



Adaptation And Validation Of An Instrument To Measure Information Literacy In Teachers Of Public Technological Institutes Of Higher Education

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Abstract. The goal of this study was to adapt and validate an instrument to measure information literacy for teachers of Public Technological Institutes of Higher Education (PTIHE) in the city of Lima, Peru. The study was descriptive, cross-sectional, observational and instrumental. The sample consisted of 108 teachers collected from eight different Higher Education Institutes. We worked with seven expert judges in information literacy and in the construction of instruments, most of whom presented a strong association between the scores attributed to the adapted instrument. The results showed that the adapted instrument reported a high degree of reliability with a Cronbach's alpha value of 0.9551 and its construct validity was measured by an orthogonal factor analysis with a meritorious KMO value of 0.8225 under a significance of 0.000 in the Bartlett's sphericity test. It is concluded that the adapted instrument is valid and reliable to evaluate the level of information literacy in teachers of Public Technological Institutes of Higher Education.

Keywords: Information literacy, information skills, validity, reliability.

INTRODUCTION

Technology advances have created new ways of access information, which in turn have generated the need for people to develop skills in handling information. Information literacy has become a requirement of citizens, which is an area of the key competences of every citizen (European Commission, 2008). This context has led educational institutions to include the development of informational competencies in students as a transversal content (UNESCO, 2005). For this reason, it is necessary to know the level of these skills in teachers since they play a fundamental role in the educational process (González,

2012). Therefore, it is important to measure and evaluate the level of information literacy in teachers. This task can be done with measurement instruments, which implies that it is necessary to design instruments in each educational community since each of these present different realities (Tepe & Tepe, 2015; Beltrán et al., 2017; Pinto & Guerrero, 2017; Mahmood, 2017; Jo & Ha, 2019). The importance of information literacy has led to the design of instruments to measure this competence in the educational community, which are mostly focused on librarians and students (Martínez, 2013; Boh Podgornik et al., 2015; Van Helvoort, 2017). Few instruments that evaluate the information skills of higher-level education teachers exist (Licea, 2007; Meneses & Pinto, 2011; Morales et al., 2018). In the international environment, information literacy instruments have been adapted on different samples, such as students in basic education, as well as in teachers in basic education (García et al., 2019; Rodríguez et al., 2012; Hani Syazillah et al., 2018).

In this study, the instrument named Cuestionario Desarrollo de habilidades informativas developed by Toledo and Maldonado (2015) was adapted considering a comparative analysis and verifying that it complied with the psychometric properties since the original instrument presented high validity and reliability indexes (Cardoso et al., 2010). The content validity was carried out by seven expert judges and the construct validity was verified using a dimensional theory approach using factor analysis considering the methodology of different authors (Rivera, 2014; Durán-Aponte & Durán-García, 2015). This validation allowed us to establish the psychometric properties of the instrument. (Balluerka et al., 2007; Ferreira et al., 2017).

It was concluded that the adaptation of this instrument complied with the psychometric properties of validity and reliability so that it can be used by teachers of Institutes of Higher Education and thus provide new knowledge in this area.

METHODS

Participants

The population was made up of 508 active teachers who carry out their activities in 8 Public Technological Institutes of Higher Education (PTIHE) located in Metropolitan Lima in 2020. We worked with a selected sample of that population, calculated considering a sampling error of 8.5 % and a confidence level of 95% resulting in 108 teachers who were selected using the simple random sampling technique without replacement of units (Cochran, 1980). Teacher's responses were collected between July and September 2020.

Design

The study was descriptive, cross-sectional, comparative and instrumental.

Instrument

The adaptation of the instrument presented in this article was based on the original version of the Information Skills Development Questionnaire prepared by Toledo and Maldonado (2015) for teachers and librarians of educational institutions in Mexico.

Procedure

Coordination with the Higher Education Management Office (OGESUP-Spanish name initials) of the Regional Directorate of Education of Metropolitan Lima took place, in order to obtain a list with personal work information of the teachers, which was used for the random selection of teachers in the final sample.

A pilot test was applied to 30 professors from the selected institutes in order to verify the understanding of the questions of the proposed instrument and to have a preliminary estimate of the application time of the instrument, which resulted in an average of 20 minutes. Teachers who participated in this pilot study were excluded from the random drawing of the final sample.

