Understanding social responsibility's influence on service quality and student satisfaction in higher education

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ABSTRACT

Understanding customers' expectations regarding organisations' social responsibility is fundamental to creating and implementing successful strategies and programmes. More specifically, this process requires the development of a theoretical framework in order to analyse the impact of universities' social responsibility strategies on service quality and students' satisfaction with higher education. The present study sought to identify the factors defining students' perceptions of university social responsibility (USR) and to analyse its impact on their satisfaction and service quality. The research was carried out in a Portuguese higher education institution, with a sample of 903 students. Structural equation modelling was used to test the proposed research model. The results validate this explanatory model of USR and the latter's influence on service quality and higher education students' satisfaction. Concerning USR's effects, the findings include that, from the students' perspective, USR contributes most directly to quality education through USR's cognitive impacts, that is, those associated with research. This study's results also corroborate that a strategy focused on sustainable development (i.e. promoting a responsible university) influences students' positive perceptions and functions as an antecedent of service quality and student satisfaction.

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1. Introduction

Social responsibility (SR) is becoming an increasingly important concept in the debate about how to maintain competitiveness and sustainability in the context of globalisation. This concept has been used to defend commonly held values and to strengthen feelings of solidarity and cohesion (Vasilescu et al., 2010). In conjunction with SR values, the United Nations Educational, Scientific and Cultural Organisation's (2009) declaration offers extremely relevant contributions in terms of how universities' principles and values relate to daily life in society at large. These include dignity, freedom, citizenship, democracy, participation, social and supportive coexistence, the common good, social equity, environmentally sustainable development and an acceptance and appreciation of diversity. More specific university values comprise commitment to truth, integrity, excellence and interdisciplinary dependence.

Thus, the university SR (USR) paradigm goes beyond 'social projection and university extension' to foster a more holistic reflection on universities as academic institutions that influence social environments (Vallaeys, 2013). Universities accomplish this by spreading and implementing four key processes: teaching, research, extension and internal management. These have their respective impacts through educational service provision and knowledge transfer based on ethical principles, good governance, respect for the environment, social engagement and the promotion of values, thereby fulfilling USR's true demands (Vallaeys, 2013).

Arambewela and Hall (2006) argue that students' satisfaction is the best barometer of educational services' quality, which has received the most attention from higher education institutions (HEIs) seeking competitive advantages. These institutions' primary challenge is to understand and channel their resources to achieve customer satisfaction. According to Abouchedid and Nasser (2002), customers' (i.e. students) perceived service quality and the

institutions' (i.e. universities) perceptions may not coincide, so monitoring service quality in HEIs' different organisational units and services has become a fundamental component of managing contemporary universities.

According to Burcea and Marinescu (2011), various studies have focused on USR and students' perceptions of SR are the subject of an important stream of research (e.g. Panwar et al., 2010). However, until now, few studies have dealt with students' views on HEIs' SR activities (e.g. Burcea and Marinescu, 2011; Setó-Pamies et al., 2011). In addition, a review of the relevant literature revealed little research on the application of corporate SR (CSR) in educational contexts. These studies also show a lack of consensus on a conceptual framework with which to analyse how universities are implementing USR principles in their management. Furthermore, few studies have included perceptions of USR, service quality and student satisfaction in Portuguese higher education.

Despite the significance of USR to HEIs' competitiveness and students' predominance as the main actors in these institutions, academic initiatives seldom seek to meet students' expectations and needs in relation to SR programmes. Therefore, the present study sought to contribute to filling these gaps by making its main objective to determine students' perception of USR in an HEI in a sparsely populated region of Portugal. In addition, this research aimed to analyse this perception's impact on service quality and students' satisfaction with higher education.

The paper below is structured as follows. After this introduction presenting the work to be carried out, the second section provides the theoretical framework of SR, satisfaction and service quality, as well as the hypothesis development and conceptual research model. The third section describes the methodology, including the methods and tools used. The fourth section presents the research's results, while the fifth section discusses these. The final section offers the main conclusions and suggestions for future research.

2. Literature review

2.1. University social responsibility

2.1.1. SR in HEIs

SR comprises situations in which firms adopt a wider business vision and assume responsibility for their impact on society at large (Carroll, 1979). Elkington (1997) was the first to argue that the concept of sustainable development involves the integration of economic, environmental and social dimensions. Carroll (1979), in turn, defined four components of SR and extended its scope by suggesting that companies should fulfil economic, legal, ethical and philanthropic responsibilities in order to meet fully these firms' obligations to society.

Economic responsibilities refer to companies' obligations to be productive and profitable (Maignan, 2001). Legal responsibilities refer to the set of legal requirements these firms must satisfy when fulfilling their economic duties (Carroll, 1979). Ethical responsibilities are the appropriate behaviours defined by the established norms that companies need to follow, and philanthropic responsibilities reflect people's commonly expressed desire to see firms actively involved in improving society (Maignan, 2001).

Valentine and Fleischman (2008) presented a conceptualisation of CSR based on Carroll's (1979) studies, which defines it as society's economic, legal, ethical and discretionary expectations of organisations at any given time. As a result, a new line of research emerged extending SR to other organisations, such as public administration institutions and HEIs (Vasilescu et al., 2010; Vallaeys, 2013, 2016; Vázquez, Aza, & Lanero, 2014, 2016). The concept of USR has thus clearly been spreading as it is now essential to universities' ability to function correctly while carrying out their

initiatives and following up on institutional objectives that meet social development's demands (Borja and Rodríguez, 2016).

