

Un análisis sobre la percepción que los usuarios locales y externos tienen de los servicios bibliotecarios en una macrouniversidad de México

*An analysis on the perception that local and external users have of library
services in a macro University of Mexico*

*Uma análise da percepção que os usuários locais e externos têm dos serviços
bibliotecários em uma macro-universidade no México*

Elías Alvarado Lagunas

Universidad Autónoma de Nuevo León, México

eliasalvarado@gmail.com

<https://orcid.org/0000-0002-2751-7718>

Jeyle Ortiz Rodríguez

Universidad Autónoma de Nuevo León, México

jeyleortiz@gmail.com

<https://orcid.org/0000-0001-6220-7742>

Mario César Dávila Aguirre

Universidad de Monterrey, México

mario.davila@udem.edu

<https://orcid.org/0000-0003-0629-8752>

Resumen

En este artículo se presentan los resultados de un análisis de percepción del servicio bibliotecario en la Universidad Autónoma de Nuevo León (UANL), máxima casa de estudios del norte de México. Para tal fin, se empleó la encuesta semiestructurada, la cual fue aplicada a 6082 usuarios (locales y externos) que se encontraban en los distintos campus de dicha universidad. Con la información recabada se efectuó un modelo de ecuaciones estructurales, el cual sirvió para explicar la forma en que los usuarios percibían el servicio bibliotecario que se brindaba en la UANL. Los principales resultados demuestran que la mayoría de los encuestados, tanto internos como externos, tienen una

percepción positiva en las dimensiones valoradas, especialmente lo relacionado con el adecuado equipo e infraestructura física para desarrollar las actividades académicas y de investigación. En futuras investigaciones, sin embargo, se podría comparar la percepción de los usuarios de bibliotecas públicas y privadas, o de diversas regiones del país. Igualmente, se pueden ejecutar investigaciones que examinen la relación entre los hábitos de lectura de los usuarios y el espacio físico disponible en las bibliotecas, e incluso se puede profundizar en cómo la adquisición de información a través de las nuevas tecnologías influye en el uso de los espacios físicos de las bibliotecas.

Palabras clave: biblioteca, método de ecuaciones estructurales, percepción, servicio.

Abstract

This article presents the results of an analysis on users' perception of librarian service at the Universidad Autónoma de Nuevo León (UANL), considered the third largest university and university in the north of Mexico. We use data from a semi-structured survey collected in the facilities of the UANL in 2016. Structural equation modeling is used to explain the way users classify their perceptions about the service in the UANL libraries. Results indicate that UANL students give more importance to the physical space available to work in the library, such as: work tables, study rooms and cubicles. Meanwhile, for external user's library's physical equipment and general infrastructure are more important.

Keywords: library, method of structural equations, perception, service.

Resumo

Este artigo apresenta os resultados de uma análise de percepção do serviço bibliotecário da Universidade Autónoma de Nuevo León (UANL), a casa máxima de estudos no norte do México. Para tanto, foi utilizado o survey semi-estruturado, aplicado a 6082 usuários (locais e externos) que se encontravam nos diferentes campi da referida universidade. Com as informações coletadas, foi realizado um modelo de equações estruturais, que serviu para explicar a forma como os usuários percebiam o serviço de biblioteca prestado na UANL. Os principais resultados mostram que a maioria dos entrevistados, tanto internos como externos, tem uma percepção positiva das

dimensões avaliadas, principalmente relacionadas ao equipamento adequado e infraestrutura física para o desenvolvimento de atividades acadêmicas e de pesquisa. Em pesquisas futuras, no entanto, a percepção de usuários de bibliotecas públicas e privadas, ou de diferentes regiões do país, poderia ser comparada. Da mesma forma, pesquisas podem ser realizadas para examinar a relação entre os hábitos de leitura dos usuários e o espaço físico disponível nas bibliotecas, e podemos até mesmo aprofundar como a aquisição de informações através de novas tecnologias influencia o uso de espaços físicos das bibliotecas.

Palavras-chave: biblioteca, método de equações estruturais, percepção, serviço.

Fecha Recepción: Agosto 2018

Fecha Aceptación: Enero 2019

Introduction

Currently, the provision of a good library service requires not only having a well-selected and organized collection or having avant-garde infrastructure and technology to search for information and knowledge (Rubin, 2004), but also requires an efficient operative and administrative staff to offer a quality service (Delgado, 2002). However, in the specific case of university libraries, these constitute an important link for the development of any country, since in these areas it is usual to keep a large amount of specialized information that is used to train new generations of professionals. In this regard, Scanlon (1984) points out that higher education institutions (HEIs) are spaces in which skills are developed and evaluative judgments schematized by those who hold the symbolic and moral power are learned.

