

Research Article

Evaluation of the Success of an Academic Portal: An Exploratory Study of the Staff's Perspective

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Abstract

This paper discusses the findings of an exploratory study that intended to evaluate the success of an Academic Portal, Secretaria Online, from the perspective of staff members. This study used a questionnaire based on the information systems success model of DeLone and McLean. This paper presents the consolidated results of the answers from 109 staff members (93 faculty and 16 non-faculty staff). The results of this study allow us to understand the critical role of Secretaria Online in ISCAP's activities; however, they also show that several aspects need to be improved.

Keywords: Academic Portal, Information Systems, Success, Evaluation

Introduction

With the evolution of information technology Higher Education (IT), Institutions (HEIs) have invested in the development of websites, often referred to as Academic Portals, to achieve strategic benefits, namely, greater efficiency and effectiveness in the management of students' and employees' information, as well as better quality services for stakeholders (Rakemane & Serema, 2018; Semeon et al., 2010). These Academic Portals are interactive tools that aim to facilitate communication among the

academic community and provide helpful content and services (Al-Debei, 2014).

The role played by academic portals is increasingly crucial in HEIs, since they need integrated information systems that support all their functions and activities, which allows them to operate efficiently, make informed decisions and offer the best educational experience to students (Lupu et al., 2018). Thus, keeping these information systems up to date is essential, so the search for changes and improvements is continuous. Given this context, HEIs have invested heavily in

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creating and updating their Academic Portals (Mukerjee, 2012).

Given the importance and role of Secretaria Online (as an Academic Portal) in supporting the activities of the Instituto Superior de Contabilidade e Administração do Porto (ISCAP), it was considered relevant to conduct a study to assess the success of Secretaria Online adoption by the (teaching and non-teaching) staff. This paper presents the initial results of the assessment carried out by the staff of ISCAP, using DeLone and McLean's model of information systems success.

Following this introduction section, this paper discusses the importance of information systems success and presents DeLone and McLean's model of information systems success. Then, are presented the research approach and the main results. This paper ends with final considerations about this research.

Information Systems Success

In the last decades, Information Systems have gained particular importance for organizations, supporting most of their activities. It is a fact that organizations continue to increase spending on Information Technology and their budgets continue to rise, even in the face of potential economic downturns (Kanaracus, 2008). Given this importance, it has become increasingly necessary to evaluate its success. The literature suggests that in an organizational context, several factors may influence the success of information systems, and several studies identify these factors and include them in success models (e.g., (Davis, 1985; Venkatesh & Davis, 2000; Venkatesh et al., 2003; DeLone and McLean, 2003)). One of the literature's most used and cited success models is the Information Systems Success model, often referred to as DeLone and McLean's (1992, 2003, 2016). The application of DeLone and McLean's model in various studies has shown different results; however, it has

demonstrated that it can help identify the success variables of information systems used in different contexts or scenarios (Yakubu & Dasuki, 2018).

DeLone and McLean's model (2013) considers six dimensions or constructs to measure the information systems' success: System Quality, Information Quality, Service Quality, Intention to Use/Use, User Satisfaction and Net Benefits. System Ouality refers to the desirable characteristics of an information system and measures its technical success. Information Quality considers the desirable characteristics of the system output in terms of content and the respective reports and, to some extent, measures semantic success. Quality of Service includes all the support that a system offers to users. Intent to Use and Use refers to how users of the system use the capabilities of the information system. User Satisfaction refers to how effective the user is and how satisfied they are with the results obtained from using the information system. Benefits capture the overall impact of the system on users.

Academic Portal - Secretaria Online

The Secretaria Online is an academic portal that allows the information management of the ISCAP community, being a complex information system that supports various activities of the institution. The Secretaria Online supports the management of academic activity and other areas such as human resources, accounting, instructional communication and teaching activities. This Academic Portal aims to enable access to ISCAP information and facilitate the transfer of information among the entire academic community, having as primary objectives: improving the quality of student services; improving critical periods in the schedule of services; improving the quality of academic information, and improving the working conditions of employees. Figure 1 shows an example of a screenshot of Secretaria Online.