According to Vallaeys (2007), USR is an ethical quality policy that seeks to align HEIs' four processes of management, teaching, research and extension with the universities' mission, values and social commitment. This is done by harmonising institutional management and fostering transparency and participative dialogues between all university community members (i.e. authorities, students, lecturers and administrators) and the multiple stakeholders who need universities to perform well. USR thus contributes to the effective transformation of society by resolving problems of exclusion, inequality and sustainability.

Universities need to make an effort to promote USR by supplying academic services based on social diagnosis, promoting quality teaching in all areas and developing research projects. In addition, HEIs must fulfil their plans of creating associations with society at large, carry out a policy of complete inclusion, improve the teaching staff's pedagogical skills and provide society with highly qualified, competitive professionals (Borja and Rodríguez, 2016). Universities have a direct impact on the future of society through training professionals and leaders, but HEIs also are social actors that can shape students' education to match external social situations and make knowledge accessible to all (Ceulemans and De Prins, 2010). Universities should, therefore, seek to go beyond treating 'social projection and university extension' as well-intentioned appendices to HEIs' central roles of educating students and producing knowledge, and instead address USR's real demands (Vallaeys, 2013). In this way, HEIs become a catalyst of dynamic social change (Vasilescu et al., 2010).

Given that universities are a fundamental pillar of society, their function is increasingly to prepare students for various vocations of social relevance, helping students to find their direction in life and think beyond their individual interests rather than simply issuing diplomas (Vasilescu et al., 2010). In this way, universities play a fundamental role in developing the coming generations' skills and aptitudes to ensure these individuals successfully deal with globalisation and economic growth and build a sustainable future for people everywhere (Setó-Pamies et al., 2011).

Competitiveness in HEIs is now taken for granted as these are considered a type of business. SR as a competitive advantage is an expanding phenomenon in economic and political spheres (Esfijani et al., 2013), but the application of SR in universities suffers from deficiencies similar to those found in the business world. No clear, specific and unanimously accepted consensus exists regarding USR's meaning or its concrete applications, as well as how these are reflected in initiatives or strategies that facilitate socially responsible behaviours (Quezada, 2011). In recent years, USR has gained greater prominence in academia, especially in terms of HEIs' strategic management and the introduction of specialised and postgraduate courses (Quezada, 2011). SR has become one of universities' favoured strategies to develop a good reputation and competitive advantages (Casani and Pérez-Esparrells, 2009; Dahan and Senol, 2012).

Thus, HEIs' implementation of SR strategies needs to be considered a way to attain real competitive advantages and positive reputations (Dahan and Senol, 2012). In addition, to competing in the changing education sector and fulfilling their mission in a constantly transforming world, HEIs must recognise that their own actions should reflect the values and norms for which they stand (Dahan and Senol, 2012). Socially responsible universities are continuously committed to solving community problems through knowledge production, developing active and engaged citizens, contributing to social change and considering moral values. Ultimately, the provision of these high quality services will result in sustainable development (Esfijani et al., 2013).

Currently, the competitiveness of universities is increasingly dependent on the implementation of sustainable development and social responsibility measures, and there is an increase in the interest of higher education institutions for sustainability and their implementation in various elements of higher education systems (Ramos et al., 2015). In this sense, the community at large, and HEIs in particular, should be involved in the pursuit of the Sustainable Development Goals (SDGs), as an unparalleled opportunity is offered to HEIs, not only in teaching and research, but especially as regards extension activities, acting as advocates of public opinion in support of the SDGs (Leal Filho et al., 2019).

2.1.2. Impacts of USR

In higher education, the integration of sustainable development can traditionally be conducted at different levels, namely, teaching, research, internal management and extension (e.g., Lozano and Young, 2013). Concerning teaching specifically, various authors (e.g. Lozano and Young, 2013) argue in favour of the inclusion of sustainable development content in transversal or horizontal ways in curricula.

SR also comprises universities' commitment to deal with their activities' wider social impacts, so USR is frequently said to have the potential to contribute to both these institutions' environmental and social sustainability (Vallaeys, 2007). The most practical method of delimiting the USR process, therefore, includes highlighting the parts of SR's definition that affect management (Vallaeys, 2007). The problems that require shared SR as part of the solution are connected to systemic questions arising from the social routines of a multitude of people living together, which have impacts that frequently remain invisible if they are not examined by researchers (Vallaeys, 2014a).

According to Vallaeys (2007), universities have to manage four impacts in a socially responsible way, which can be placed along two axes: organisational and academic (Vallaeys, 2014b). The organisational axis contains internal impacts (i.e. labour and environmental) and the opposing external impacts (i.e. labour and environmental). The academic axis — the factor that differentiates USR from CSR — comprises educational impacts (i.e. teaching and/or student training) and the opposing cognitive impacts (i.e. epistemology and research) (Vallaeys, 2014b).

Universities' educational services have a direct impact on the teaching and/or training of young people and professionals, including their values scale, way of understanding, interpreting and evaluating the world and behaviours towards the surrounding environment (Vallaeys, 2007; Vallaeys et al., 2009). HEIs also influence professional ethics, consciously or unconsciously, and the definition of each curricular unit's professional ethics and social role. Thus, responsible universities question what type of professionals, citizens and individuals these institutions train and how they can organise education programmes appropriately to ensure students' socially responsible education (Vallaeys et al., 2009).

