

Validation of an instrument on information skills

Validación de un instrumento sobre habilidades informativas

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ABSTRACT

Keywords

Library skills;
information literacy;
information skills;
evaluation instrument;
validation instrument

In order to provide a reliable resource that helps information professionals who provide their service in libraries to take concrete actions in the training and training of their users, an instrument to measure informative skills has been developed and validated in an educational institution. When considering the results of the study, it is determined that the instrument has a very good validity ($KMO = .906$, $\chi^2 = 1959.102$, $gl = 378$, $p = .000$, explained variance = 67.601%). Cronbach's alpha coefficient showed a very good degree of internal consistency ($\alpha = .958$). Considering the results of the quantitative analysis and the intervention of the experts, a solid support of the five dimensions that make up the instrument can be observed. The proposed instrument offers the possibility of assessing different vital aspects related to the training of users, the offer and use of library services and intervention activities that will literate the university community.

RESUMEN

Palabras clave

Habilidades
informativas;
formación de usuarios;
alfabetización
informativa;
instrumentos de
evaluación; validación
de instrumentos

Con el propósito de proveer un recurso fiable que ayude a los profesionales de la información que prestan su servicio en bibliotecas a tomar acciones concretas en la capacitación y formación de sus usuarios, se ha desarrollado y validado un instrumento para medir las habilidades informativas en una institución educativa. Al considerar los resultados del estudio, se determina que el instrumento tiene una validez muy buena ($KMO = .906$, $\chi^2 = 1959.102$, $gl = 378$, $p = .000$, varianza explicada = 67.601%). El coeficiente alfa de Cronbach mostró un grado de consistencia interna ($\alpha = .958$) elevado. Al tomar como referencia los resultados del análisis cuantitativo y la intervención de los expertos, se observó un respaldo sólido de las cinco dimensiones que componen el instrumento. El instrumento propuesto ofrece la posibilidad de valorar diferentes aspectos vitales relacionados con la formación de los usuarios, la oferta y el uso de los servicios bibliotecarios, así como las actividades de intervención que alfabetizarán a la comunidad universitaria.

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INTRODUCTION

The purpose of this study was to validate and develop an instrument to assess the informational skills of users of a university library. The results show that the final structure of the instrument may be configured in five dimensions with a total of 28 items.

Information and knowledge are key elements for the operation of a university system. Actions related with information and knowledge, regarding the management of contents, quantity, quality, present time, pertinence, acquisition and communication, have an essential role in the improvement of the quality of higher education (Lay & Wei, 2013). Furthermore, continuing education and instruction of the user is an opportunity for the development of skills to handle resources.

To a certain extent, an information-literate university may be in different instances. When considering the guiding instrument of Webber & Johnston (2000), the institution may be in an embryo phase, the intermediate stage or in the good path towards an information-literate university. These authors say that one of the primordial objectives in the development of information skills is that users know their limitations and acknowledge the needs for information and therefore, acquire the ability to locate, evaluate and efficiently use the information retrieved and required; the basis to learn of any professional is projected towards the promotion of access and management aptitudes of information obtained.

Literate people are users who have had training in the professional handling of information, they have learned to obtain knowledge, they know how to search, retrieve and create information for the educational field, as well as for other areas of life. Information literacy is not only a need, but also a basic human right, therefore, it is necessary to encourage informational skills (Sturges & Gastinger, 2012).

At the new challenges, the role of a library in the timely use of information is the basis for continuing learning, dubbed in the academic world as informational skills, which may be assessed in every discipline of knowledge in any educational level (Aslam, 2018). Here, we present the validation of an instrument in the Latin American context with the purpose of measuring and assessing informational skills to manage knowledge.

Informational skills

At the relevance of promoting and fostering the development of informational skills in a comprehensive manner, some authors significantly emphasize on the diverse individual and institutional initiatives, among which we may quote blogs, webpages, tutorials and e-publications. These efforts have been rewarded by the process to generate new knowledge (Barbosa, Marciales & Castañeda, 2015; Díaz, 2012; Funes, 2017; García & Díaz, 2007; Goodall & Pattern, 2011).

To Allison (2015), a competent person in accessing and using information ought to be capable of identifying the information he/she needs, of accessing it with efficacy and efficiency, of making a critical evaluation of the information and its sources, as well as of determining the scope of the information he/she requires. To Fujii (2007), the development of informational skills is a set of actions to reflectively use and with the intent of disposing of retrieved information. This actions include search processes, collection, evaluation, use and communication of the information by different media and formats.