The researchers spoke with the directors and teachers of the selected institutes to explain the goal of the research and its importance, then the instrument (online version) was shared with them, which was available at the following link: https://docs.google.com/forms/d/e/1FAIpQLSdckANgIpZqg4R3jO8PwDO-eJZc_CNgi3vPKhcy15roQ4v3Lg/closedform. The teacher's answer to the survey were collected until September 1, 2020.

The descriptive analysis of the sociodemographic variables of the teachers of Technological Higher Education Institutes considering the types of relationship with the institution (hired and tenure-track) are shown in Table 1.

Table 1. Frequency of descriptive data of PTIHE teachers according to their relationship with the institution (hired or tenure-track).

Characteristic	Hired		Tenure-track		Total		P value ¹
	N	%	N	%	N	%	
Sex							
Woman	35	53.03	16	38.10	51	47.22	0.13
		%		%		%	
Man	31	46.97	26	61.90	57	52.78	
		%		%		%	
Marital status							
Married/ cohabiting	45	68.18	34	80.95	79	73.15	0.104
		%		%		%	
Single/separated	18	27.27	4	9.52%	22	20.37	
		%		%		%	

Others	3	4.55%	4	9.52%	7	6.48%	
Grade							
Bachelor	31	46.97%	16	38.10%	47	43.52%	0.065
Magister	34	51.52%	21	50.00%	55	50.93%	
Doctor	1	1.52%	5	11.90%	6	5.56%	

Source of basic data: Data collected by researchers.

¹P-value associated with the Chi-square hypothesis test of independence.

Regarding the sex of the participants, a greater number of men (52.78%) was observed with 5.56% more participants with respect to the number of women. However, among the hired teachers, a greater female participation was registered (53.03%), while, in the group of tenure-track teachers, women represented less than half of the participants of that group (38.10%).

With regard to marital status, the number of married or cohabiting people (73.15%) is higher than the number of single ones or separated ones (20.37%). Additionally, in the group of tenure-track teachers, around 8 people out of 10 were married or they were living with another person. Single or separated teachers in this group represented 9.52% of all tenure-track teachers. In the group of hired teachers, 68.18% were married or cohabiting with a partner and 27.27% expressed to be single or separated (see Table 1).

Regarding the maximum academic degree achieved by the participants, a greater number of teachers with a master's degree (50.93%) was found, followed by 43.52% of teachers with a bachelor's degree and 5.56% teachers with a doctorate. In the group of tenure-track teachers, high school graduates represented 38.10%; half of teachers (50%) had a master's degree and 11.90% of teachers have a doctorate. Considering the group of hired teachers, participants with a bachelor's degree represented 46.97%; 51.52% had a master's degree, and 1.52% had a doctorate.

Table 2 presents the results of the descriptive analysis of the quantitative sociodemographic variables.

Table 2. Frequency of descriptive data of PTIHE teachers according to their relationship with the institution (hired or tenure-track).

Characteristic	Hired	Tenure-track	Total	P value ²
Age				

N	66	42	108	0.000
Minimum	30	42	30	
Maximum	65	68	68	
Mean	47.05	57.24	51.009	
Median	46	58	52	
Coefficient of variation	18.46%	9.70%	17.81%	
Years of experience				
Minimum	66	42	108	0.000
Maximum	1	1	1	
Mean	20	39	39	
Median	6.31	19.57	11.47	
Coefficient of variation	6	19	9.5	
Minimum	77.48%	40.52%	78.39%	

Source of basic data: Data collected by researchers.

² P-value associated with the Mann Whitney non-parametric hypothesis test.

The average age of the teachers interviewed was approximately 51 years old whose distribution was different between the hired and tenure-track teachers. In the group of hired teachers, their average age was 47.05 years old with a coefficient of variation of 18.46%, indicating a moderate variability. In the case of the tenure-track teachers, their average age was higher, with a value of 57.24 years old and with a variation coefficient of 9.70% indicating that in this group the ages are more homogeneous. For this reason, there is a statistical difference in the median age between these groups (P value <0.05) indicating a higher age for the group of tenure-track teachers (see Table 2).

With respect to the time of experience (measured in years) of the teachers in their work activities, they had an average of 11.47 years, where the higher average time of experience was found in the group of tenure-track teachers (19.57 years) in comparison with the group of hired teachers (6.31 years). In the same way, the distribution of the ages of the tenure-track teachers presented less variability compared to the group of hired teachers, which resulted evident when comparing the estimated coefficients of variation (40.52% and 77.48% respectively).