This education's impact should include empowering teachers to clarify the meaning of USR and to promote learning through specialised subjects based on social projects. HEIs must encourage the creation of learning workshops and more interaction between disciplines because of the need for a multi- and interdisciplinary approach to dealing with social problems, as well as more extensive overlap between teaching, research and social projects (Vallaeys, 2008).

Concerning universities' cognitive and epistemological impacts, these institutions guide the production of knowledge and technology, influence the definition of what is socially designated as truth, science, rationality, legitimacy, usefulness, teaching and other values. Conversely, HEIs promote the democratisation of science and influence the definition and selection of problems on scientific agendas (Vallaeys, 2008). Therefore, responsible universities monitor the type of knowledge they produce and its relevance to students and other communities (Vallaeys et al., 2009) in order to promote research contributing to development in all possible ways.

HEIs' social impacts, in turn, affect society and its economic, social and political development. Socially responsible HEIs ask how they can accompany society's development and how they can help solve its fundamental problems (Vallaeys et al., 2009).

USR's goal is to develop interfaces between research centres and lecturers from various departments to implement and manage development projects that can offer teaching resources and applied research to communities (Vallaeys, 2008). A combination of social outreach, teaching and research can produce a significant increase in student volunteerism since students are able to benefit from learning based on projects associated with their training (Vallaeys, 2008).

Finally, universities' internal management or organisational functioning, similar to any organisation's effect on its labour force, has an impact on the lives of non-teaching staff, lecturers, researchers and students, which these HEIs' social action policies shape. Additional impacts are seen on environmental pollution such as decreased waste, deforestation and atmospheric pollution caused by traffic (Vallaeys et al., 2009). Universities leave a 'footprint' on the people who use their facilities, as well as having an 'ecological footprint' (Vallaeys, 2008).

The goal is to guide these effects in order to transform HEIs into small but exemplary democratic communities characterised by fairness, which eliminates segregation and privileges and encourages political and economic transparency. In addition, universities need to be models of sustainable development, including, among others initiatives, environmental protection policies, recycled paper and waste treatment. To this end, pertinent tools can be applied that are already used by firms to achieve higher quality levels, such as the Social Accountability 8000 Standard or social balance ideals (Vallaeys, 2014a). To make universities socially exemplary communities, students need to take advantage of a dual source of learning, acquiring knowledge related to their required courses and learning from their university about good citizenship habits and values (Vallaeys, 2014a).

The literature highlights that these impacts and their underlying theoretical models (Vallaeys, 2007) are not designed to be rigid or definitive but instead to serve as an inspiration so that each university can plan its own SR strategies in accordance with its identity, history and context (Vallaeys et al., 2009). HEIs should, therefore, carry out analyses before drafting and defining strategies that lead to competitive advantages, as well as assessing the risks inherent in decision making. Responsible organisations are conscious of what they do, avoid potentially adverse events, remain vigilant and take precautions to avoid regrettable results. No organisation is immune to the danger of having a negative impact on its social and environmental contexts (Vallaeys, 2014a).

SR is thus not a function of organisations but rather a permanent way of controlling all functions based on accurate diagnoses and good management of direct and indirect impacts (Vallaeys et al., 2009). Given the above research, the following research hypotheses were formulated for the present study:

H1. Perceived educational, cognitive, organisational and social impacts directly influence general perceptions of USR.

H1a. *Perceived educational impacts directly influence general perceptions of USR.*

H1b. *Perceived cognitive impacts directly influence general perceptions of USR.*

H1c. *Perceived social impacts directly influence general perceptions of USR.*

H1d. *Perceived organisational impacts directly influence general perceptions of USR.*

2.2. Service quality

The subject of universities' service quality has been studied in general as a result of the initiatives of these institutions' main stakeholders (De Jager and Gbadamosi, 2010). More specifically, research on this topic has been conducted in the United Kingdom (e.g. Telford and Masson, 2005), Portugal (e.g. Oliveira-Brochado and Marques, 2007), Germany (e.g. Voss et al., 2007), China and Hong Kong (e.g. Kwan and Ng, 1999), South Africa (e.g. De Jager and Gbadamosi, 2010) and Spain (e.g. Vázquez et al., 2014). Thus, knowledge about this extremely important dimension of HEIs is currently increasing (Rowley and Moldoveanu, 2003). Notably, the definition of higher education customers includes not only students but also non-teaching staff, lecturers, governments, families and society at large, which means universities must satisfy a vast range of needs (Abdullah, 2006).

DiDomenico and Bonnici (1996) argue that HEIs need to analyse the quality of the services they provide in order to function efficiently and effectively in highly competitive environments. In addition, universities should strive to define strategies oriented towards satisfying all their customers' needs. Unlike many other organisations' services, higher education services are continuous and long-term. In addition, students' cognitive participation is essential in HEIs, and these customers' needs are met by different types of service providers (Subrahmanyam, 2017).

Academic institutions' services also differ from other professional services because HEIs' programmes play a central role in students' lives as these individuals require extensive motivation, competencies and intellectual skills to attain their objectives (Gruber et al., 2010; Subrahmanyam, 2017). Students' motivation is vital to getting them involved and ensuring their long, continuous educational process is successful (Gruber et al., 2010). This is a cyclical process because HEIs' quality services motivate students to participate more fully in educational processes, which, in turn, improves the quality of educational results (Subrahmanyam, 2017).

