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The influence of cultural intelligence on intention of internet use

La influencia de la inteligencia cultural en la intención de uso de internet

Influence of
cultural
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Abstract

Purpose – Each culture is defined by norms, beliefs and values which influence and complicate individual thoughts and actions. Cultural intelligence (CQ) is a novel concept that reflects the ability of individuals of certain cultures to adapt to the general conditions of a different society. This study aims to explore the relationship between CQ and technology adoption in the form of intention to use the internet.

Design/methodology/approach – This quantitative empirical study, based on data from a questionnaire completed by 201 university students, proposes three models to analyse the direct, indirect and moderating influence of the CQ on intention to use the internet.

Findings – The study reveals that CQ has an indirect influence on the intention to use the internet.

Originality/value – Most research to date has focused on analysing the influence of CQ in the cross-cultural field. This work contributes to the development of the concept of CQ as a decisive factor in a globalised world and analyses its impact on the internet, a tool that is fundamental at all levels.

Keywords Cultural intelligence, Technology acceptance, Culture, Internet

Paper type Research paper

Resumen

Propósito/objetivo – Cada cultura posee unas normas, creencias y valores que la definen, lo que influye en el pensamiento y acciones de los individuos que la componen y dificulta el ajuste entre las mismas. Derivado de esto, la inteligencia cultural (CQ) es un concepto novedoso que refleja la capacidad que tienen los individuos de una determinada cultura de adaptarse a las condiciones generales de otra sociedad

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diferente. En este estudio, se explora la relación existente entre la CQ y la adopción tecnológica en la intención de uso de Internet.

Diseño/metodología/planteamiento – La muestra está conformada por 201 estudiantes universitarios y los datos fueron recolectados a través de cuestionario. Se realizó un estudio empírico cuantitativo, proponiéndose tres modelos para analizar la influencia de manera directa, indirecta y como factor moderador de la CQ sobre la intención de uso de Internet.

Conclusiones – El estudio revela que la CQ influye indirectamente sobre la intención de uso de Internet.

Aportaciones – La mayoría de las investigaciones hasta el momento se han centrado en analizar la influencia de la CQ en el ámbito cross-cultural. Este trabajo contribuye al desarrollo del concepto CQ como un factor decisivo en el mundo globalizado y analiza su impacto en una herramienta fundamental a todos los niveles como Internet.

Palabras clave – Inteligencia cultural, Aceptación tecnológica, Cultura, Internet

Tipo de artículo – Trabajo de investigación

1. Introduction

Globalisation is an international phenomenon that affects technological, economic, political and cultural exchanges between nations, organisations and individuals (Curry, 2000). Globalisation for markets has led to the disappearance of a number of barriers between countries and cultures promoting an exchange of goods and services (Friedman and Beláustegui, 2006). The spread of technologies such as the internet abets this phenomenon (Yip and Dempster, 2005). The expansion of the globalised economy has generated the need to understand the similarities and differences of consumers from different cultures (Yoo *et al.*, 2004) as individuals of different countries bear different characteristics determined by their culture. Previous research on this question reveals that obviating these differences can lead to failed international business projects (Goodrich and De Mooij, 2011; Ricks, 2009). Consequently, globalisation implies that businesses, and above all individuals, take into account cultural difference to cope with new environments and conditions. The expression “culture”, more specifically its dimensions (Hofstede, 1980; Hofstede *et al.*, 2010), facilitate its understanding and measurement and serves as a fundamental tool to establish comparisons between countries. In addition, in numerous studies cultural dimensions in different countries play a key role in adopting innovations and technology (Hofstede and Bond, 1988; Shore and Venkatachalam, 1996; Steenkamp *et al.*, 1999; Steers *et al.*, 2008; Van Everdingen and Waarts, 2003).

Moreover, each culture possesses its own characteristics that influence the behaviour of its individuals (Hofstede *et al.*, 2010). Therefore, businesses and individuals must identify these differences by integrating themselves into foreign social, economic and living conditions. Following this rationale, Early and Ang (2003) developed the concept of cultural intelligence (CQ from the English acronym cultural quotient) which is defined as the ability of an individual to relate and develop successfully in a foreign cultural environment.

Although a great amount of research correlates cultural dimensions with the adoption of technology, there is, to date, no study delving specifically into the influence of CQ on technology adoption. Yet there are common characteristics inherent to certain cultures marked with a CQ that predisposes them toward a greater acceptance of technology. Therefore, the objective of this research, founded on the previous notion, is to prove through several models the relationship between CQ and technological acceptance to identify the influence of CQ on the intention to adopt the internet.

2. Literature review

2.1 Culture

To understand consumer behaviour of it is necessary to understand the term “culture” as the underlying key and differentiating feature of individual behaviour (Steenkamp, 2001). Cultural norms and beliefs are forces that influence and shape individual perceptions, dispositions and behaviours (Markus and Kitayama, 1991). Hofstede defines culture as “the collective programming of the mind which distinguishes the members of one human group from another” (Hofstede, 1991, p. 5). A number of authors have attempted to analyse the dimensions that make up culture (McCort and Malhotra, 1993). It is, nonetheless, the framework developed by Hofstede (1980, 1984, 2011) that has gained the most support in research on the field of cultural dimensions (Soares *et al.*, 2007; Triandis, 1990, 1993).

