ICT Acceptance Among University Teachers: A Cross-Cultural Comparison Between China and Spain

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1.- Theoretical Framework

Nowadays, the presence of ICTs in university classrooms is already a consolidated reality in developed countries, with a growing number of technologies at the disposal of teachers thanks to the rapid technology development.

Consequently, administrations have set in motion different programs aiming for the incorporation of these new devices to the classrooms with different success rates (Gil-Flores, Rodríguez-Santero, & Torres-Gordillo, 2017; Sánchez-Prieto, Olmos-Migueláñez, & García-Peñalvo, 2014).

One of the essential factors to ensure the success of the technology integration process is having the collaboration of the teachers. Therefore, the knowledge of the variables that can affect their decision of incorporating a new device to their teaching practice constitutes a fundamental tool for the design of effective initiatives for the promotion of technology integration in higher education contexts (Sánchez, Marcos, González, & GuanLin, 2012).

In the educational field, there is a growing number of researches that propose the use of technology adoption models for the study of the factors that condition ICT acceptance among teachers both in Asian and European contexts (Aljuaid, Alzahrani, & Islam, 2014; Kiraz & Ozdemir, 2006; Koutromanos, Styliaras, & Christodoulou, 2014). However, the number of studies that explore the technology adoption process from a cross-cultural perspective is still in an initial stage of development (Tarhini, Hone, & Liu, 2014).

National and organizational cultural values have a strong influence on the views and opinions of individuals, and they can affect the influence of the factors that condition the intention of using ICTS as didactic tools. This influence may explain some of the inconsistencies found in the research of the adoption process (Tarhini et al., 2014).

Although we can find some examples of Cross-Cultural studies focused on the effect of culture on the technology adoption process of the educational agents (Arenas-Gaitán, Ramírez-Correa,

& Javier Rondán-Cataluña, 2011), there is still a lack of studies focused on higher education teachers' acceptance, and none to the extent of our knowledge that offers a comparative of the technology acceptance of higher education teachers in countries of the Latin-European cluster and those in countries of the Confucian-Asian cluster (Gupta, Hanges, & Dorfman, 2002).

Therefore, the aim of this study is to analyse the influence of cultural factors on the technology acceptance of University teachers of China and Spain by answering the following research question: *Is there any difference between China and Spain in the level of acceptance of ICTs among university teachers?*

In order to answer the research question, we have designed a questionnaire based on two widely-accepted theories for the study of technology adoption and culture. The technology acceptance model (TAM) (Davis, 1989) and Hofstede's cultural values (Hofstede, 1980). This questionnaire was administered digitally to university teachers of the two countries obtaining a combined sample of 830 university teachers selected by accessibility.

Below, following the proposed structure, we will detail the methodology and the results obtained of the descriptive analysis and the hypothesis contrast.

2.- Methodology

As mentioned above, the design of the model for this study is based on the technology acceptance model proposed by Davis (1989). This theory, based on the TRA (Theory of Reasoned Action) (Fishbein & Ajzen, 1975), intends to explain the adoption process using a model composed of four constructs: perceived usefulness (PU), perceived ease of use (PEU), the attitude (AU) of the individual towards the use of the tool, and the behavioural intention (BI) which measures the strength of the disposition of the individual to use the technology.

TAM constitutes the most popular theory for the study of the technology adoption and is frequently modified through the addition of constructs from other theories to increase its explanatory power or adapt it to new contexts (King & He, 2006).

In this research, the TAM model has been expanded with a construct that measures the constructivist teaching beliefs (CTB) of the teachers. This factor has been previously used in studies on technology acceptance and is considered an antecedent of the behavioural intention to use technologies (Sang, Valcke, Braak, & Tondeur, 2010; Teo, Huang, & Hoi, 2017; Sánchez-Prieto, Olmos-Migueláñez, & García-Peñalvo, 2017).

Secondly, to characterize the cultural values of the sample of teachers from the two countries we used Hofstede's cultural values, including the following dimensions based on the analysis of the Chinese and Spanish samples by Hofstede, Hofstede and Minkov (2010): individualism/collectivism (IC), uncertainty avoidance (UA), power distance (PD) and indulgence (I).

Hofstede's cultural values are one of most cited frameworks for the analysis of cultures and have been incorporated in studies focused on the acceptance of technology developed within the educational field, confirming its effect on the technology acceptance of the users (Tarhini et al., 2014)

This way, the instrument is divided in two sections. The first one is dedicated to gathering the identification data of the teachers (country, gender and age), and the second one is composed of a Likert-type scale of 41 items that measures the abovementioned dimensions. The internal

consistency of the instrument was confirmed through the use of Chronbach's alpha coefficient, which yielded values over 0.7 in both scales for the two samples.

The Chinese sample is composed by 426 university teachers, 42.3% male and 56.8% female with an average age of 38.47 years. The Spanish sample is composed by 404 university teachers 62.1% male and 37.9% female, the average age of the Spanish sample is 46.97 years.

3.- Results and Discussion

Firstly, the results obtained in the analysis of the items from Hofstede's cultural values dimensions show significant differences between the two countries, with mean scores higher in the Chinese sample in the majority of the items. For the hypothesis contrast we selected Mann-Whitney's U as a statistic after confirming the lack of normality in the distribution of the two samples through the tests of Kolmogorov-Smirnov and Shapiro-Wilk (s.l. 0.05). The results of Mann-Whitney's U confirm that there are significant differences in 15 out of the 18 items that measure the cultural values (s.l. 0.05). The teachers that compose the Chinese sample are more collectivistic, with a slightly higher tolerance to uncertainty and a higher power distance between the groups. However, the indulgence was similar between the two samples.

Secondly, the analysis of the items from the variables that compose the expanded TAM model also shows important differences between the samples of the two countries. The results of Mann-Whitney's U verify that these differences are statistically significant in 14 out of 23 items (s.l. 0.05).

On the one hand the Spanish university teachers perceived that the ICT are easier to use, and they have a more positive attitude towards the use of ICTs in education and a higher intention to use them. On the other hand, Chinese university teachers have stronger constructivist teaching beliefs, with higher mean scores in four of the seven items.

In conclusion, the results of this research show that there are significant differences at an indicator level in both the cultural values and the acceptance of ICTs of the university teachers of China and Spain that participated in the study. This demands further research to deepen in the relationship between cultural differences and ICT acceptance among university teachers.

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