Various studies have been inspired by the growing importance of SR in organisational practice (e.g. Luo and Bhattacharya, 2006; Vázquez et al., 2014). These have found that SR programmes' implementation has a significant influence on a range of results related to customers, particularly in terms of their perceptions of service quality. In addition, some studies (e.g. Vázquez et al., 2014, 2016) indicate that universities' efforts to promote SR is one factor that can positively influence HEI students' perception of service quality. This finding underlines the usefulness of paying more attention to teaching USR, including environmental and social values and their application in research, internal management and external projects. Based on the above research, an additional research hypothesis was developed for the present study:

H2. *General perceptions of USR directly influence perceived service quality.*

2.3. University students' satisfaction

In this context, student satisfaction plays a crucial role in universities' success (Abdullah, 2006), and the concept of satisfaction has been extended to evaluations of higher education services. Students' satisfaction with the quality of services provided by these institutions has been studied by numerous researchers (e.g.

Douglas et al., 2006; Alves and Raposo, 2007). Various studies have confirmed that HEI students' perceived service quality is an antecedent of their satisfaction (e.g. De Jager and Gbadamosi, 2013; Vázquez et al., 2014, 2016; Vallaeys, 2016), so a consensus can be found among researchers regarding the causal order between these two constructs.

In higher education contexts, more recent studies (e.g., Sultan and Wong, 2013) have validated the existing theoretical frameworks (Burrows, 1999) with regard to stakeholders (e.g. customers, employees, competitors and communities) and confirmed that students are HEIs' most significant stakeholders. Thus, classifying students as customers of higher education service providers is not a new approach. Kuh and Hu (2001) suggest that students are the higher education sector's main customers and partners as they consciously choose and purchase university services. In addition, Elliott and Healy (2001) argue that students' satisfaction is a short-term attitude and a result of their experiences with educational services. According to Sapri et al. (2009), students' satisfaction plays an important role in determining HEI services' precision and authenticity.

According to Helgesen and Nesset (2011), customer loyalty is often perceived to be the main consequence of customer satisfaction. The cited authors confirmed that this satisfaction has a positive and significant influence on loyalty (Athiyaman, 1997). The connection between students' satisfaction and loyalty has also been confirmed in higher education contexts (e.g. Helgesen and Nesset, 2011; Arif and Ilyas, 2013).

Regarding the relationship between service quality and satisfaction, the earliest studies sought to determine the relationship's direction, namely, if service quality leads to satisfaction or vice versa (Parasuraman et al., 1985; Cronin and Taylor, 1992). After the conceptual framework and empirical evidence were strengthened, numerous authors (e.g. Carrillat et al., 2007; Vázquez et al., 2014, 2016; Annamdevula and Bellamkonda, 2016) came to consider service quality to be an antecedent of customer satisfaction. Therefore, students' positive perceptions of service quality are expected to have a significant influence on their satisfaction (Alves and Raposo, 2010).

However, the debate continues as to the best way to define service quality in higher education contexts (Becket and Brookes, 2006), with quality in higher education defined differently depending on which stakeholders experience different HEI services. As students are the principle stakeholders in any HEI (Sultan and Wong, 2013), their interactions with the services provided during their student years can be aggregated to form service quality (Jancey and Burns, 2013).

Various theories also relate SR to clients' perceptions of satisfaction. The first is perceived value theory (Mithas et al., 2005), which states that customers obtain satisfaction through assessments of an aggregate set of value attributes connected to services. SR increases customers' perceived value through firms' participation in socially responsible initiatives. The second is equity theory (Galbreath and Shum, 2012), which points out that, in social exchange theory, individuals become satisfied when they receive appropriate treatment in terms of equity or justice. This includes the ethical treatment of customers and employee training, which has positive implications for companies' fair treatment of customers. The third is institutional theory (Daub and Ergenzinger, 2005), in which customers are not only considered economic-financial beings but also members of a larger community. Thus, customers are concerned about both their consumption experiences and commercial operations' impacts on the environment and society. The last is corporate identity theory (Lichtenstein et al., 2004), which highlights that positive brands create an identity that improves customers' assessment of the companies' service. SR

is seen as an alternative form of branding service performance in ways that customers can identify with more closely (i.e. develop a feeling of connection).

In summary, customers obtain better perceived value and, consequently, greater satisfaction with products or services when these are provided by socially responsible companies (Luo and Bhattacharya, 2006). Therefore, increased knowledge about customers' expectations is another antecedent to improved satisfaction (Mithas et al., 2005), with the latter being strengthened by SR initiatives or programmes.

Given the above research, the following hypotheses were formulated for the present study:

H3. *General perceptions of USR directly influence satisfaction.*

H4. *Service quality directly influences satisfaction.*

H5. *The influence of general perceptions of USR on satisfaction is mediated by service quality.*

The research model was developed based on the information presented in the previous sections (see Fig. 1).

3. Methodology

3.1. Data collection and sample

This study relied on a semi-structured, self-reported questionnaire to collect data. The instrument was translated and adapted from Vázquez et al.'s (2014, 2016) work and administered via an online platform, LimeSurvey, between 6 and April 10, 2017. The respondents were students in their third year of first cycle degree and integrated master's degree programmes, as well as students in the second cycle and master's components of integrated master's degree programmes at the University of Trás-os-Montes and Alto Douro. This sample population was selected in order to cover a range of students' perceptions of and views on USR.