Hofstede’s original cultural framework comprised four dimensions: power distance, individualism/collectivism, masculinity/femininity and uncertainty avoidance (Hofstede, 1980). In a subsequent review of his own research, this specialist included a new dimension labelled long-term vs short-term orientation (Hofstede, 1991). Ultimately, in 2010, Hofstede added a sixth and final dimension known as indulgence vs restraint (Hofstede *et al.*, 2010). These dimensions are described in Tables I.

2.2 Cultural intelligence

Culture influences the behaviour of the individuals that make up a society (De Mooij, 2010). Individuals who grow up in different countries develop different modes of behaviour and thinking (Hofstede *et al.*, 2010). Therefore, if cultural norms develop differently in different parts of the world, problems arise during the interaction of members of different cultures (Adair *et al.*, 2006). Determining why certain individuals integrate better than others in different cultural contexts has become an important objective in education, selection of personnel and prevention of social conflict (Earley, 2002; Erez and Earley, 1993). Hence the importance of the concept of cultural intelligence (CQ) which is defined as the ability of

Cultural dimensions	Description
Power distance	Reflects the inequality of power and the relationships of authority and hierarchy in a society (Hofstede <i>et al.</i> , 2010). It reveals how members of a society observe the inequality of power in institutions and organisations (De Mooij and Hofstede, 2002; Hofstede, 1980; 1984; 2001; Hofstede <i>et al.</i> , 2010)
Individualism vs collectivism	Describes the relationships of individuals of each culture with respect to their group. These relationships are more independent in individualistic societies and more united in collectivist societies (Hofstede, 1984; Lu <i>et al.</i> , 1999)
Masculinity vs femininity	Hofstede (1998) considers this dimension as the degree to which values associated with the role of the male prevail over those of the female (e.g. quality of life)
Uncertainty avoidance	A great indicator of this dimension is reflected by a low tolerance toward uncertainty and a rule-oriented society. On the other hand, low aversion to risk is linked to a more flexible and open society (Armstrong, 1996; De Mooij and Hofstede, 2002; Hofstede, 1984)
Long-term vs short-term orientation	This dimension is based on the confrontation of a long-term orientation linked to a dynamic and future-oriented culture to a more static and traditional short-term culture (Hofstede, 2001)
Indulgence vs restraint	A highly indulgent society allows gratification of desires and emphasises leisure. On the other hand, restrictive societies regulate and control satisfaction by means of strict social norms (Hofstede, 2011)

Table I.
Hofstede’s cultural
dimensions

individuals to adapt to culturally different environments based on individual learning and experience (Şahin *et al.*, 2014). This therefore shows that cultural dimensions can be dealt with at the individual level. Along this line of thought, some authors establish that Hofstede’s dimension of individualism/collectivism (Hofstede, 1980) can be treated at the individual level (Kim *et al.*, 1994; Triandis, 1994; Yamaguchi *et al.*, 1995). Table II describes the four components of CQ (Early and Ang, 2003).

2.3 Cultural dimensions and cultural intelligence

Individuals are members of a particular culture which affects their attitudes and behaviours (Hofstede *et al.*, 2010) hindering integration and adjustment into different societies (Triandis, 1989). The basis of the differences between cultures originates from an inescapable reality that all human beings are *ethnocentric* (Triandis *et al.*, 1990), that is, they firmly believe that what is “normal” in their culture should be normal elsewhere. Hence, an individual from one culture that tries to integrate into another will encounter difficulties and probable dissatisfaction (Mendenhall and Oddou, 1985; Triandis, 2006). This situation highlights the importance of the acquisition of CQ skills so as to enable individuals to adapt more effectively to foreign environments (Bhaskar-Shrinivas *et al.*, 2005; Şahin *et al.*, 2014).

2.4 Main approaches to the analysis of technology acceptance

The use of information and communication technologies is currently increasing, bolstered by the competitiveness of a globalised environment (Venkatesh *et al.*, 2016). But for these technologies to contribute to business performance, employees must accept and apply them (Venkatesh *et al.*, 2003). For authors like Davis (1989), this acceptance is based on two factors. The first is utility, understood as the perception of individuals that a technology will lead to better work performance. The second relates to the question of ease of use linked to the amount of effort invested in efficiently adopting a certain application. Research in this

CQ components	Description
Meta-cognitive	Factor regarding an individual’s level of cultural awareness during a cross-cultural interaction (Early and Ang, 2003). This component therefore reflects the mental processes carried out by individuals to acquire and understand foreign cultural knowledge. Individuals with a high meta-cognitive component question their own cultural assumptions and adjust their knowledge to that of other cultures (Early and Ang, 2003)
Cognitive	Reflects knowledge of the norms, practices and conventions of different cultures acquired through education and personal experience (Early and Ang, 2003). This factor also includes self-knowledge of a context and influences the thoughts and behaviour of people (Ang and Van Dyne, 2015). Hence individuals with a high cognitive level are more apt to interact with individuals from a society of a different culture as they understand its essential facets (Early and Ang, 2003)
Motivational	Manifests the ability to direct attention and energy toward acquiring and functioning in situations characterised by cultural differences (Early and Ang, 2003). The motivational component is a source of action that increases the effort and energy directed toward functioning in new cultural environments
Behaviour	Reflects the ability to exhibit appropriate actions when interacting with individuals from different cultures (Early and Ang, 2003). Hence, individuals with a high behavioural component are flexible and can adjust their behaviour to the specific characteristics of each cultural interaction (Early and Ang, 2003). An ability to show a flexible range of behaviour is necessary to create positive impressions and develop intercultural relations (Gudykunst <i>et al.</i> , 1988)