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Figure 1: Secretaria Online screenshot

Research Approach

As previously mentioned, this work aims to evaluate the success of adopting the Secretaria Online by the ISCAP's staff (teaching and non-teaching), based on DeLone and McLean's model. The research approach adopted involves a case study that allows interpreting and understanding the success of the environment (Walsham, 2006). This research applied a quantitative questionnaire, often used in information systems research, to determine an environment's dependent and independent variables without controlling them (Pinsonneault and Kraemer, 1993). According to Isaac and Michael (1995), questionnaires may be helpful to: answer questions raised, resolve observed issues, assess needs and objectives in order to determine whether specific goals have been met, establish a baseline against which comparisons can be made in the future, analyze trends over time, and in general, describe what exists, how much, and in what context.

The questionnaire used in this study was built in the LimeSurvey tool and structured into three groups of questions: one group on demographic information; another group on the usage habits of the respondents; and the third group with the questions related to the evaluation of the Secretaria Online. The group of questions related to the evaluation of the Secretaria Online was based on the DeLone and McLean model, and 23 measures or questions were defined and distributed among the six constructs: five questions are related to the Information Quality construct, five to the System Quality, three to the Service Quality, three to the Intention to Use/Use, three to the User Satisfaction and four measures to the Benefits construct. These 23 measures resulted from an extensive literature review (Table 1). After identifying several measures already validated in related works, the ones that, in our opinion, best suited Secretaria Online's evaluation were selected.

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Construct	Measure	Related Works
	Timeliness	DeLone & McLean, 1992; Wang et al, 2007; Wang & Liao, 2008; Halone et al., 2009; Semeon et al., 2010; Khayun & Ractham, 2011; Al-Shibly, 2011; Al-Debei, 2014; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Stefanovic et al., 2016; Tam & Oliveira, 2016; Ojo, 2017
	Adequacy	Wu & Wang, 2006; Halone et al., 2009; Wei et al., 2009; Semeon et al., 2010; Al-Shibly, 2011; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Jaafreh, 2017; Nizamani et al., 2017; Yu & Qian, 2018
Information	Availability	Rai et al., 2002; Halone et al., 2009; Kim et al, 2012; Mtebe & Raisamo, 2014; Nizamani et al., 2017
Quality	Accuracy	DeLone & McLean, 1992; Rai et al., 2002; Fan & Fang, 2006; Bernroider, 2008; Wei et al., 2009; Semeon et al., 2010; Al-Shibly, 2011; Al-Debei, 2014; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Stefanovic et al., 2016; Jaafreh, 2017; Nizamani et al., 2017; Ojo, 2017; Yu & Qian, 2018
	Relevance & Usefulness	Al-Shibly, 2011; DeLone & McLean, 1992; Fan & Fang, 2006; Halone et al., 2009; Jaafreh, 2017; Khayun & Ractham, 2011; Kim et al, 2012; Mtebe & Raisamo, 2014; Nizamani et al., 2017; Rai et al., 2002; Stefanovic et al., 2016; Tam & Oliveira, 2016; Ojo, 2017; Wang et al, 2007; Wei et al., 2009; Yu & Qian, 2018
	Availability	DeLone & McLean, 1992; Fan & Fang, 2006; Wu & Wang, 2006; Wang et al, 2007; Bernroider, 2008; Halone et al., 2009; Wei et al., 2009; Semeon et al., 2010; Al-Shibly, 2011; Al-Debei, 2014; Mtebe & Raisamo, 2014; Jaafreh, 2017; Yakubu & Dasuki, 2018
	Structure	DeLone & McLean, 1992; Rai et al., 2002; Fan & Fang, 2006; Bernroider, 2008; Semeon et al., 2010; Al-Shibly, 2011; Al-Debei, 2014; Jaafreh, 2017; Nizamani et al., 2017; Ojo, 2017
System	Ease of learning	DeLone & McLean, 1992; Semeon et al., 2010; Kim et. al, 2012; Mtebe & Raisamo, 2014; Jaafreh, 2017; Nizamani et al., 2017; Ojo, 2017; Yu & Qian, 2018
Quality	Ease of use	DeLone & McLean, 1992; Rai et al., 2002; Wu & Wang, 2006; Wang et al, 2007; Wang & Liao, 2008; Halone et al., 2009; Wei et al., 2009; Semeon et al., 2010; Khayun & Ractham, 2011; Kim et. al, 2012; Al-Debei, 2014; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Stefanovic et al., 2016; Tam & Oliveira, 2016; Jaafreh, 2017; Nizamani et al., 2017; Ojo, 2017; Yakubu & Dasuki, 2018; Yu & Qian, 2018
	Utility of System	DeLone & McLean, 1992; Bernroider, 2008; Halone et al., 2009; Wei et al., 2009; Manchanda & Mukherjee, 2014; Tam & Oliveira, 2016; Jaafreh, 2017; Ojo, 2017; Yu & Qian, 2018
Service Quality	Responsiveness	DeLone & McLean, 2003; Wu & Wang, 2006; Wang et al, 2007; Bernroider, 2008; Wang & Liao, 2008; Halone et al., 2009; Wei et al., 2009; Khayun & Ractham, 2011; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Stefanovic et al., 2016; Tam & Oliveira, 2016; Jaafreh, 2017; Nizamani et al., 2017; Yakubu & Dasuki, 2018; Yu & Qian, 2018