The questionnaire contained sociodemographic questions and a set of 46 items associated with USR, which were subdivided into 4 dimensions corresponding to Vallaeys's (2008) 4-impact model (i.e.

educational, cognitive, social and organisational). The scale thus included 12 educational items, 10 cognitive items, 12 social items and 12 organisational items, whose composition was based on the above literature review and similar instruments (Vallaeys et al., 2009; Burcea and Marinescu, 2011; Kleinrichert et al., 2011; Vallaeys, 2014a). The questionnaire also included a global index formed of 3 questions related to students' general perceptions of USR (Elkington, 1997) and a group of 6 items associated with student satisfaction (Andreassen and Lindestad, 1998; Johnson et al., 2001). A final group of 5 items assessed HEI service quality (Vázquez et al., 2014). Except for the sociodemographic questions, all items' responses used a 5-point Likert scale.

The final sample was made up of 903 valid questionnaires from a total of 3563 students. The respondents were in their third year of a first cycle degree or integrated master's degree programme and the first and second years of the second cycle degree programme. This sample corresponds to a response rate of 25% (see Table 1).

3.2. Data analysis

To evaluate the constructs' psychometric validity, the first exploratory step was to determine whether the 46 items associated with USR impacts converged on the proposed factors. To this end, exploratory factor analysis was carried out using the factor extraction method of principal components with varimax rotation. The items were found to converge on the respective factors, so they could be grouped into the 4 impacts suggested by the literature (Vallaeys, 2008; Vallaeys et al., 2009).

Next, confirmatory factor analysis was performed with the 46

Table 1
Representativeness of sample.

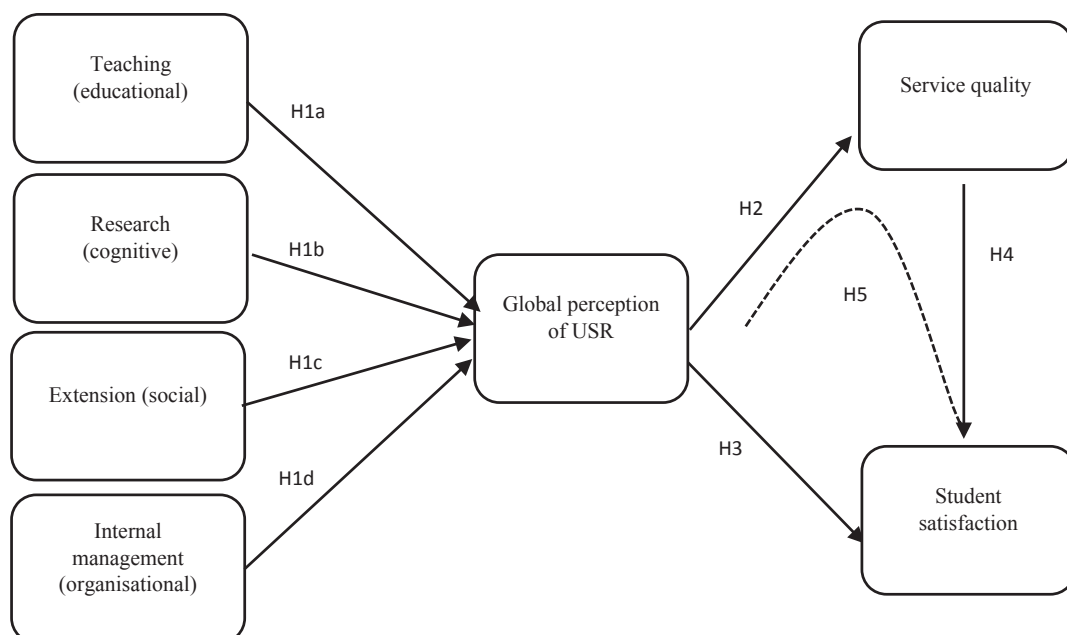|	N	%
Population	3563	100
Total questionnaires filled in	1419	40
Total incomplete questionnaires	470	13
Total complete questionnaires	949	27
Valid questionnaires	903	25

Note: N = number.

Fig. 1. *Conceptual research model.*

items of USR by applying the maximum likelihood estimation method and using adjustment quality indices and respective reference values described by Hair et al. (2009). These included chi-square/degrees of freedom (χ^2/gl), CFI, GFI, PCFI, PGFI, RMSEA, P (RMSEA $\leq$ 0.05) and MECVI. The quality of local adjustment was assessed by the factor weights, and the modification indices were analysed when the model did not present good data adjustment.

In addition to determining the overall quality of adjustment, the constructs' reliability and validity were assessed. To determine reliability, composite reliability (CR) (Fornell and Larcker, 1981) was used as this is an alternative measure of reliability particularly suitable for use in factor analysis, thereby confirming the constructs' adequate reliability (CR $\geq$ 0.7). Regarding factor validity, all the items presented factor weights above 0.5, indicating that the four factors present acceptable validity. For convergent validity, the average variance extracted (AVE) of all 4 constructs was calculated, confirming that the AVE values obtained were above 0.5 and thus verifying suitable convergent validity.

The remaining constructs (i.e. global USR index, satisfaction and service quality) were subjected to the same procedure as the four impacts. However, the choice was made to present some of the data related to the three constructs when determining the proposed model's measurement model, which corresponded to confirmatory factor analysis with all the constructs included in the final model. Briefly put, the data were processed using a structural equation model (SEM) using IBM's AMOS v. 24 software, to test the proposed research model. This study thus sought to validate an explanatory model of USR, with the University of Trás-os-Montes and Alto Douro as the unit of analysis, and to determine USR's influence on students' perceived service quality and satisfaction.