Table II.
CQ Components

field has given rise to several theoretical models originating in the disciplines of psychology and sociology (Venkatesh and Davis, 2000). These models offer clues as to the factors that influence the decision to adopt and use a technology and lead to understanding how individual reactions can predict real use of a specific technology (Venkatesh *et al.*, 2003).

The technology acceptance model (TAM) (Davis, 1989) is one of the most widely accepted models by the specialised literature. The TAM was designed to predict the acceptance of information systems by users in organisations (Venkatesh *et al.*, 2003). According to Davis (1989, 1993), the main objective of this model is to explain the factors that determine the use of a technology by a large number of individuals. Moreover, it suggests that its two main constructs, utility and ease of use, are fundamental in individual intention to use a technology. The authors of a revised version of this model, labelled TAM2 (Venkatesh and Davis, 2000), propose the inclusion of a series of antecedents, not present in the original version, based on processes of social influence.

The changes that take place at the technological level and their speed of application, lead to the need to review and establish a synthesis of the established models to move toward a unified vision of the acceptance of technology (Venkatesh and Davis, 2000). The TAM model and its revision (TAM2) offer a basic structure to observe the impact of a series of external variables on the intention to use a technology (Venkatesh *et al.*, 2003). Advances in this field have led to the inclusion of additional external variables that may affect user acceptance of a technology. Venkatesh *et al.* (2003), along this line, propose the unified theory of acceptance and use of technology “UTAUT”, a model that advances four antecedents of intention to use:

- (1) effort expectancy associated with the degree of ease of use of the technology on the part of the consumers;
- (2) performance expectancy that reveals the extent of the benefits of using a technology when carrying out an activity;
- (3) social influence, which reflects the perception among consumers on how people important to them (e.g. friends and family) consider a particular technology; and
- (4) facilitating conditions, which values the resources needed to support the technology.

Subsequently a further UTAUT2 model was developed with the intention of adapting the original UTAUT model from an organisational to a consumption environment (Venkatesh *et al.*, 2012). This extension of the model analyses the acceptance of internet by users of mobile devices, adding an additional three constructs:

- hedonic motivation, which concerns the fun and pleasure derived from the use of a technology;
- the value of the price, linked to the economic cost of using a technology; and
- habit, considered as the degree to which users tend to carry out behaviours automatically as a result of previous experiences.

Among the antecedents of intention to use gathered in the UTAUT and UTAUT2 models, effort expectancy and performance expectancy have been proven in the literature to be key predictors in the acceptance of technology (Al-Awadhi and Morris, 2008; Hsiao and Tang, 2014; Im *et al.*, 2011; King and He, 2006; Oh *et al.*, 2009; Venkatesh *et al.*, 2016). Hence according to Im *et al.*, “The most important part of the UTAUT model is the relationships between use intention and two independent constructs – performance expectancy and effort expectancy” (Im *et al.*, 2011, p. 3).

2.5 Culture and technology

International transfer of technology is influenced by cultural factors (Gales, 2008; Steenkamp *et al.*, 1999; Steers *et al.*, 2008). This influence, in turn, is determined by cultural dimensions at the moment of technology adoption (Kedia and Bhagat, 1988; Van Everdingen and Waarts, 2003). Societies with high levels of individualism, low power distance, low aversion to risk and indulgence present characteristics such as freedom, taste for risk, independence, adaptability, propensity to change, pursuit of objectives, assertiveness or importance of leisure that relate them positively with technological acceptance (Gales, 2008; Hofstede, 2011; Kedia and Bhagat, 1988; Khan and Cox, 2017; Syed and Malik, 2014; Van Everdingen and Waarts, 2003). Collective, risk-averse and restrictive societies, with a high level of power distance, by contrast, are not prone to technological adoption as they are characterised by rigidity, hierarchy, respect for traditions, aversion to change or existence of strict norms (Hofstede, 2011; Hofstede and Bond, 1988; Steenkamp *et al.*, 1999; Zmud, 1982). The findings of the literature review highlight that the characteristics of cultural dimensions such as flexibility, autonomy and amenity to risk are linked positively to acceptance of technology, as well as being inherent to individuals with a high level of CQ. Hence, based on the above, flexibility, adaptability and perseverance are requirements needed to adjust satisfactorily to new cultural environments (Ang and Van Dyne, 2015; Early and Ang, 2003). Moreover, these values coincide with cultures known to possess greater levels of reception to technology (Gales, 2008; Van Everdingen and Waarts, 2003).