In this sense, and for eighty years, the Autonomous University of Nuevo Leon (UANL) has been the motor of economic, social and cultural development of the state of Nuevo León (in Mexico), since it has promoted the progress of Nuevo Leon and It has become a force for peace, innovation and secure support in social issues. This has been achieved, to a large extent, thanks to the rigorous processes in which the information found in the different libraries of this house of studies is selected, acquired, stored, processed and distributed to be used in the field of teaching, research and extension.

For this reason, the purpose of this research has focused on analyzing the perception that local and external users have of the services provided in the libraries of the different campuses of

the Autonomous University of Nuevo Leon. The dimensions evaluated on the library services were the following:

1. Equipment and physical infrastructure of the facilities of the libraries (collection, bibliographic catalog, printed collections, computer equipment, among others).
2. Physical space available in the library (work tables, rooms and study cubicles).
3. Service of the librarians (commitment, courtesy, dedication, promise, treatment and orientation of the librarians when attending the user).
4. Internet use measured in access to the network and digital library.
5. User reading habits.

The UANL is a public higher education institution based in the metropolitan area of Monterrey that has several campuses in several municipalities of the state of Nuevo León. This institution has been selected because, undoubtedly, it plays a very important role in the society of New Orleans. This house of studies, in fact, has the largest academic offer in the northeast of the country, and is the third largest university in Mexico, with an enrollment of approximately 174,000 students, of which 85,000 are undergraduates, 18,000 are studying Some graduate students and 71,000 are high school students. Likewise, more than 6000 teachers work in this institution, of which 623 are members of the National System of Researchers.

The UANL has 26 faculties, 29 preparatory and 37 research centers, in addition to 84 libraries, which must meet all the demand for updated and documented information from local users (students and professors) and external users (people from outside the university)¹.

Explaining the above, it is convenient to highlight that the UANL - like any other university in Mexico - invests constantly in improving its facilities (including its libraries), as well as in research, links and academic programs with the purpose of having a positive impact on the perception of its students, future students and the general population. However, it is also worth noting that despite the significant interaction between the UANL campuses or faculties, there are few studies comparing the user's perception of the services provided by the different libraries in this particular university, hence the interest of the present investigation.

¹ Cifras extraídas de la página oficial de la Universidad Autónoma de Nuevo León (fuente: www.uanl.mx).

Literature review

The theoretical discussion on the quality of library services is a topic that has had various theoretical-methodological debates, since there are different currents that can argue or support the different ways of measuring the quality and efficiency of the service provided by a library. The theoretical basis on how to measure the quality of a service is linked to the classic works of Grönroos (1982, 1984) and Parasuraman, Zeithalm and Berry (1985, 1988). These authors consider that defining and measuring the term quality in any service is not an easy task, since one of the main criticisms derives from its intangible nature. In this regard, the aforementioned researchers argue that the definition and measurement of this word can be approached from an objective and subjective approach, although in practice the latter is usually used more, since when attempting to estimate the quality of any service it is actually they usually study the value judgments of individuals.

After explaining the above, some investigations made in different countries and in Mexico are described below to identify the users' perception in the libraries of an IES. For example, Zeithaml, Parasuraman and Berry (1990) in the United States, Wilson and Town (2006) in the United Kingdom, Játiva and Gallo (2006) in Spain, and Thompson, Kyrillidou and Cook (2007) in the United States, Canada and the United Kingdom. The United States agrees that users are the "fittest" to identify needs or areas of opportunity in the infrastructure and service of libraries. To carry out their studies, these authors have mainly employed the methodology *LibQual*².

On the other hand, case studies such as those of Robbins (2004), Summers (2006) and Nava (2009), developed in Mexico, highlight that this type of work should also include the perception of employees or staff of the site, factors of great relevance to project a "good image or reputation" of the organization, because if they are satisfied with their activities, they will surely offer a better service and attention.