4. Presentation of results

4.1. Characterisation of sample

The final sample is mainly students enrolled in a first degree (54.6%) or master's degree (28.7%) programme. Most respondents (68.3%) were in their third year of a first cycle or integrated master's degree programme, with 23.5% in their first year of a master's — or the equivalent year in an integrated master's degree programme. Female students predominate (60.5%), and the most represented age groups are respondents who were 20 (19.7%) or 21 years old (19.9%) and those between 24 and 29 years old (19.9%)

4.2. Structural equation analysis of proposed model

This subsection describes how the model based on the previously discussed theoretical framework was created. The SEM was developed into two submodels, corresponding to two stages. The first was the measurement submodel corresponding to the confirmatory factor analysis, which defined how the hypothetical constructs or latent variables are operationalised by the observed or manifest variables. The second was the structural submodel, which defined the causal — or any associated — relationships between the latent variables.

These analyses were carried out according to the previously mentioned adjustment quality indices and respective reference values discussed in Hair et al. (2009). The quality of local adjustment was assessed via the factor weights and the items' individual reliability, while the causal paths' significance was assessed with a Z-test of the critical ratios. The relative normed fit index (RNFI) was also calculated by following Mulaik et al.'s (1989) guidelines, in order to assess the global structural model's quality. Paths with $p < 0.05$ were considered significant.

4.2.1. First stage: Measurement submodel

The original measurement submodel included 7 factors. Four factors corresponded to the 4 proposed USR dimensions and the remaining 3 factors were global perception of USR, service quality and student satisfaction.

The model was adjusted to fit the data collected from 903 students, showing satisfactory adjustment quality however after the factor weights, items' individual reliability and modification indices were analysed, some of their errors were correlated in order to improve the model's adjustment. The adjusted model (χ^2/gl = 3.111; CFI = 0.952; GFI = 0.829; PCFI = 0.881; PGFI = 0.742; RMSEA = 0.048; P [RMSEA $\leq$ 0.05] = 0.962; MECVI = 6.107) presented a slight improvement in adjustment compared with the original (χ^2_{dif} (51) = 3758.717), as well as a lower MECVI (6.107 vs 10.153).

After the evaluation of global adjustment quality, the constructs' reliability and validity were assessed. To determine reliability, CR was used confirming adequate construct reliability (CR $\geq$ 0.7) with all constructs presenting CR values above 0.89. The constructs also have adequate Cronbach's alphas (α) with all values over 0.9 (see Table 3). As for factor validity, all items presented factor weights above 0.5, so all 7 constructs of the model have factor validity. For convergent validity, all 7 constructs' AVE was calculated, which confirmed that their AVE values are above 0.54 (>0.5) and thus indicated suitable convergent validity (see Table 3).

4.2.2. Second stage: Structural submodel

Concerning the model's adjustment, besides the indices mentioned previously, the models' RNFI was 0.994, which is so close to 1 that it indicates almost perfect adjustment. An analysis of the paths between the factors revealed that two paths between the USR dimensions and global perception of USR are statistically significant at a 1% level in a bilateral test. These are the paths of the dimensions corresponding to cognitive ($\beta_{\text{USR\_Global.Inv}}$ = 0.419; $p < 0.001$) and educational ($\beta_{\text{USR\_Global.Ens}}$ = 0.259; $p < 0.001$) impacts. The Internal management→Global perception of USR path, which corresponds to organisational impacts ($\beta_{\text{USR\_Global.GestInt}}$ = 0.127; $p = 0.030$), is also statistically significant but at a lower level. Finally, the Extension to the community→Global perception of USR path associated with social impacts ($\beta_{\text{USR\_Global.Inv}}$ = −0.013; $p = 0.836$) is not significant.

However, the Global perception of USR→Service quality path is also statistically significant at 1% ($\beta_{\text{Qual.USR\_Global}}$ = 0.910; $p < 0.001$), as is the Global perception of USR→Student satisfaction path ($\beta_{\text{Sat.USR\_Global}}$ = 0.171; $p = 0.002$). Notably, the latter path — besides the direct effect mentioned above — has a significant indirect or mediated effect through the service quality factor ($\beta_{\text{Sat.USR\_Global|Qual}}$ = 0.686; $p < 0.001$), with this indirect effect being substantially greater than the direct effect. In addition, the Service quality→Satisfaction path is statistically significant at 1% ($\beta_{\text{Sat.Qual}}$ = 0.753; $p < 0.001$). Fig. 2 shows the hypotheses tested and their respective regression coefficients and statistical significance, with paths with $p < 0.05$ being considered significant.

Table 3
Reliability (CR and Cronbach's α) and convergent validity (AVE) of model constructs.