Literature review

Diaz (2012) affirms that the topic of skills arises from educational institutions from essential facts: to manage that students achieve knowledge, skills and attitudes necessary required by society. Therefore, educational institutions ought to prepare students to face the current reality, where developing skills to handle information resources with greater efficiency is necessary.

It is the responsibility of educational institutions and, specifically, of their libraries, to implement programs for the development of informational skills required by their users, that are part of the necessary skills to handle information resources. Bundy (2003) highlights the fact that, informational skills, are necessarily shown within a context and within the mastery of contents.

To Obasuyi & Fredrick (2015), implementation of programs for the development of informational skills demands planned practice, based on facts and theories that gather systematic and sequential activities. In accordance with Lay & Cortes (2009), it is the responsibility of librarians to contribute to the educational process of students aimed to improve or foster the skills and knowledge to

take them to the level of self-learning. Thus, informational skills turn into a key factor to increase the efficacy of the teaching-learning process. For this reason, educational institutions ought to assume their commitment and not ignore the promotion of these competencies among all the users (Marzal *et al.*, 2011).

Hernández (2013), Juznic & Urbanija (2003), Naranjo (2005) and Pirela & Cortés (2014) present the guidelines for literacy and the development of skills as principles that frame basic standards that underline the acquisition, comprehension and application of information literacy for an individual.

Clavero, Codina & Perez (2010) hold that universities and other educational institutions are greatly responsible for fostering informational skills of users. In view of this, standards, criteria and methods have been set to keep an order and to achieve a greater approach in training these competencies.

Lack of informational skills may cause that students, overwhelmed by the amount of information, get lost when doing any search. This lack may also limit the capacity of users to face new situations in the processes to select reliable sources and to know how to use them properly. Bruce (2003) says that information literacy ought to include full experience with different dimensions to handle the information. Indeed, users are greatly responsible for their own instruction and learning throughout their life in their areas of concern, both personal and professional, but a professional's responsibility for information and that of the library's is the basic foundation to establish the initial platform in their education. It is necessary to teach them how to browse the network and other specialized sources so that they learn specific retrieving strategies (Garcia & Diaz, 2007).

The purpose of this study is to validate an instrument to assess the informational skills of individuals for the improvement of the quality of higher education in the Latin American context.

Initial approximation to the informational skills instrument

In this article, an instrument is proposed and validated intended to identify the level of informational skills of a specific population of study. In accordance with some researchers (Barbosa *et al.*, 2010), the following are informational skills: to recognize the need to have

information, to determine the scope of required information, to access information with efficacy and efficiency, to analyze and evaluate information and its sources, to incorporate selected information to his/her own knowledge base, and to use the information in an efficient manner and to respect its authorship.

There are five dimensions in the proposed construct in this research:

- The need for information: the user is capable of recognizing the need for information and to determine the nature thereof.
- Searching and retrieving information: the user is capable of accessing information with efficacy and efficiency when using tools or methods to obtain it.
- Evaluating sources: the user is capable of evaluating information and its sources in a critical manner, and knows how to incorporate the selected information to his/her own knowledge base.
- Use of the information: the user is capable of using the information sensibly, and of recognizing problems and cultural, ethical, legal and social aspects implied for the use thereof.

METHODOLOGY TO PREPARE THE INSTRUMENT

An instrument is a variable in a study. On our study, informational skills are the variable. Boh *et al.* (2016) considering that there are variants on the use of the concept in different countries, which may be used in a different manner. Among these concepts, we can mention information literacy, informational literacy, literacy in information, informational skills, informational competencies, and competencies in information.

In this study, informative skills are understood as the process to develop media skills to filter and value the information a user receives by means of multiple channels and produce, in turn, skills growth, capacities or competencies in information intended to educate literate people on the use of information (Lay & Cortes, 2009; Cuesta *et al.*, 2014; Kurbanoglu, Akkoyunlu & Umay, 2006; Ferrer, 2012).

The instrument which was applied as a pilot test to a population was as follows: virtual mode students, pre-degree 12%, post-degree 17%, and teachers 13%; and in-classroom students, pre-degree 21%, post-

degree 33%, and external teachers 4%. The non-probabilistic sampling technique was used for convenience because the subjects were selected by their ease of recruitment, and the researcher did not consider inclusion characteristics which make them representative of the whole population.

