and the social influence affecting decision-making, have not been adequately measured (Barnes & Mattson, 2009; Bowden & Wood, 2011; Guerra & Rueda, 2005; Lubben, Davidowitz, Buffler, Allie, & Scott, 2010). Also significant are the strategic actions taken by universities aimed at recruiting students either directly or indirectly through strategic plans in R+D+i, comprehensive management or a relationship with the environment (Corominas & Sacristan, 2011; León, 2011) or perhaps by using social networks, because those who are best connected do better in their life (Benson, Morgan, & Filippaios, 2014; Cheung, Chiu, & Lee, 2011).

The information regarding the preferences or criteria that lead students to select a certain university degree, is, in fact data which give universities a competitive and strategic advantage when designing their recruitment programs.

Universities have the need to implement analytical procedures in order to analyze factors such as performance in terms of means of access, dropping out, dependence on the access mark, etc. Furthermore, predictive models should be developed to identify the students who are most preferable, in order to be more effective and achieve greater performance. In the case of the European Higher Education Area, EHEA, systems for validation, verification and accreditation of degrees have been established. This is an age where accountability and liability of public Institutions is demanded, and the AA is a suitable instrument for achieving this purpose.

Having first analyzed and compared the Spanish public university access system to the access systems in place in other universities, and then explained the relationship between this problem and AA, Section 2 of this paper describes the aims of our study, Section 3 focuses on the method followed for obtaining the questionnaire, Section 4 presents the results and confirmatory statistical analysis, and finally, Section 5 presents the conclusions of our study.

2. Objectives

Our objective is to present a psychometric study of a questionnaire that has been developed for the study of variables relating to social and personal aspects involved in the university selection process and accessing the Spanish public university system. As shown by Guàrdia et al. (2012), Guàrdia et al. (2013), or Hervás, Guàrdia, Peró, Capilla, and Soriano (2013) this process involves factors associated with mechanisms for pre-registration in Spain, such

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