Table 1 - Measures selected for study

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Construct	Measure	Related Works					
	Reliability	DeLone & McLean, 2003; Wu & Wang, 2006; Bernroider, 2008; Wei et al., 2009; Khayun & Ractham, 2011; Kim et al, 2012; Jaafreh, 2017; Nizamani et al., 2017; Ojo, 2017; Yu & Qian, 2018					
	Utility of Service	DeLone & McLean, 2003; Wu & Wang, 2006; Wang & Liao, 2008; Kim et al, 2012; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Stefanovic et al., 2016; Nizamani et al., 2017; Yakubu & Dasuki, 2018; Yu & Qian, 2018					
Use / Intention to Use	Frequency of use	DeLone & McLean, 2003; Fan & Fang, 2006; Wu & Wang, 2006; Wang e al, 2007; Bernroider, 2008; Wang & Liao, 2008; Halone et al., 2009; We et al., 2009; Semeon et al., 2010; Khayun & Ractham, 2011; Kim et al, 2012; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Stefanovic et al., 2016; Tam & Oliveira, 2016; Jaafreh, 2017; Nizamani al., 2017; Yakubu & Dasuki, 2018; Yu & Qian, 2018					
	Actual use	DeLone & McLean, 2003; Rai et al., 2002; Wu & Wang, 2006; Halone et al., 2009; Semeon et al., 2010; Al-Shibly, 2011; Mtebe & Raisamo, 2014; Tam & Oliveira, 2016; Ojo, 2017					
	Nature of use	Bernroider, 2008; Al-Shibly, 2011; Ojo, 2017; Yu & Qian, 2018					
User Satisfaction	Adequacy	Al-Shibly, 2011; Stefanovic et al., 2016					
	Overall satisfaction	Rai et al., 2002; DeLone & McLean, 2003; Fan & Fang, 2006; Wu & Wang, 2006; Wang & Wang, 2007; Bernroider, 2008; Wang & Liao, 2008; Halone et al., 2009; Wei et al., 2009; Semeon et al., 2010; Khayun & Ractham, 2011; Kim et al, 2012; Al-Debei, 2014; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Tam & Oliveira, 2016; Jaafreh, 2017; Nizamani et al., 2017; Ojo, 2017; Yakubu & Dasuki, 2018					
	User information satisfaction	DeLone & McLean, 2003; Mtebe & Raisamo, 2014; Jaafreh, 2017; Nizamani et al., 2017					
	Job improvement	Wang et al, 2007; Bernroider, 2008; Wei et al., 2009; Khayun & Ractham, 2011; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Tam & Oliveira, 2016; Ojo, 2017					
Benefits	Job performance	DeLone & McLean, 2003; Bernroider, 2008; Wang & Liao, 2008; Halone et al., 2009; Wei et al., 2009; Khayun & Ractham, 2011; Manchanda & Mukherjee, 2014; Stefanovic et al., 2016; Jaafreh, 2017					
	Job simplification	Wang & Liao, 2008; Khayun & Ractham, 2011; Al-Shibly, 2011; Kim et al, 2012; Mtebe & Raisamo, 2014; Stefanovic et al., 2016; Tam & Oliveira, 2016; Ojo, 2017; Yu & Qian, 2018					
	Improve communication	Wang et al, 2007; Bernroider, 2008; Wei et al., 2009; Khayun & Ractham, 2011; Manchanda & Mukherjee, 2014; Mtebe & Raisamo, 2014; Tam & Oliveira, 2016; Ojo, 2017					