Preparation of this instrument was subjected to the following process:

- First off, we built the theoretical framework by analyzing and reviewing different studies addressing the topic, as well as the variations thereof and measurement indicators.
- We established a conceptual definition of the variable of the study in accordance with the literature.
- Upon analyzing the variable, indicators or criteria were chosen for each of the dimensions to be studied.
- 36 items were proposed and drafted, which were analyzed by experts in the area with a specialty in computer sciences. From this analysis and evaluation, eight items were removed and, in turn, adjustments were made of the wording in other ten. The structure and clarity of the statements were refined for better understanding of the participants. The instrument comprised 28 items.
- Clarity and pertinence were evaluated by seven experts with academic training in the specialty of computer sciences and wide professional experience in library management; the five-level Likert scale was used: never, irrelevant (1), a few times, irrelevant (2), occasionally (3), almost always, relevant (4) and always, relevant (5). A very good score was obtained for clarity ($M = 4.55$). pertinence considered by experts also was very good ($M = 4.75$).
- We administered a pilot test ($n = 101$) to students of different bachelor's degrees, teachers of other universities and personnel of some libraries in Mexico to verify whether the indicators were clear and could be understood.
- Statistical techniques were verified to determine validity (factors analysis) and reliability (Cronbach's alpha) of the instrument.

RESULTS: VALIDATION OF THE CONSTRUCT

In the construct validation process, information obtained from the pilot test was used ($n = 101$), virtual mode students participated (UMVirtual) and students in the last semester of the different bachelor studies of a northeastern university of Mexico, teachers from other universities and personnel of some libraries in Mexico.

Validity of the instrument was then verified by using the factor analysis technique, it was configured means of the main components extraction method with an exploratory approach for a set number of values and varimax rotation to determine whether the five proposed dimensions were relevant. The results were as follows:

- Sample adequacy and Bartlett's sphericity. The set of data used with this technique resulted in ($KMO = .906$, $\chi^2 = 1959.102$, $gl = 378$, $p = .000$) which was relevant to do the factor analysis. In accordance with Perez (2004), this was considered as a good adequacy of the sample to the analyzed factors model.
- Total variance explained. As part of the factor analysis, by the main components extraction method, we performed a confirming analysis with five factors, which resulted in a very good total explained variance ($\sigma^2 = 67.601\%$).
- Commonality. We called commonality to the proportion of the variance explained by common factors in a variable. Commonality is the sum of factor weights square of each of the lines. Thus, the commonality values ($Com_{min} = .504$, $Com_{max} = .755$) are greater than the extraction criterion ($Com = .300$). Therefore, it has been determined that the 28 indicators in the questionnaire meet the requirement of commonality.

By means of the confirmatory factor analysis, the final version of the instrument was completed, with its respective factor loading, as presented in table 1.

Table 1. Factor weighing per item

Item	Component				
	1	2	3	4	5
NEIN07 7. I am capable of identifying information I need	.749				
NEIN09 9. The objective is clear to me when I do a search	.745				
NEIN05 5. I can consult and use electronic information sources	.696			311	
NEIN06 6. I can evaluate the quality of the resources of information	.680	.396			
NEIN12 12. I know how to identify the main ideas in a document	.672		.424		
NEIN13 13. I can evaluate the quality of sources of information	.659	.364	.333		
NEIN08 8. I know how to use printed information sources in the process of a research (for example, books)”	.591	.467			
NEIN03 3. I can define the level of depth of the content I want to obtain	.558			.390	.393
NEIN15 15. I can summarize and schematize the information	.500			.356	.430
BRIN27 27. I know and apply laws on the use of information and intellectual property		.745			.301