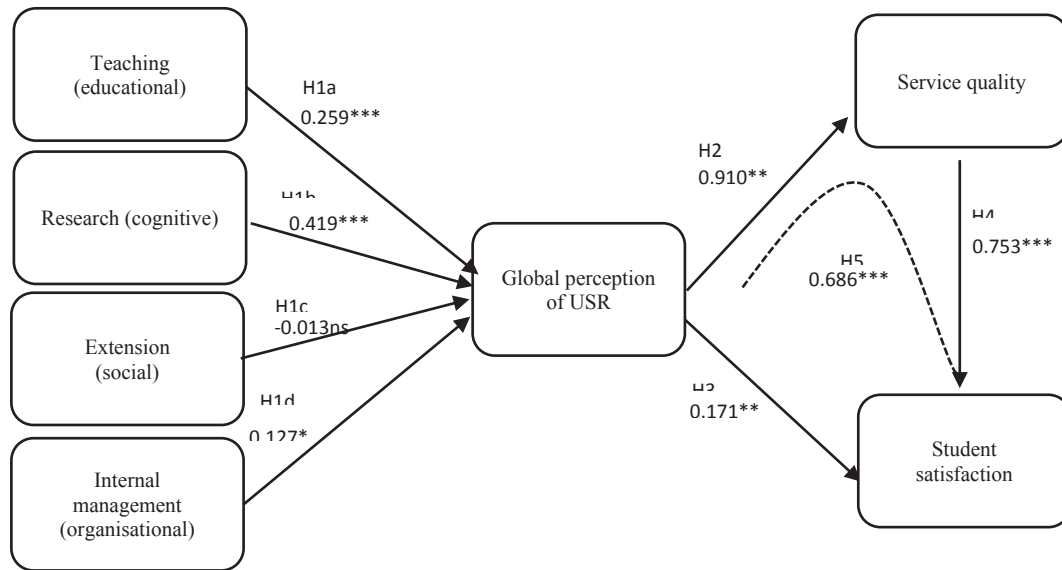| Construct	CR	α	AVE
USR (educational impacts)	0.956	0.959	0.543
USR (social impacts)	0.973	0.974	0.753
USR (organisational impacts)	0.972	0.973	0.747
USR (cognitive impacts)	0.979	0.979	0.821
USR (global index)	0.949	0.948	0.861
Satisfaction	0.963	0.964	0.814
Service quality	0.894	0.944	0.629

Fig. 2. Assessment of conceptual model
Note: ***$p < 0.001$; ** $0.001 \leq p < 0.010$; * $0.010 \leq p < 0.050$; [ns] $p \geq 0.050$.

Table 4 summarises the results for the hypotheses. The paths associated with each hypothesis are listed, as well as whether they are supported.

5. Discussion of results

Regarding students' perceptions (see Table 4 above), all USR impacts are significant except for social impacts (i.e. extension to the community), so only one hypothesis (H1c) is not supported by the data. The inference can thus be made that H1 is overall partially supported. All the constructs are valid, but no convergence was found with USR's extension or social impact.

The support found for H1's assertions about the paths related to USR's impacts (i.e. teaching, research, extension and internal management) on students' global perception of USR confirms that students are happy with their university. The respondents appreciate their HEI and believe it has a strong potential in terms of contributions to solving social problems, enhancing growth and economic development and fostering respect for, and protection of, the environment. Only Vázquez et al. (2014, 2016) have previously conceptualised these paths (i.e. six types of impacts), so the relationships between USR dimensions and student satisfaction have not been defined in other research, which underlines the significance of the present findings.

As for USR's educational or teaching impact (H1a), students stress that curricula have been adapted to meet the needs and demands of different economic sectors and that their university is concerned about fostering human and social values and promoting citizenship. In addition, the respondents report that the university invests in grants, subsidies and study awards and that graduates are offered the practical training and help needed to enter the labour market. These results are in line with studies by Vallaeys (2007), Vallaeys et al. (2009), Peet et al. (2004), Ceulemans and De Prins (2010) and Lozano and Young (2013), among others.

In relation to H1b, the results confirm that USR's cognitive or research impact (H1b) affects students' perception that their HEI values the production of scientific knowledge that solves social and environmental problems. The respondents also believe their university integrates the principles of respect for individual and social rights into any scientific research projects developed, as well as gathering scientific knowledge necessary to address social and environmental problems. The students further highlight the HEI's innovative projects that respect the environment and create sustainable economic value. These results are in agreement with Vallaeys (2008), Ferrer-Balas et al. (2009), Goodnough et al. (2009) and Geng et al.'s (2013) research.

Regarding the path of USR's social or extension impact on the global perception of USR (H1c), this relationship was not statistically supported. Thus, students do not appear to know about any collaborations between their university and firms, public services and/or non-governmental organisations in social assistance projects or the sponsorship and organisation of events promoting local and regional socioeconomic development. These results do not corroborate Ferrer-Balas et al.'s (2009) study.

Table 4
Analysis of hypotheses.

Hypotheses (paths)	β	p	Hypothesis supported?
H$_{1a}$: Teaching (educational)→Global perception of USR	0.259***	<0.001	Yes
H$_{1b}$: Research (cognitive)→Global perception of USR	0.419***	<0.001	Yes
H$_{1c}$: Extension (social)→Global perception of USR	−0.013[ns]	0.836	No
H$_{1d}$: Internal management (organisational)→Global perception of USR	0.127*	0.030	Yes
H$_2$: Global perception of USR→Service quality	0.910***	<0.001	Yes
H$_3$: Global perception of USR→Student satisfaction	0.171**	0.002	Yes
H$_4$: Service quality→Student satisfaction	0.753***	<0.001	Yes
H$_5$: Global perception of USR→Student satisfaction (mediated)	0.686**	<0.001	Yes

Note: ***$p < 0.001$; ** $0.001 \leq p < 0.010$; * $0.010 \leq p < 0.050$; [ns] $p \geq 0.050$.