Consistent with this idea, authors such as Pinto, Sales and Martínez (2009) in Spain, Romero (2010) in Mexico, and Barrios and Pagán (2012) in Puerto Rico argue that the self-perception of librarians is relevant when making decisions. for the improvement of the service,

² La *LibQual+* es una herramienta que permite analizar la calidad de los servicios a partir de datos proporcionados por los usuarios. Es la adaptación del *Servqual*, desarrollado por Parasuraman *et al.* (1985) con la finalidad de crear un nuevo protocolo adaptado a las necesidades de las bibliotecas (Ferrer y Rey, 2005).

since these people know better than anyone the processes of archivology, librarianship and knowledge documentation.

Similarly, Calvert (2001) in China and New Zealand, as well as Simmonds and Andaleeb (2001) and Oakleaf (2010) in the United States add that the services offered in the university libraries are undergoing important changes that have to be managed by its staff in order to ensure the influx of users to these sites. Some of these changes have to do with the accessibility and updating of collections (conventional and digital), as well as with the service provided by the librarians. On the other hand, Jones and Madden (2002), Martell (2008), Lee (2007) and Mason (2010) in the United States, as well as Toner (2008) in the United Kingdom affirm that there is currently a continuous decline in the level of the use of university libraries due to various factors, among which are Internet access (source that now provides articles, books, magazines, etc.), the users' motivations (currently they are not attracted to these venues, since they do not have the necessary skills to investigate them), as well as the attention of the staff, among others.

However, in Mexico it can be indicated that there are few studies that, from a quantitative approach, go deeper into this topic. For example, authors such as Santiago (2003), Mendoza (2007), Arriola and Butrón (2008), Arriola (2009) and Hernández (2011) use cross-sectional analysis and apply descriptive statistics to demonstrate that users need to be motivated to access to library collections. In this sense, Toledo and Maldonado (2012) and Segoviano, Palomo and Cantú (2013) use inferential statistics to identify the factors that motivate users to use university libraries in the north of the country. These researchers use a semi-structured survey to examine psychometric properties and endogenous-exogenous components (physical space, available information, librarian skills, etc.) to quantify users' perception of the library service.

Taking as a reference the previous works, in the present study a structural equations model (SEM) has been used to identify and integrate the perceptions of UANL library users in relation to the services they provide.

Methodology

To determine the characterization and perception of the users of the UANL library services, a semi-structured survey was designed, applying the technique of direct interview to users (local and external) located in the region under study during the fourth quarter of 2016. For this, a non-probabilistic sampling was carried out that combines sampling by quotas and casual or incidental sampling.³ In total, 6082 surveys were collected in all the libraries of the different UANL campuses, which were raised inside and outside the precincts with the permission of the corresponding authorities.

The questionnaire that was applied consisted of 27 questions based and modified from the tool *LibQual*⁴; the first block focused on the general characteristics of the users (gender, age, schooling, commitment, etc.), while the second focused on the perception of library services, as well as the reasons why they decided to obtain information or visit the library; in particular, they inquired about their perception of the services demanded, the qualities and restrictions of the librarians and the infrastructure, the relevance of the bibliographic or documentary collection, etc. To measure the level of satisfaction, a Likert scale was used, whose assessment ranged from 1 to 5 (5 = totally agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, and 1 = total disagreement (see Annex 1).

Characteristics of the sample

In this section the main descriptive statistics of the general characteristics of the surveyed users are taught. The target population was all those local and external users who were in place when the survey was taken in the different libraries of the UANL campuses. It should be noted that, for reasons of space, only the findings that have been considered most relevant have been

³ El muestreo casual o incidental le permite al investigador seleccionar directa e intencionalmente a los individuos de la población que van a ser entrevistados. En cambio, el muestreo por cuotas consiste en facilitar al entrevistador el perfil de las personas que se tienen que entrevistar, de modo que queda a su criterio la elección de estas, las cuales deben tener el perfil deseado. En nuestro caso, la población objetivo estuvo constituida por todos aquellos usuarios que se encontraban en el lugar cuando se levantó la encuesta en las diferentes bibliotecas de los campus de la UANL.

⁴ Heath, Kyrillidou, Webster, Choudhury, Hobbs, Lorie y Flores (2003) y Cook, Heath, Kyrillidou, Lincoln, Thompson y Webster (2003) señalan que para medir la satisfacción de los usuarios con el servicio que prestan las bibliotecas existe un modelo de evaluación de calidad denominado *LibQUAL+*, el cual detecta la calidad de los servicios a partir de las percepciones de los usuarios. Dicho instrumento fue desarrollado por la Association of Research Libraries (ARL), y se considera una herramienta estándar para medir la calidad de los servicios a partir de las percepciones de los usuarios de las bibliotecas.

interpreted in this document; even so, the reader can visualize in a summarized way all the information collected, which is presented in each of the tables that are offered below.