RESULTS

Content validity

For the expert judgment, three criteria were considered: relevance, coherence and clarity whose scores range from 0 to 3.

The results showed that the expert judges evaluated most of the questions of the instrument as good (see Table 3). In this way, it is stated that the highest concentration of scores of the 7 expert judges is found in the 'Totally agree' category.

Table 3. Table of distribution of the classification of the items made by the expert judges for the relevance categories, coherence and clarity of the Expert Judgment Validity Format: Questionnaire to measure Information Literacy.

Judge	Statistics	Total Score of Questions			
		Disagree	Somewhat agree	Agree	Strongly agree
1	N	0	0	10	119
	%	0.0%	0.0%	7.8%	92.2%
2	N	12	3	18	96
	%	9.3%	2.3%	14.0%	74.4%
3	N	0	0	13	116
	%	0.0%	0.0%	10.1%	89.9%
4	N	0	0	8	121
	%	0.0%	0.0%	6.2%	93.8%
5	N	0	34	1	94
	%	0.0%	26.4%	0.8%	72.9%
6	N	0	0	2	127
	%	0.0%	0.0%	1.6%	98.4%
7	N	0	0	10	119
	%	0.0%	0.0%	7.8%	92.2%

Source of basic data: Data collected by researchers.

The average scores given by the judges are quite similar, with values close to 2.90 points. The median of the scores was the same for all the judges. However, it can be observed that judges 2 and 5 presented a high variation in their responses, presenting a variation coefficient of 36.6% and 35.9% respectively (see Table 4). The values calculated for the other judges were found close to 10%, which indicates greater homogeneity in the responses.

Table 4. Table of descriptive statistics of the answers given by the expert judges of the Expert Judgment Validity Format: Questionnaire to measure Information Literacy.

Statistics	Judge						
	1	2	3	4	5	6	7
N	129	129	129	129	129	129	129

Mean	2.92	2.53	2.90	2.94	2.47	2.98	2.92
Median	3	3	3	3	3	3	3
coefficient of variation	9.2%	36.6%	10.4%	8.2%	35.9%	4.2%	9.2%

Source of basic data: Data collected by researchers.

The probability of total agreement was calculated; those results (see Table 5) showed that there is a high probability of agreement among most of the judges (PCT > 0.70). The lowest value of this indicator was evidenced between judges 2 and 5 whose probability of agreement was 56.59%.

Table 5. Table of total agreement between the judges in relation to the answers given in the Expert Judgment Validity Format: Questionnaire to measure Information Literacy.

Judges (I)	1	2	3	4	5	6	7
		67.44		87.60		92.25	100.00
1		%	82.17%	%	67.44%	%	%
				69.67		74.42	
2			65.12%	%	56.59%	%	67.44%
				85.27		88.37	
3				%	67.44%	%	82.17%
						92.25	
4					68.99%	%	87.60%
						72.09	
5						%	67.44%
6							92.25%
7							

Source of basic data: Data collected by researchers.

Additionally, the gamma correlation coefficient was calculated in order to assess the existence of a correlation between the scores given by the judges, as well as the degree of intensity of this association. It was observed that the scores of the fifth judge had little correlation with the other judges, but the other judges presented a moderate/strong association between the scores attributed to them (see Table 6).

Table 6. Table of Range Association Coefficients calculated to evaluate the association between the scores of the Judges (I) and (J).

Judges (I)	Judges (J)						
	1	2	3	4	5	6	7
1		-0.455	-1.000	0.280	0.082	0.858	1.000
2			-0.5706	-0.4573	-0.1466	0.338	-0.4545
3				0.130	0.445	-1.000	-1.000
4					0.256	-1.000	0.280
5						0.469	0.082
6							0.858
7							

Source of basic data: Data collected by researchers.

Reliability analysis

The reliability of the present adaptation of the instrument was measured using the Cronbach's alpha coefficient. Likewise, to verify the importance of each item of the instrument, the Item Validity Index (Salkind, 2010) was used.

The reliability results show that items 33 and 57 had a validity index value lower than 0.50 but the other items had validity indexes above 0.50, being their maximum value (0.7107) observed in item 61. It was recorded that, although the validity index has values lower than 0.50 for items 33 and 57; this does not affect the reliability of the instrument, because even in the scenario of a possible exclusion, the reliability of the instrument was 0.9551, indicating a high degree of reliability of the instrument.