In order to identify and validate the 23 items of the questionnaire, a test was conducted with the participation of 25 users. Thus, participants received a detailed definition of the constructs and were instructed to indicate which construct they believed each item best represented. Therefore, this task followed Howard and Melloy (2016) suggestions.

Table 2 shows the items with enough assignments for each construct. To answer to the 23 questions/items, a 5-point Likert Scale was used, with the following labels: 1 - I totally disagree; 2 - I disagree; 3 - I neither agree nor disagree; 4 - I agree; 5 - I totally agree.

After this validation, the questionnaire was sent to 246 teaching staff and 65 non-

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teaching staff. The questionnaire was available for completion for 38 days and was completed by 93 teaching staff (response rate: 37,8%) and 16 nonteaching staff (response rate: 24,6%), resulting in an overall response rate of 35%. Table 3 summarises the demographic information of 109 respondents. In this study, the software SPSS 26 for Windows was used for the data analysis needs. Statistics methods adopted in this paper are mainly descriptive statistics and the test score reliability coefficient Cronbach's Alpha.

Item	Measure	Question
QINF1	Timeliness	The SO provides accurate information.
QINF2	Adequacy	The SO provides current information.
QINF3	Availability	The SO provides relevant and useful information.
QINF4	Accuracy	The SO provides well-organized information in an appropriate format.
QINF5	Relevance & Usefulness	The information export and print are adequate.
QSI1	Utility of System	The SO is useful for the performance of activities.
QSI2	Availability	The SO is always available.
QSI3	Structure	The SO is well structured.
QSI4	Ease of use	The SO is easy to use.
QSI5	Ease of learning	The SO is easy to learn.
QSER1	Utility of Service	Help mechanisms are useful.
QSER2	Responsiveness	Technical support meets the needs.
QSER3	Reliability	Technical support is reliable
USO1	Frequency of use	The frequency of use is high.
USO2	Actual use	I use all the features available for my profile.
USO3	Nature of use	My activity is dependent on the use of the system.
SAT1	Adequacy	I am satisfied with the information provided in the SO.
SAT2	Overall satisfaction	The SO meets my expectations and needs.
SAT3	User information satisfaction	Overall, I am satisfied with the use of the SO.
BEN1	Job improvement	The SO allows reducing time in accomplishing tasks.
BEN2	Job performance	The SO makes it easier to accomplish tasks.
BEN3	Job simplification	The SO allows being more efficient in performing tasks
BEN4	Improve communication	The SO enables improved communication between people and departments.

Table 2 – Measures items

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Background Variables		Teaching Staff (N)	Non- Teaching Staff (N)	Total (N)	%
Candan	Female	54	8	62	57%
Gender	Male	39	8	47	43%
	<39 years	14	2	16	15%
Age	>= 40 and <49 years	23	12	35	32%
	>= 50 years	56	2	58	53%
	Bachelor	4	7	11	10%
Dograa	Master	33	5	38	35%
Degree	PhD	56	0	56	51%
	Other	0	4	4	4%
Years at ISCAP	< 5 years	19	3	22	20%
	>= 5 and < 10 years	15	1	16	15%
	>= 10 years	59	12	71	65%

Table 3 - Demographic Information of respondents

Results and Discussion

Table 4 shows the statistical measures used in this study to validate the results. The standard deviation (Std Dev) values show that the data generally have a solid central tendency (Weisberg, 1991). The skewness (Skew) and kurtosis (Kurt) values, which measure the concentration or dispersion, also show that the distribution tends toward normality, assuming that the acceptable skewness values must be between ± 3 and the appropriate kurtosis must be in the range of ± 10 (Brown, 2006).