In Table 1, for example, it can be seen that the surveys were applied almost equally between men and women, and that the majority of users reported being between 18 and 22 years of age. Most of these people stated that they were part of the UANL (80.2%), of which a large percentage (94.2%) was studying a degree or engineering in this house of studies. Likewise, the majority pointed out that the main reason to attend the library was the search for information for various academic activities (24.4%), to connect to the internet (22.7%) and to use the physical space (20.5%).

Tabla 1. Características generales de los usuarios internos y externos encuestados

| Concepto | Bibliotecas UANL (global) | | Usuarios locales | | Usuarios externos | |
|--|---------------------------|------------|------------------|------------|-------------------|------------|
| | Frecuencia | Porcentaje | Frecuencia | Porcentaje | Frecuencia | Porcentaje |
| Sexo | | | | | | |
| Femenino | 3197 | 52.6 | 2560 | 52.5 | 637 | 53.0 |
| Masculino | 2885 | 47.4 | 2319 | 47.5 | 566 | 47.0 |
| Total | 6082 | 100.0 | 4879 | 100.0 | 1203 | 100.0 |
| Edad | | | | | | |
| Menos de 18 años | 743 | 12.2 | 616 | 12.6 | 127 | 10.6 |
| De 18 a 22 años | 5058 | 83.2 | 4042 | 82.4 | 1016 | 84.5 |
| De 23 a 30 años | 268 | 4.4 | 208 | 4.6 | 60 | 4.9 |
| Más de 31 años | 13 | 0.2 | 13 | 0.4 | 0 | 0.0 |
| Total | 6082 | 100.0 | 4879 | 100.0 | 1203 | 100.0 |
| Escolaridad del usuario | | | | | | |
| Secundaria | 12 | 0.2 | 0 | 0.0 | 12 | 0.1 |
| Preparatoria | 64 | 1.0 | 8 | 0.2 | 56 | 4.8 |
| Licenciatura-ingeniería | 5731 | 94.2 | 4838 | 99.2 | 893 | 74.4 |
| Maestría | 243 | 4.1 | 26 | 0.5 | 217 | 18.5 |
| Doctorado | 32 | 0.5 | 7 | 0.1 | 25 | 2.2 |
| Total | 6082 | 100.0 | 4879 | 100.0 | 1203 | 100.0 |
| Motivos para asistir a la biblioteca | | | | | | |
| Amigos | 24 | 0.4 | 21 | 0.4 | 3 | 0.2 |
| Conciencia del valor de la información | 102 | 1.7 | 94 | 1.9 | 8 | 0.7 |
| Hábito de lectura | 264 | 4.3 | 232 | 4.8 | 32 | 2.7 |
| Programas de estudio | 716 | 11.8 | 417 | 8.6 | 299 | 24.9 |
| Espacio físico disponible | 1249 | 20.5 | 1051 | 21.6 | 198 | 16.4 |
| Influencia de profesores | 747 | 12.3 | 581 | 11.9 | 166 | 13.8 |
| Investigación (búsqueda de información para diversas actividades académicas) | 1486 | 24.4 | 1236 | 25.3 | 250 | 20.8 |
| Uso de internet | 1380 | 22.7 | 1157 | 23.7 | 223 | 18.6 |
| Otros | 114 | 1.9 | 90 | 1.8 | 24 | 1.9 |
| Total | 6082 | 100.0 | 4879 | 100.0 | 1203 | 100.0 |

Fuente: Elaboración propia

On the other hand, Table 2 shows the descriptive statistics of the questions that tried to determine the different attributes of the library service. In general terms, it can be seen that the best evaluated items were located within the equipment and physical infrastructure category, that is, lighting, climate and infrastructure (study rooms and cubicles), while the lowest ones were reading habits (3.34%), class material (3.22%) and reading pleasure (3.21%). Likewise, it can be pointed out that external users, in a general way, valued better the service provided by the UANL libraries

than the local ones. For the case of external users, the best evaluated attribute was the lighting item, while for the local users it was the climate (air conditioning).