The characteristics of individualistic cultures (Table III) that positively affect technological acceptance coincide with high levels of CQ (Ang and Van Dyne, 2015; Triandis, 2006). Individuals with high CQ require the constant remodelling of the concept of self to understand a new cultural scenario, as the interpretation of new environments may require abandoning established preexisting conceptions (Ang and Van Dyne, 2015; Early and Ang, 2003). A certain flexibility is therefore necessary to assume behaviours that offer positive impressions and develop significant intercultural relationships (Bhaskar-Shrinivas *et al.*, 2005).

As listed in Table III, the characteristics of cultures that are not averse to risk that can enhance the acceptance of technology (Shore and Venkatachalam, 1996) are linked to fundamental characteristics of high CQ such as flexibility. CQ is measured according to the ability to adapt to culturally different environments based on learning and individual experience (Şahin *et al.*, 2014). Therefore, there can be a positive relation between CQ and

Cultures (Hofstede, 2011)	Characteristics linked to high CQ	Technological innovation and adoption	Authors
Individualistic	Flexibility, independence and liberty	Positive influence	Gales (2008), Kedia and Bhagat (1988), Van Everdingen and Waarts (2003)
No aversion to risk	Assumption of risks, flexibility and tolerance	Positive influence	Shore and Venkatachalam (1996)
Lower power distance	Independence, autonomy and decentralisation	Positive influence	Gales (2008), Mumford and Licuanan (2004)
Long-term oriented	Personal persistence and adaptability	Positive influence	House <i>et al.</i> (2004), Van Everdingen and Waarts (2003)
Short-term oriented	Prone to accept change and new ideas	Positive influence	Gales (2008)
Indulgence	Liberty	Positive influence	Khan and Cox (2017), Syed and Malik (2014)

Table III.
CQ, Cultural dimensions and technology adoption

adoption of innovations as individuals with high CQ experience higher levels of general adjustment in conditions of uncertainty such as a foreign cultural environments (Templer *et al.*, 2006). This taste for uncertainty is also presented by businesses that are not averse to risk and are more prone to adopt innovations and technology. Furthermore, acceptance of a new technology can be considered as a type of investment that requires adapting to conditions of uncertainty (Stoneman, 2001). Cultures with a low power distance present values such as autonomy and lack of rigidity associated both with greater technological acceptance (Mumford and Licuanan, 2004) and high levels of CQ (Early and Ang, 2003; Templer *et al.*, 2006). Indulgent societies observing values such as freedom, pursuit of leisure or entertainment (Hofstede, 2011) are associated with higher levels of technological acceptance (Khan and Cox, 2017; Syed and Malik, 2014) and share common characteristics of CQ such as freedom (Ang *et al.*, 2007).

The relationship between cultures with long-term or short-term orientation and technological acceptance is unclear (Table III). Authors such as Van Everdingen and Waarts (2003) and House *et al.* (2004) argue that the greater a country's long-term orientation, the higher the rate of adoption of innovations. Erumban and De Jong (2006) and Gales (2008) advance the opposite, that short-term oriented societies are more prone to change and adopt new ideas (Gales, 2008). As to masculinity, the relationship is not clear, according to Erumban and De Jong (2006) masculinity has no influence on technological acceptance. Steenkamp *et al.* (1999), on the other hand, argue that masculinity positively influences adoption of innovation given that male societies are oriented toward achievement, success, rewards, training and individual improvement, factors linked to innovative organisations (Hofstede, 2001). As has been proven, certain characteristics such as personal adaptability and persistence combined with a higher rate of technological adoption (Van Everdingen and Waarts, 2003) are also related to CQ. Moreover, the literature review indicates that characteristics such as flexibility, autonomy or decentralisation inherent to cultures with low aversion to risk marked individualism, indulgence and a low power distance are concomitant with high quotas of technology and innovation acceptance (Erumban and De Jong, 2006; Van Everdingen and Waarts, 2003). Based on the above, it is not surprising to detected a connection with the characteristics that define high CQ. Table III summarises the characteristics and common values of CQ and its cultural dimensions indicative of a positive relation with technological acceptance.

3. Models proposal

Three models based on the literature review are advanced so as to first determine the influence of CQ on the intention to use the internet and subsequently specify which is the best model. For an individual to act efficiently in culturally diverse situations, he/she must understand the culture and its characteristics as norms or expressions associated with cognitive intelligence and must be motivated to achieve the goal in the form of a response to a foreign cultural environment. Therefore, it is essential to master high levels of the four CQ factors to acquire cultural intelligence (Earley and Peterson, 2004; Ang and Van Dyne, 2015) as the four factors are interrelated (Kanfer and Heggestad, 1997). In line with this notion, it is reasonable to assume a global influence of CQ on the variables linked to the intention to use the technology (Earley and Peterson, 2004; Ang and Van Dyne, 2015).