The Kaiser-Meyer-Olkin test (KMO) calculated to examine the appropriateness of factor analysis application shows that for all constructs, the value is higher than 0.6, thus fulfilling the appropriate conditions (Hair et al., 2014). Simultaneously, Bartlett's test presented a sig value of 0.000, demonstrating the significance of the items that make up the same construct.

The Total Explained Variance (TEV) calculated for each construct presents, except for the "Use/Intention to Use" construct, values higher than 60%, which reveals that items underlying the same construct show an appropriate percentage of the explained total variance (Hair et al., 2014).

According to Souza et al. (2017), the quality of the information provided by instruments depends, in part, on their psychometric properties, highlighting the instrument's reliability and validity as key in validating a questionnaire. Yu and Qian (2018) also refer that reliability and validity can be assessed by psychometric properties, which are measured by internal consistency and convergence. Based on this assumption, the Cronbach's Alpha (CA) coefficient was calculated to assess the reliability of the questionnaire and its results. According to the literature, CA should present values above 0.7 (Nunnally & Bernstein, 1994); however, Carmines

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and Zeller (1979) suggest that values between 0.6 and 0.7 can be considered satisfactory. The CA value for almost all constructs allows high confidence in the validity of the results presented in this paper. However, there must be some caution regarding the Use/Intention to Use Construct results since the CA value is only 0.62 (despite being in a confidence interval considered satisfactory by some authors).

Item	Mea n	Media n	Mod e	Std Dev	Skew	Std Skew Error	Kurt	Std Kurt Error	КМО	TEV	CA
Information Quality Construct										66.20 %	0.86
QINF1	4.23	4.00	4	0.702	- 0.843	0.231	1.192	0.459			
QINF2	4.17	4.00	4	0.780	- 0.913	0.231	0.856	0.459			
QINF3	4.35	4.00	5	0.699	- 0.934	0.231	0.896	0.459			
QINF4	3.79	4.00	4	1.046	- 0.851	0.231	0.286	0.459			
QINF5	3.45	4.00	4	0.995	- 0.375	0.231	- 0.399	0.459			
System Qu	ality Co	nstruct							0.77	65.87 %	0.86
QSI1	4.47	5.00	5	0.632	- 0.998	0.231	1.033	0.459			
QSI2	3.85	4.00	4	0.951	- 0.819	0.231	0.165	0.459			
QSI3	3.67	4.00	4	1.106	- 0.608	0.231	- 0.409	0.459			
QSI4	3.73	4.00	4	1.103	- 0.761	0.231	- 0.041	0.459			
QSI5	3.96	4.00	4	0.912	- 0.747	0.231	0.259	0.459			
Service Qu	ality Co	nstruct							0.69	77.75 %	0.85
QSER1	3.43	3.00	3	0.937	- 0.141	0.231	- 0.302	0.459			
QSER2	3.93	4.00	4	0.857	- 0.755	0.231	0.655	0.459			
QSER3	4.11	4.00	4	0.750	- 0.452	0.231	- 0.280	0.459			
Use/Intention to Use Construct									0.62	57.31 %	0.62
USO1	4.06	4.00	4	0.831	- 0.911	0.231	1.175	0.459			
USO2	3.39	3.00	4	1.054	- 0.127	0.231	- 0.905	0.459			
USO3	4.02	4.00	4	0.972	- 1.148	0.231	1.285	0.459			

Table 4 - Statistical measures

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Item	Mea n	Media n	Mod e	Std Dev	Skew	Std Skew Error	Kurt	Std Kurt Error	кмо	TEV	СА
User Satisfaction Construct									0.76	88.52%	0.93
SAT1	3.97	4.00	4	0.810	- 0.800	0.231	0.586	0.459			
SAT2	3.77	4.00	4	0.959	- 0.614	0.231	- 0.203	0.459			
SAT3	4.02	4.00	4	0.757	- 0.812	0.231	0.977	0.459			
Benefits Co	onstruc	t			-	-	-		0.83	81.79%	0.92
BEN1	3.95	4.00	4	0.937	- 0.871	0.231	0.676	0.459			
BEN2	3.99	4.00	4	0.918	- 0.713	0.231	0.125	0.459			
BEN3	4.00	4.00	4	0.962	- 0.762	0.231	- 0.025	0.459			
BEN4	3.44	4.00	4	1.101	- 0.397	0.231	- 0.454	0.459			