Table 7. Reliability analysis considering all the items that make up the instrument designed to measure the informational and ICT competencies of a sample of Peruvian PTIHE teachers.

Items	Observations	Item-test correlation	Item-remainder correlation	Cronbach's alpha deleting the item
22	108	0.5777	0.5510	0.9570
23	108	0.6321	0.6080	0.9567
24	108	0.6369	0.6131	0.9567
26	108	0.5505	0.5227	0.9572
27	108	0.5201	0.4910	0.9574
28	108	0.5467	0.5187	0.9572
29	108	0.5404	0.5121	0.9572
30	108	0.5956	0.5698	0.9569
31	108	0.5217	0.4927	0.9573
32	108	0.5464	0.5184	0.9572
33	108	0.3284	0.2932	0.9584
34	108	0.5509	0.5231	0.9572

36	108	0.5015	0.4716	0.9575
37	108	0.5575	0.5300	0.9572
38	108	0.5509	0.5231	0.9572
39	108	0.6267	0.6024	0.9568
40	108	0.5941	0.5682	0.9570
41	108	0.5375	0.5091	0.9573
42	108	0.6523	0.6292	0.9566
43	108	0.6616	0.6390	0.9566
44	108	0.6489	0.6256	0.9567
45	108	0.6965	0.6758	0.9564
46	108	0.6997	0.6791	0.9564
47	108	0.5085	0.4789	0.9574
48	108	0.6184	0.5936	0.9568
49	108	0.6273	0.6029	0.9568
50	108	0.6684	0.6461	0.9565
51	108	0.6984	0.6777	0.9564
52	108	0.6284	0.6041	0.9568
53	108	0.6444	0.6209	0.9567
54	108	0.6837	0.6623	0.9565
55	108	0.5932	0.5673	0.9570
56	108	0.6339	0.6099	0.9567
57	108	0.4305	0.3982	0.9578
58	108	0.6677	0.6454	0.9566
59	108	0.6644	0.6419	0.9566
60	108	0.6961	0.6754	0.9564
61	108	0.7107	0.6907	0.9563
62	108	0.6976	0.6769	0.9564
63	108	0.6452	0.6217	0.9567
64	108	0.5994	0.5737	0.9569
65	108	0.5603	0.5329	0.9571
66	108	0.5890	0.5628	0.9570
Instrumen				
t				0.9551

Source of basic data: Data collected by researchers.

Reliability Analysis for the Informational Competences items

Once the global analysis of the instrument had been carried out, the reliability for each of the variables defined by Toledo and Maldonado (2015) was analyzed. Table 8 shows the Validity indexes for the items related to informational competences. Most of the items

presented a reasonable correlation with the instrument, indicating its importance to measure the concept of informational competences. The highest correlation was observed for item 45 (0.702) and the lowest for item 33 (0.4134). Using the suppression the item technique the values Cronbach's alpha are higher than 0.90, providing a global reliability in informational competencies of 0.9259.

Table 8. Reliability analysis of the instrument proposed by Toledo and Maldonado (2015) considering only the items associated with the informational competences of a sample of Peruvian PTIHE teachers.

Items	Observation:	Item-test correlation	Item-remainder correlation	Cronbach's alpha deleting the item
22	108	0.6136	0.5681	0.9228
23	108	0.6143	0.5732	0.9228
24	108	0.6201	0.58	0.9227
26	108	0.5904	0.5499	0.9231
27	108	0.6123	0.5612	0.923
28	108	0.6417	0.6057	0.9224
29	108	0.6131	0.5718	0.9228
30	108	0.6605	0.6216	0.922
31	108	0.5268	0.4644	0.925
32	108	0.5259	0.4746	0.9243
33	108	0.4134	0.3326	0.9286
34	108	0.5737	0.5194	0.9237
37	108	0.5965	0.5616	0.9232
39	108	0.6855	0.6533	0.9217
40	108	0.5982	0.562	0.9231
41	108	0.5555	0.4903	0.9249
42	108	0.6898	0.655	0.9215
44	108	0.656	0.6251	0.9224
45	108	0.702	0.6688	0.9213
46	108	0.6885	0.6549	0.9216
47	108	0.5473	0.5022	0.9238
48	108	0.6521	0.6088	0.9221
49	108	0.619	0.5739	0.9227
50	108	0.651	0.6089	0.9221
51	108	0.6731	0.635	0.9217
Instrument				0.9259

Source of basic data: Data collected by researchers.