3.1 Model 1. Influence of cultural intelligence on the intention to use through effort expectancy and performance expectancy

The literature review indicates that an individual with high level of CQ re-examines his/her own mental maps to increase their precision so as to understand new environments (Ang and Van Dyne, 2015; Earley, 2002) and facilitate interactions and the exchange of information

which leads to a better performance of tasks when facing different cultures (Li *et al.*, 2012). Characteristics such as utility, motivation or performance at work that are linked to a high CQ (Early and Ang, 2003) are, in turn, linked to performance expectancy. In addition, other processes such as comprehension or learning reflected in the cognitive and motivational component of CQ are included in the effort expectancy (Venkatesh *et al.*, 2003, 2012).

A high CQ reflects knowledge of the norms, practices and conventions of different cultures acquired through education and personal experience and requires constant remodelling and adaptation to grasp a new scenario or framework (Ang and Van Dyne, 2015; Early and Ang, 2003). This leads to a link between learning and knowledge to performance expectancy which, according to Venkatesh *et al.* (2003), englobes the notions of technological complexity and ease of use. Motivation is another important factor of CQ reflecting the capacity to direct attention and energy toward learning and functioning in situations characterised by cultural differences, besides facilitating the achievement of goals (Kanfer and Heggstad, 1997). The latter is related to performance expectancy because of the efficiency and utility of applying a technology in achieving objectives or its use in the work place (Davis, 1989; Venkatesh *et al.*, 2016; Zhou *et al.*, 2010).

As noted by Early and Ang (2003), CQ provides an effective response to situations of cultural diversity. It is also aimed at an achievement reflected in an aspect of behaviour of CQ (Ang *et al.*, 2007; Ang and Van Dyne, 2015) linked to performance expectancy as individuals seek to obtain a return and benefit through the use of technology (Venkatesh *et al.*, 2012). It is therefore reasonable to assume that CQ is indirectly related to the intention to use through its antecedents (effort expectancy and performance expectancy). Likewise, it is necessary to develop the relationship and influence that effort expectancy has over performance expectancy as the effort to use a technology is reflected in the expected output and in the perceived utility on behalf of individuals (Venkatesh and Davis, 2000). These notions lead to the following research hypotheses:

- H1a.* CQ has an indirect and positive influence on the intention to use through its antecedents of effort expectancy and performance expectancy.
- H1b.* Effort expectancy has a direct and positive influence on performance expectancy (Figure 1).

3.2 Model 2. There is a direct influence of cultural intelligence on intention to use

As proposed in the previous paragraphs, individuals benefitting from CQ reveal more ease in interacting with members of a different society as they understanding its fundamental parts and are, a priori, in a better position to perceive the usefulness of a technology.

Yet it must be taken into account that CQ is a source of action which increases the effort to respond efficiently to foreign cultural environments (Early and Ang, 2003; Templer *et al.*, 2006). There is thus a relation between CQ and expectancy that act as antecedents of intention to use since, if an individual is endowed with a motivational component, he/she is predisposed to use of technology. Considering the above, in the framework of the relationships advanced in the previous model, there would exist, besides an indirect influence of CQ through the antecedents of intention to use, a direct relationship between CQ and the intention to use:

- H2.* CQ has a direct and positive influence on intention to use (Figure 2).

3.3 Model 3. The moderating effect of cultural intelligence in the relationship between effort expectancy and performance expectancy and the intention of using the internet

The previous models suggest both an indirect and a direct influence of CQ on the intention to use a technology (internet). Taking into account the influences of the

moderating variables such as age, gender, experience and willingness to use in both the UTAUT and UTAUT2 models (Venkatesh *et al.*, 2003, 2012), it is reasonable to raise the moderating effect of CQ on the relationship between performance expectancy and effort expectancy and the intention to use the internet. Hence, they could serve as a response to the following question: Can CQ act as a moderating variable between performance and effort expectancy on intention to use? (Figure 3)

4. Methodology

4.1 Sample design and data collection

Data collection was carried out during the months of April and June 2016 by means of a questionnaire developed with the Google forms tool. It was filled out by university students by email and through the social network Facebook. The sample population consisted of 201 individuals. Their sociodemographic figures are summarised in Table IV.

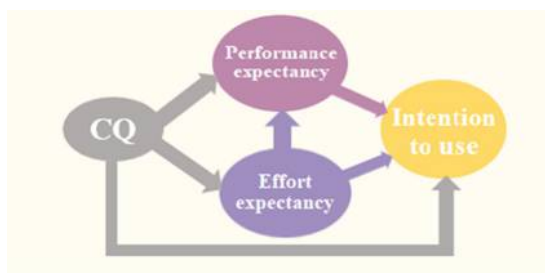
4.2 Measurement scales

All the scales were measured by means of a seven-point Likert scale (1: totally disagree – 7: totally agree). A filter question related to the use of the internet was introduced at the outset of



Note: Indirect influence of CQ on the intention to use through its antecedents (performance expectancy and effort expectancy)

Figure 1.
Model 1



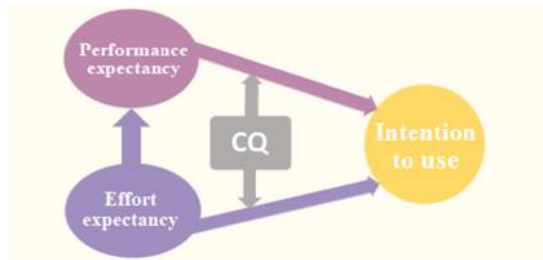
Note: Direct influence of CQ on the intention to use and its indirect influence through its antecedents (performance expectancy and effort expectancy)