Kaiser Normalization Varimax rotation method

Kaiser-Meyer-Olkin measure of sampling adequacy (KMO)= 0.916 Bartlett's test sig. 0.000. Total Explained Variance: 71.18%

In order to complement the data analysis, a paired-sample t-test was performed to check if there were significant differences between the responses of the items of each construct. Paired-sample t-tests are generally appropriate and widely used when there is a match (Zimmerman, 1997), in this case, on items related to the same construct. Table 5 presents the paired ttest results. Regarding the items of the Information Quality construct, QINF3 is the item that stands out for presenting statistically significant differences when compared with the other items of the construct, being the one that presents the highest mean response value. Conversely, the QINF5 item presents a lower mean response value, and the difference with the other items is also statistically significant.

Concerning the items of the System Quality construct, item QSI1 is the one that shows a statistically significant difference from the other items, with a higher mean response value than the remaining items. In the items of the Quality of Service construct, item QS3 is the one that stands out the most for presenting a mean response value, statistically higher than the other items. The item USO1 is the one that stands out among the items of the Use/Intention to Use construct, presenting significant differences from the other items and being the one that presents a higher mean response value. Finally, in the User Satisfaction construct, item BEN3 has the highest mean response value, and item BEN4 has the lowest mean value, having both statistically significant differences.

Constructs	Items	QINF1	QINF2	QINF3	QINF4
Information	QINF1		1,228	-2,307**	5,069***
Quality	QINF2	-1,228		-3,002***	4,461***

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Constructs	Items	QINF1	QINF2	QINF3	QINF4
	QINF3	2,307**	3,002***		6,591***
	QINF4	-5,069***	-4,461***	-6,591***	
	QINF5	-8,694***	-8,122***	-9,860***	-4,056***
		QSI1	QSI2	QSI3	QSI4
	QSI1		<u>7,465***</u>	<u>8,953***</u>	<u>8,074***</u>
Sustem Quality	QSI2	-7,465***		1,705*	1,025
System Quanty	QSI3	-8,953***	-1,705*		-1,352
	QSI4	-8,074***	-1,025	1,352	
	QSI5	-6,486***	1,014	4,392***	4,190***
		QSER1	QSER2	QSER3	
Somuico Qualita	QSER1		-7,366***	-8,819***	
Service Quality	QSER2	7,366***		-3,216***	
	QSER3	8,819***	3,216***		
		USO1	USO2	USO3	
Use/Intention to	US01		6,863***	0,439	
use	USO2	-6,863***		-5,689***	
	USO3	-0,439	5,689***		
		SAT1	SAT2	SAT3	
Hear Satisfaction	SAT1		3,898***	-1,149	
User Satisfaction	SAT2	-3,898***		-4,460***	
	SAT3	1,149	4,460***		
		BEN1	BEN2	BEN3	BEN4
	BEN1		-0,729	-0,928	6,038***
Benefits	BEN2	0,729		-0,228	6,479***
	BEN3	0,928	0,228		6,837***
	BEN4	-6,038***	-6,479***	-6,837***	
*90%Sig.; ** 95% S	Sig; ***99%) Sig.			

Conclusions

This paper presents the results of a study that evaluates an Academic Portal's success, the case of Secretaria Online, from the perspective of ISCAP's staff. This study applied one of the most used models in empirical studies (Semeon et al., 2010), the DeLone and McLean information systems success model, as a theoretical reference for this evaluation.

This paper presents an exploratory analysis of the data and an analysis of Cronbach's Alpha (CA), which allows testing the lower limit of the internal consistency of a group of items related to each construct. The study also presents a comparative analysis of response items for each construct

The exploratory character of this study allowed gathering information and familiarization with the DeLone and McLean model in a school administrative context. The results obtained in this study presuppose that Secretaria Online plays a critical role in ISCAP's activities; however, the evaluation provided by the users shows that several aspects must improve.

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