Reliability Analysis for ICT Competencies items

Table 9 shows the Validity indexes for the items of the instrument that are associated with ICT Competences. A moderate correlation was recorded between each of these items and the instrument. The highest correlation observed was 0.8004 (item 62) and the lowest was 0.6197 (item 52). The Cronbach's alpha coefficient values were recorded above 0.90. The value of this indicator for the ICT skills instrument was 0.9181, showing a high degree of reliability for the section of the instrument designed to measure ICT skills.

Table 9. Reliability analysis of the instrument proposed by Toledo and Maldonado (2015) considering only the items associated with ICT skills of a sample of Peruvian PTIHE teachers.

Items	Observations	Item-test correlation	Item-remainder correlation	Cronbach's alpha deleting the item
		0.619		
52	108	7	0.5558	0.9153
		0.715		
53	108	1	0.6477	0.9121
		0.792		
54	108	8	0.7316	0.909
		0.642		
55	108	1	0.5387	0.9204
		0.741		
58	108	5	0.6989	0.911
		0.680		
59	108	4	0.6247	0.913
		0.780		
60	108	5	0.7453	0.9099
		0.782		
61	108	9	0.7367	0.9086
		0.800		
62	108	4	0.7493	0.9077
		0.754		
63	108	4	0.711	0.9103
		0.710		
64	108	3	0.655	0.9118
		0.700		
65	107	9	0.6485	0.9121

			0.681		
66	108	8	0.6193	0.913	
Instrument				0.9181	
t					

Source of basic data: Data collected by researchers.

Construct Validity

The tests based on the Kayser-Meyer-Olkin (KMO) statistic were used, where the value of 0.8225 was obtained, indicating that the existing correlation structure between the different items of the instrument is meritorious for the conduction of an orthogonal factor analysis. In addition, the P value resulting from the Bartlett's hypothesis test was 0.00, confirming that the correlation structure between the item scores is adequate for a decomposition by common factors, through the orthogonal factor analysis technique.

Factorial analysis

To analyze the structure of the questionnaire, the assessment of the two variables that constituted the construct of information literacy included in the Questionnaire was carried out. The first variable evaluated by Toledo and Maldonado (2015) was informational competences, with 5 dimensions (factors) associated with informational competence after performing an orthogonal factor analysis on the scores obtained from the interviewed individuals. Our study followed the steps of Toledo and Maldonado (2015) with the aim of verifying if the dimensions defined by the authors presented the same behavior in the adequacy of the instrument for the Peruvian teachers interviewed. The analysis began with a spectral decomposition of the correlation matrix between the items that make up the instrument (see Table 10), which was performed using the orthogonal factor analysis model (Spearman, 1904; Mardia, Kent and Bibby, 1979; Hamilton, 2013).

Table 10. Decomposition of the total variance for the 26 items of the instrument associated with Informational Competences.

Factor	Eigenvalue	Proportion of Total Variance	Proportion of Cumulative Variance
Factor 1	9.21	0.59	0.59
Factor 2	1.81	0.12	0.71
Factor 3	1.47	0.09	0.80
Factor 4	1.09	0.07	0.87
Factor 5	0.81	0.05	0.92

Remainin g	1.18	0.08	1.00
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Source of basic data: Data collected by researchers.

It is concluded that 5 factors accumulated 92.0% of the variability of the data set (see Table 10). Toledo and Maldonado (2015) stated that there is a correlation structure that allows the construction of 5 factors (see Table 11), extracted from the proposed model, which will represent the informational competences of Peruvian PTIHE teachers.

Table 11. Description of the factors associated with informational competence

Factor	Description
1	Ability to determine information
2	Use of information
3	Information evaluation
4	Access to information
5	Information need

Source: Adapted from Toledo and Maldonado (2015).

The structure of the factor loadings according to each of the items evaluated in the instrument is presented in Table 12. In the case of Factor 3, an inverse association is observed between items 39 (-0.0142) and 42 (- 0.0017). This result was different from the one found by Toledo and Maldonado (2015) and may be a consequence of the composition of the sample. However, the other factors showed a coincidence of signs with those of the original instrument, indicating their suitability for the concepts they are intended to represent (see Table 12).