Figure 2.
Model 2

the questionnaire and a series of questions referring to the participant's socio-demographic profile were placed at its end. The scale to measure CQ is that developed by [Ang et al. \(2007\)](#) comprising 20 items and contrasted by authors such as [Moon \(2010\)](#) and [Ward et al. \(2009\)](#). The current study (see [Appendix](#)) adapted this scale by applying 18 of the 20 initial items with the four intelligence factors of CQ. The scale serving to measure effort expectancy and performance expectancy and the intention to use a technology (see [Appendix](#)), in turn, is based on the UTAUT and UTAUT2 models ([Venkatesh et al., 2012](#)).

5. Results

The study evaluated the three models by means of the AMOS version 23.0 software. CQ was deemed as a second order variable in the first two models and as a moderating variable in the third. The final model distinguished between individuals with a high level of CQ from those with low level. The median served to divide the sample.



Note: CQ acts as a moderating variable in the relationship between effort expectancy and performance expectancy on intention use

Figure 3.
Model 3

Characteristics	Category	(%)
Gender	Male	53.74
	Female	46.26
Age	18 to 29	38.07
	30 to 44	43.57
	45 to 60	18.36
	Other	0.99
Level of education	No studies	0.99
	Primary school studies	3.48
	Secondary school studies	11.93
	University studies	74.69
	Other	8.91
Employment	Employed	57.33
	Unemployed	13.30
	Student	20.66
	Domestic work	3.21
	Retired	3.21
	Other	2.29

Table IV.
Sociodemographic characteristics of the sample

5.1 Analysis of the validity of the measurement scales

The evaluation of the validity of the measurement model began by calculating the standard coefficients of the three models that reveal values greater than 0.7. Nonetheless, those with values equivalent to a p -value of 0.001 are considered more significant.

The reliability of the different constructs was measured by Cronbach's alpha test which yielded values greater than 0.70 (Hair *et al.*, 1999). In terms of internal consistency, the values of composite reliability were greater than 0.70 and those of average variance extracted greater than 0.50 (Table V).

5.2 Measurement model fit

The main types of goodness of fit measures listed in Table VI served to evaluate the adequacy of the matrix reproduced in each of the models. Based on the characteristics of the sampling distribution, the values of the normed chi-square test were selected as the first indicator as they reveal that the parameters of the three models are within the levels recommended by the literature to reflect a good fit. The GFI indicator is less responsive to deviations of normality than that of the chi-square (Luque, 2012) as the three models show a coefficient index of 0.8, a value approaching the level of 0.9 recommended by the literature (Hair *et al.*, 1999). The RMSEA value, in turn, indicates a good fit for M1 of 0.07 and of 0.07 for M2. Yet the value of 0.09 for M3, on the other hand, is not below the recommended maximum value of 0.08. ECVI and NCP are among the most useful absolute fit indexes for comparing models with the best being that with the lowest value (Luque, 2012; Hair *et al.*, 1999). The first two models, M1 and M2, reveal similar approaches of comparison with the first (M1) with lower ECVI (4.07) and NCP (344.03) index values. The values of another fit index (RMR) listed in Table VI indicate that the M3 at 0.21 is the poorest fit model.

Considering all the indicators, M1 is the model with the best overall fit. M3, on the contrary, is the worst fit model as it does not comply with the minimum values recommended by the RMR and RMSA indicators and obtains the worst normed chi-square test value (2.79). As for the indicators of the incremental fit indices (Table VI), the CFI and the IFI of the three models offer acceptable or high values of fit around 0.9, as well as being near those recommended for the RFI indicator (0.9). M1 and M2 show identical values for these indicators, while those of M3 are poorly fitting.

Finally, the parsimony fit indices of PNFI, AIC and CAIC, similar to those of absolute fit (ECVI and NCP) noted above, are useful for comparing alternative models (Hair *et al.*, 1999). M1 and M2 are similar because of their structure as M1 shows the lowest AIC (815) and CAIC (1094.74) values, thus has the best parsimony fit (Luque, 2012). The other parsimony fit indices of M3, PGFI (0.55) and PNFI (0.69), offer values that are far from the recommended value of 1 (Luque, 2012). These indicators therefore connote that M1 is the most parsimonious and best fit of the three, in addition to being the most adequate to represent the relationship between CQ and technological acceptance. Table VI lists an overview of the fit indices of the three models.