BRIN10 10. I know the typology of scientific information sources (for example, doctoral thesis, and records of conferences)	.360	.684			
BRIN04 4. I know how to access and use automated catalogs		.614		.408	
BRIN16 16. I know how to use bibliographic reference managers (for example, Zotero, RefWorks, Citavi or Mendeley)		.597		.363	.378
BRIN17 17. I am capable of determining whether the information contained in a resource is updated	.332	.560			.473
BRIN01 1. I know the terminology of the area of knowledge where I search for information	.464	.556			
BRIN11 11. I know the most relevant authors or institutions in the field of the topic I am researching for		.499		.367	
USIC24 24. I know how to adequately disseminate information on the web (for example, web, blogs or conferences)		.317	.770		
USIC23 23. I can make academic presentations using computer programs (for example, PowerPoint)			.742		
USIC25 25. I can communicate results and conclusions to the public			.649	.347	
USIC20 20. I know how to draft a document (for example, a report or an academic work)			.617		.420

USIC26 26. I handle different quoting styles		.446	.545	.473	
USIC21 21. I know how to prepare bibliography in accordance with a quoting style	.357	.395	.476	.322	.325
TROR14 14. I can handle statistical programs in the course of a research				.717	
TROR22 22. I can interpret the results of a research (for example, charts and tables)	.329			.709	
TROR02 2. I can handle different strategies on the use of information	.303	.516		.576	
EFUN19 19. I use the information, bearing in mind respect of copyrights					.822t
EFUN18 18. I am capable of recognizing the structure of a text	.334	.406			.491
EFUN28 28. I know the code of ethics in my academic/professional field				.389	.473

Instrument structure

The instrument on informational skills comprised 28 items, divided in five dimensions:

The need-for-information dimension comprised nine items (7, 9, 5, 6, 12, 13, 8, 3 and 15), which pertain to the statements: “I am capable of identifying information I need”, “the objective is clear to me when I do a search”, “I can consult and use electronic information sources”, “I know how to identify the main ideas in a document”, “I can evaluate the quality of the resources of information”, “I know how to use printed information sources in the process of a research (for example, books)”, “I can define the level of depth of the content

I want to obtain”, and “I can summarize and schematize the information”.

The search and retrieve dimension was represented by seven items (27, 10, 4, 16, 17, 1 and 11), that deal with the statements: “I know and apply laws on the use of information and intellectual property”, “I know the typology of scientific information sources (for example, doctoral thesis, and records of conferences)”, “I know how to access and use automated catalogs”, “I know how to use bibliographic reference managers (for example, Zotero, RefWorks, Citavi or Mendeley)”, “I am capable of determining whether the information contained in a resource is updated”, “I know the terminology of the area of knowledge where I search for information”, and “I know the most relevant authors or institutions in the field of the topic I am researching for”.

The use of information dimension comprised six items (24, 23, 25, 20, 26 and 21), in reference to the statements: “I know how to adequately disseminate information on the web (for example, web, blogs or conferences)”, “I can make academic presentations using computer programs (for example, PowerPoint)”, “I can communicate results and conclusions to the public”, “I know how to draft a document (for example, a report or an academic work)”, “I handle different quoting styles”, and “I know how to prepare bibliography in accordance with a quoting style”.

The organization dimension comprised three items (14, 22 and 2), pertaining to the statements: “I can handle statistical programs in the course of a research”, “I can interpret the results of a research (for example, charts and tables)”, and “I can handle different strategies on the use of information”.

The source evaluation dimension comprised three items (19, 18 and 28), in relation to the statements: “I use the information, bearing in mind respect of copyrights”, “I am capable of recognizing the structure of a text”, and “I know the code of ethics in my academic/professional field”.

Instrument reliability

One of the techniques used to measure consistency and coherence of an informational skills instrument is Cronbach’s alpha coefficient, whose value indicated the internal consistency degree ($\alpha = .958$). In accordance with Perez (2004), the result shows that the instrument

evidences uniformity. In accordance with the same author, the results for the need for information dimensions ($\alpha = .836$), search and retrieval ($\alpha = .811$), source evaluation ($\alpha = .860$), organization ($\alpha = .824$) and use of information ($\alpha = .816$), are considered to be acceptable and good.

DISCUSSION AND CONCLUSION

For the population in the study as well as for the sample obtained, in addition to taking different statistical analysis into account, the literature review and the opinion of experts in the field, this instrument is highly reliable to repeat its application, with validity of content and construct, to measure information skills in a satisfactory manner.

Taking the results of the quantitative analysis and the participation of experts as reference, we notice a strong support of the five dimensions comprising the proposed instrument. Finally, it must be mentioned that this provides the possibility to evaluate different crucial aspects related with users' information, the supply and the use of library services, as well as intervention activities to provide literacy to the university community.

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