Concerning USR's organisational or internal management impact (H1d), students believe that the university selects goods and services based on responsible and sustainable criteria, allocating its resources rationally and efficiently. This includes promoting a balance between teaching and non-teaching staff's work and family life, as well as enhancing their professional development and continuous training. The respondents also stress the quality of the university's activities within the institution, which corroborates the findings reported by Ferrer-Balas et al. (2009), Vallaeys et al. (2009), Geng et al. (2013) and Vallaeys (2014a, b).

Hypothesis 2 postulates a path from a global perception of USR to service quality in students' perceptions. The data collected shows the university has high-quality academic programmes, and lecturers seek to strengthen the quality of their performance. These findings are only corroborated by Vázquez et al.'s (2014; 2016) studies since the path from global USR to service quality is an emerging topic.

With regard to Hypothesis 3's statement about global perception of USR's impact on student satisfaction, the respondents feel they made the right decision in choosing to pursue their education in their particular HEI. The students are so satisfied with their academic experiences that they would recommend this university to others. The respondents share a feeling of pride in belonging to the institution. As with the previous hypothesis, these results are in agreement only with Vázquez et al.'s (2014; 2016) work, undoubtedly because the link between USR and student satisfaction is a recent topic.

Hypothesis 4 states that service quality influences student satisfaction. That is, when students recognise the quality of university services, this functions as an antecedent of these individuals' satisfaction. The current finding corroborates the results reported by De Jager and Gbadamosi (2013), Vázquez et al. (2014, 2016) and Vallaeys (2016). Hypothesis 5 also was supported by the present study's results, in which the impact of global USR on student satisfaction is strongly mediated by service quality.

In summary, this research confirmed that Vallaeys's (2007) four-impact model adequately identifies students' perceptions of USR, but, as Vallaeys et al. (2009) suggest, these impacts are not rigid or definitive. They are meant to serve as a framework to inspire all universities to plan their own SR strategies.

6. Conclusions

This study developed a model for assessing USR, which was adapted for use in Portuguese universities. The research involved testing USR's impacts on service quality and student satisfaction. The model was found to be statistically robust, thereby corroborating that the four impacts proposed by Vallaeys (2008) as USR dimensions are antecedents of service quality and student satisfaction in higher education. The present study contributes to filling some gaps about determine students' perception of USR in an HEI: first, a scale of USR was validated (students' perceptions of HEIs' SR activities) and can be replied in others HEI; second, deepens knowledge about the application of corporate SR (CSR) in educational contexts − we must understand the significance of USR to HEIs' competitiveness; and third, analysed the relationship between perceptions of USR, service quality and student satisfaction − students are the main actors in HEI, academic initiatives seldom seek to meet students' expectations and needs in relation to SR programmes, and our study do that.

Overall, the results for the construct of global perception of USR show that the students surveyed feel their university has strong potential in terms of contributing to solving social problems. Regarding the specific USR impacts, the findings include that students perceive that cognitive impacts, namely, HEI research initiatives, contribute the most to USR. This, therefore, confirms that students recognise that their university produces scientific knowledge that can solve social and environmental problems, as well as developing innovative projects that respect the environment.

Nevertheless, the results obtained for social impacts highlight the need for more internal communication with students in order to publicise and disseminate information about — and above all involve students in — activities reaching out to the surrounding community. In addition, the current findings emphasise that students believe a global perception of USR has an extremely significant effect on the quality of HEI services, and this impact plays a dominant mediating role in students' satisfaction.

Notably, the respondents' university specifically seeks to provide a 'green' campus, including creating the largest botanical garden in the Iberian Peninsula. The slogan of this HEI's 2013−2017 strategic plan was 'Towards an Eco-university', which demonstrates the university's strategic concern about the environment and sustainability. It should also be noted that in the current UTAD strategic plan, 2017−2021, a commitment to achieving the Sustainable Development Goals is explicit. Thus, as general commitments, transversal to the Sustainable Development Goals, we highlight: the reinforcement of the internationalization component of the knowledge produced by UTAD, which is reflected in several SDGs, associated with the mechanisms of dissemination and promotion of good practices of open science and knowledge sharing; the inclusion of Agenda (2030) and the SDGs in the curriculum of the various courses taught by UTAD; strengthening UTAD's role as a vehicle and promoter of Agenda (2030) in the context of its relations with the community, business and public or private entities. This shows that strategies targeting these areas foster a reputation as a responsible university, influencing students' perception positively and, in turn, promoting service quality and student satisfaction.

These findings' implications include the validation of the proposed model as a useful tool for universities since HEIs can focus on conducting assessments of students' perceptions of these universities' SR policies, given that these perceptions are an antecedent of service quality and student satisfaction. This will, therefore, allow HEIs to enhance their definition of grounded strategies and evidence-based USR. Universities should also reformulate their mission and strategy so that SR becomes a central pillar, thereby facilitating the involvement of all stakeholders, especially students and staff. In terms of university management, the present results underline the importance of defining a communication strategy to involve different internal stakeholders, particularly students, more deeply in the area of university extension projects linked with a more sustainability development (social, environmental) that are very relevant for the young generation and future HEI students.

One of the limitations of this research is that the model was only applied to one public university, so future studies will need to apply the model to other national and international HEIs to gain a better understanding of USR as an antecedent of service quality and student satisfaction. Further research also should take into consideration cultural differences, countries and regions' economic and social development stages and issues related to religion and ethnicity. In addition, longitudinal analyses would be fundamental to establishing stronger causal interpretations of the links between global perceptions of USR and student satisfaction, as well as the value of universities' strategic initiatives meant to attract and retain students.

Declaration of competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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