5.3 Analysis of the models

The results indicate that M1 is the best model to represent the influence of CQ on the intent to use the internet. Table VII lists the standardised coefficients and the level of significance of the three models. The coefficients denote that the relationship between CQ and the *effort expectancy* of M1 (0.64 and $p = 0.00$) and M2 (0.64 and $p = 0.00$) is significant, whereas the opposite is the case of the variable between CQ and *performance expectancy* as to M1 ($p = 0.30$) and M2 ($p = 0.36$). The relationship between *effort expectancy* and *performance*

Table V.
Composite reliability
and average variance
extracted of the
models

FACTORS	Cronbach's alpha	Composite reliability		AVE		Composite reliability		AVE M3		Composite reliability		AVE M3	
		M1	M2	M1	M2	M3 Group high CQ	M3 Group low CQ	Group high CQ	Group low CQ	M3 Group low CQ	Group high CQ	Group low CQ	
Meta-cognitive CQ	0.88	0.88	0.88	0.66	0.66	-	-	-	-	-	-	-	-
Cognitive CQ	0.87	0.87	0.87	0.58	0.57	-	-	-	-	-	-	-	-
Motivational CQ	0.89	0.89	0.89	0.64	0.64	-	-	-	-	-	-	-	-
Behavioural CQ	0.89	0.89	0.89	0.68	0.68	-	-	-	-	-	-	-	-
Performance expectancy	0.88	0.89	0.89	0.72	0.72	0.78	0.78	0.54	0.54	0.95	0.95	0.87	0.87
Effort expectancy	0.94	0.94	0.94	0.78	0.78	0.86	0.86	0.62	0.62	0.96	0.96	0.87	0.87
Intention to use	0.85	0.88	0.88	0.71	0.71	0.73	0.73	0.51	0.51	0.92	0.92	0.81	0.81

Table VI.
Fit indices

Measurements of fit	Indicators	M1	M2	M3
Absolute fit indices	Chi-square (df.; p -value)	685.03 (341;0.00)	684.56 (340;0.00)	200.03 (72;0.00)
	Normed chi-square	2.00	2.01	2.79
	RMR	0.09	0.09	0.21
	RMSEA	0.07	0.07	0.09
	NCP	344.03	344.56	127.03
	GFI	0.80	0.80	0.80
	ECVI	4.07	4.08	1.40
Incremental fit indices	AGFI	0.75	0.75	0.75
	CFI	0.92	0.92	0.90
	NFI	0.86	0.86	0.85
	IFI	0.92	0.92	0.90
Parsimony fit indices	RFI	0.84	0.84	0.82
	PNFI	0.77	0.77	0.69
	PGFI	0.67	0.66	0.55
	AIC	815	817	275
	CAIC	1094.74	1100.58	-

Table VII.
Relationships subject
to analysis in the
models

Relationships	M1	M2	M3 high CQ	M3 low CQ
CQ → Effort expectancy	0.64; $p = 0.00$	0.64; $p = 0.00$	-	-
CQ → Performance expectancy	0.10; $p = 0.30$	0.09; $p = 0.36$	-	-
Effort expectancy → Performance expectancy	0.75; $p = 0.00$	0.76; $p = 0.00$	0.69; $p = 0.00$	0.86; $p = 0.00$
Effort expectancy → Intention to use	0.14; $p = 0.30$	0.12; $p = 0.36$	0.00; $p = 0.96$	0.11; $p = 0.44$
Performance expectancy → Intention to use	0.79; $p = 0.00$	0.79; $p = 0.00$	0.77; $p = 0.00$	0.82; $p = 0.02$
CQ → Intention to use	-	0.04; $p = 0.56$	-	-

expectancy is significant and positive for the three models. The relationship between *effort expectancy* and the *intention to use*, on the contrary, is not significant in any of the three models. The relationship between *performance expectancy* and the *intention to use* the internet is significant in M1, M2 and M3 in both groups of individuals, with high and low CQ. M2, revealing a direct relationship between CQ and the *intention to use*, indicates that this second model is not significant (0.04 and $p = 0.56$).

The objective of the current research is to examine the relationship between CQ and technological acceptance in the form of intention to use the internet. M1, based on the indicators, is proven to be the best fit model reflecting this relationship. Table VIII, in

Table VIII.
Indirect effects of M1

Relationships	Indirect effect
CQ → Effort expectancy	-
CQ → Performance expectancy	0.48 $p = 0.00$ (0.31;0.67)
CQ → Intention to use	**0.56 $p = 0.00$ (0.33;0.71)
Effort expectancy → Performance expectancy	-
Effort expectancy → Intention to use	0.59 $p = 0.00$ (0.39;0.90)
Performance expectancy → Intention to use	-

Note: Significant coefficients ** $p < 0.01$

turn, indicates the indirect and significant influence of CQ on intention to use (with a coefficient of 0.56 and $p = 0.00$). Hence H1a obtains empirical support and CQ positively influences intention to use through effort expectancy and performance expectancy. Moreover, the relationship posed in H1b between effort expectancy and performance expectancy is direct and positive as the coefficient (0.75) obtained empirical support. H2, nonetheless, proposing a direct and significant relationship between CQ and the intention to use (M2), as evidenced by the data of Table VII, does not obtain empirical support as it presents a non-significant coefficient (0.04). Therefore, CQ does not directly influence intention to use. M3, where CQ is considered a moderating variable of the relationships between the antecedents of the intention to use and this construct, indicates that the moderating effect is significant but contrary to what was proposed. The relation is weaker in individuals considered to possess high CQ than in those with low CQ due, as revealed by the indicators of Table VI, to the fact that the levels of overall fit and parsimony are not acceptable.