This analysis seeks to verify whether the intensity of the associations found by Toledo and Maldonado (2015) can also be observed in the sample of Peruvian PTIHE teachers in whom the application of the instrument to be validated was carried out. The results showed that it was not possible to find the same intensity of correlation in all the defined factors. The maximum correlation found was 0.7187, which corresponds to item 42 of the instrument proposed by Toledo and Maldonado (2015) in factor 2. The lowest correlation (in module) found was 0.0017, corresponding to factor 3.

Table 12. Factor loads for the Informational Competences variable obtained after the application of an Orthogonal Factor Analysis model with varimax rotation performed to validate the instrument.

Item	Factor				
	1	2	3	4	5
22					0.0642

23			0.0631
24		0.6127	
26	0.0510		
27	0.2152		
28	0.3285		
29	0.1159		
30			0.6626
31			0.1328
32			0.0722
33			0.0278
34			0.2662
37	0.3624		
		-	
39		0.0142	
	0.510		
40	3		
41			0.5125
		-	
42		0.0017	
	0.379		
44	1		
	0.481		
45	0		
	0.718		
46	7		
47		0.2249	
48		0.1527	
49		0.1814	
	0.153		
50	9		
51	0.1174		

Source of basic data: Data collected by researchers.

ICT skills assessment

In the validation of ICT skills, an orthogonal factorial analysis was carried out considering that Toledo and Maldonado (2015) define 3 factors (see Table 13) to measure ICT skills.

Table 13. Description of the factors associated with ICT skills.

Factor	Description
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1	Deepening of knowledge
2	Use of ICT
3	Basic notions of ICT

Source: Adapted from Toledo and Maldonado (2015).

An initial analysis to evaluate the correlation structure between the scores of the variables associated with these competencies resulted in a KMO index value of 0.865 and a P-value associated with the Bartlett hypothesis test of less than 5% (P-value = 0.000), both results showed that the existing correlation structure was adequate for the decomposition into orthogonal factors.

Table 14 shows the initial results of this decomposition where the first 3 factors are responsible for 94.71% of the total variability.

Table 14. Decomposition of the total variance for the 26 items of the instrument associated with ICT Competences

Factor	Eigenvalue	Proportion of Total Variance	Proportion of Cumulative Variance
	2.8887		
Factor1	1	0.3662	0.3662
Factor2	2.3103	0.2928	0.659
	2.2731		
Factor3	4	0.2881	0.9471
Remainin g	1.1182 6	0.0529	1

Source: Prepared from the data collected by the researchers.

The estimation of factor loadings and their corresponding correlation with the items of the instrument are presented in Table 15. The highest correlation can be observed in item 63, which corresponds to the first Factor, and the lowest correlation was observed in item 64 that corresponds to the third factor. All the variables presented a positive association with the estimated common factors, as established by Toledo and Maldonado (2015).

Table 15. Factor loads for the ICT Competences variable obtained after applying an Orthogonal Factor Analysis model with varimax rotation, performed to validate the instrument.

Ítem	Factor		
	1	2	3
52			0.3478
53			0.6401
54		0.3359	
55			
58		0.6549	
59		0.6238	
60	0.3658		
61		0.3999	
62	0.4211		
63	0.7537		
64			0.2171
65	0.8423		
66	0.5852		

Source: Prepared from the data collected by the researchers.

DISCUSSION and CONCLUSIONS

Regarding the adaptation of the instrument to the Peruvian reality, we must mention that the results obtained in this study are consistent with those obtained by Toledo and Maldonado (2005). However, in factor 3 of the informational competences, we observed the existence of negative factor loads associated with items 39 and 42. Toledo and Maldonado (2005) found that all factor loads had positive signs. One possible explanation, which would justify the presence of some negative signs, is provided by the difference in how the sample of teachers was selected. In this study, a random selection of teachers from a well-defined population was considered. In the case of the study by Toledo and Maldonado (2005), this method is not used, they made a non-probabilistic selection of teachers. A larger random sample will allow us to better explore the sign of these indicators.

The internal consistency of the adapted instrument was measured through the Cronbach's alpha coefficient with a value of 0.9551, evidencing a high degree of reliability. This made possible to conclude that the adapted instrument verified the psychometric properties of validity and reliability, which will allow to measure information literacy in teachers of Public Technological Institutes of Higher Education. This study may as well be used to guide the policies of higher educational institutions, which want to improve information management in their teachers.

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