6. Conclusion

CQ is considered a very important subject of research in the field of intercultural contact (Sharma and Hussain, 2017). Moreover, several authors confirm how it directly affects businesses and their employees when adapting to different cultural environments (Early and Ang, 2003; Templer *et al.*, 2006; Triandis, 2006). The adjustment that organisations and employees must assume when in new cultural environments is essential for success in international projects. Failing to adapt can lead to the collapse of a business project or employee dissatisfaction and stress resulting from lack of adapting to foreign cultural conditions. As CQ represents the ability of individuals to adapt to situations of cultural diversity, high CQ leads to success (Early and Ang, 2003).

From a theoretical point of view, this study proposes a relationship between CQ and acceptance of a technology, a notion heretofore absent in previous studies given that most CQ research so far has focused on analysing its influence in cross-cultural spheres (Ang and Van Dyne, 2015; Early and Ang, 2003).

This study, by contrast, examines CQ influence on intention to use the internet and proposes three models to analyse its effects. The results point to a direct and significant CQ influence on effort expectancy. This is evidenced by factors such as learning and knowledge inherent to CQ that are linked to the perceived difficulty of use of a technology. However, CQ does not directly influence performance expectancy while it does, in turn, indirectly influence effort expectancy. This is because of the fact that the effort to use a technology is reflected in the individual expected outcome and perceived utility (Venkatesh and Davis, 2000). On the other hand, performance expectancy directly and significantly influences the intention to use the internet, in line with the results of previous studies on technological acceptance (Im *et al.*, 2011; Venkatesh and Davis, 2000; Venkatesh *et al.*, 2016). Yet effort expectancy does not have a significant influence on intention to use as indicated by Carter *et al.* (2011) and Venkatesh *et al.* (2003). These authors argue that the relationship is only significant in the early stages of technology adoption. This would not be the case of the internet which is already widely used throughout society. CQ, by contrast, moderates the relationship between the expectations of effort and performance with intention to use, while the effect is contrary to that expected because of the unsatisfactory level of fit of the third model and the sample size.

Success in business in the twenty-first century therefore depends on the way individuals and organisations acquire and put into practice cross-cultural sensitivity and their ability to

interact efficiently with people of different cultures (Harris, 2004). As stated by Goh (2012), CQ is indispensable in the current world and necessary for the development of any globalised nation. CQ helps individuals develop in increasingly cosmopolitan environments with practical implications linked to technology as information technologies such as the internet have become essential to international business success. Hence, companies must take into account both the ability of their clients and the ability of their employees to adjust to different cultural environments. They must also dedicate a great amount of effort in raising the CQ level among employees to achieve commercial success and be competitive globally because of the growth in international business practices and the increase of employee background diversity. Cultural diversity between service providers and consumers adds complexity in a multicultural environment. Understanding and adjusting to these differences therefore facilitates economic and commercial exchange. Derived from the above, this research examines the influence of the concept of CQ on the intention to use a technology.

There are certain limitations that should be highlighted. Given the importance of the concept of CQ, future research, for example, should apply the model to specific cases. Moreover, the size of the sample of the current study is not very large, a deficiency that future research should correct. Future studies should also take into account other variables such as experience, personality and gender that could have an influence on the link between CQ and the acceptance of technology.

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Appendix. Items serving for the study

CQ factor	Items
Meta-cognitive CQ	MC1: I am aware of cultural differences when I interact with people from other cultures MC2: I adapt my cultural knowledge when I interact with people from unfamiliar cultures MC3: I am aware of cultural knowledge and I apply it in multicultural situations MC4: I can assess my cultural knowledge when I interact with people from different cultures
Cognitive CQ	COG1: I know the legal and economic systems of other cultures COG2: I know the rules (vocabulary, grammar, etc.) of other languages COG3: I know the values and religious beliefs of other cultures COG4: I know the arts and folklore of other cultures COG5: I know the rules of expression and non-verbal behaviour of other cultures
Motivational CQ	MOT1: I enjoy interacting with people from different cultures MOT2: I am confident that I can socialise with locals in a culture that is unfamiliar to me MOT3: I am sure I can deal with the stresses of adapting to a new culture MOT4: I enjoy living in cultures that are unfamiliar to me MOT5: I am sure I can adapt to the living conditions of a different culture
Behavioural CQ	BEH1: I use pauses and silences differently when adapting to cross-cultural situations BEH2: I vary my rate of speaking when a cross-cultural situation requires it BEH3: I change my nonverbal behaviour when a cross-cultural situation requires it BEH4: I alter my facial expressions when a cross-cultural interaction requires it

Table AI.
CQ Measurement scale

Constructs	Items
Performance expectancy	PE1: I find the Internet useful in my daily life PE2: Use of the Internet helps me accomplish things more quickly PE3: Use of the Internet increases my productivity
Effort expectancy	EE1: Learning how to use the internet is easy for me EE2: My interaction with the internet is clear and understandable EE3: I find the Internet easy to use EE4: It is easy for me to be proficient in the use of the Internet
Intention to use	IU1: I intend to continue using the internet in the future IU2: I always try to use the internet in my daily life IU3: I intend to continue using the internet frequently

Table AII.
Scale of measurement of acceptance of technology

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