Tabla 2. Preguntas sobre la percepción del servicio bibliotecario

| Variables | Total | | Usuarios locales | | Usuarios externos | |
|--------------------|----------|---------------------|------------------|---------------------|-------------------|---------------------|
| | Promedio | Desviación estándar | Promedio | Desviación estándar | Promedio | Desviación estándar |
| Infraestructura | 4.05 | .884 | 4.05 | .825 | 4.05 | .848 |
| Equipos | 3.63 | .999 | 3.58 | 1.012 | 3.64 | .996 |
| Acervo | 3.86 | .918 | 3.84 | .898 | 3.86 | .923 |
| Clima | 4.14 | .915 | 4.15 | .927 | 4.14 | .912 |
| Iluminación | 4.17 | .877 | 4.12 | .888 | 4.17 | .874 |
| Cat_biblio | 3.73 | .972 | 3.70 | .961 | 3.73 | .974 |
| Col_imp | 3.70 | .987 | 3.66 | .996 | 3.71 | .984 |
| Doc_dig | 3.59 | 1.053 | 3.55 | 1.073 | 3.60 | 1.047 |
| Salas_estudio | 3.93 | 1.075 | 3.88 | 1.084 | 3.94 | 1.073 |
| Cubículos | 3.93 | 1.092 | 3.90 | 1.115 | 3.93 | 1.086 |
| Info_errores | 3.86 | .908 | 3.86 | .893 | 3.86 | .912 |
| Promesa | 3.67 | .929 | 3.66 | .922 | 3.67 | .931 |
| Cortesía | 3.77 | .986 | 3.75 | .982 | 3.77 | .988 |
| Orientación | 3.75 | 1.007 | 3.74 | 1.022 | 3.75 | 1.004 |
| Trato | 3.68 | 1.083 | 3.64 | 1.129 | 3.69 | 1.071 |
| Accesible | 3.62 | 1.045 | 3.61 | 1.058 | 3.62 | 1.042 |
| Biblioteca_digital | 3.53 | 1.026 | 3.54 | 1.017 | 3.52 | 1.028 |
| Citas | 3.67 | 1.079 | 3.66 | 1.065 | 3.67 | 1.083 |
| Hábito_lectura | 3.34 | 1.171 | 3.35 | 1.146 | 3.34 | 1.176 |
| Placer_lectura | 3.21 | 1.310 | 3.24 | 1.297 | 3.20 | 1.313 |

Fuente: Elaboración propia

Analysis method

In order to achieve the proposed objective and to observe the current perception of the users around the UANL library service, it was necessary to make an association of the different types of variables included in the survey, that is, the equipment and infrastructure available to the library, the service of the digital library, the reading habits of the users and the competence of the librarian. This was achieved through the application of the structural equations method, which allows to test and estimate presumably causal relationships that use a combination of statistical data and causal assumptions. This procedure proposes two components: measurement and structural. The first of these, called confirmatory factor analysis (CFA), reflects the relationship between the latent

variables (constructs or factors) and the manifest indicators (observed variables), while the second projects the relationship between the latent variables.

In the first instance the AFC was carried out, which allowed to know a priori the number of factors or latent variables and establish restrictions on the elements of the load matrix. For this, a factorial analysis of main components (AFCP) was carried out. Its application allowed to distribute the twenty-seven initial questions in five groups with which approximately 63.6% of the total variability was explained, which represent the dimensions of the quality of the library service perceived by UANL users (table 3).

Tabla 3. Matriz de componentes rotados (usuarios de bibliotecas UANL)

| Componentes | 1 | 2 | 3 | 4 | 5 |
|--------------------|------|------|------|------|------|
| Infraestructura | .650 | | | | |
| Equipos | .717 | | | | |
| Acervo | .674 | | | | |
| Cat_biblio | .652 | | | | |
| Col_imp | .648 | | | | |
| Doc_dig | .671 | | | | |
| Clima | | .674 | | | |
| Iluminación | | .681 | | | |
| Salas_estudio | | .641 | | | |
| Cubículos | | .652 | | | |
| Info_errores | | | .684 | | |
| Promesa | | | .630 | | |
| Cortesía | | | .800 | | |
| Orientación | | | .809 | | |
| Trato | | | .782 | | |
| Citas | | | | .628 | |
| Hábito_lectura | | | | .874 | |
| Placer_lectura | | | | .848 | |
| Accesible | | | | | .874 |
| Biblioteca_digital | | | | | .848 |

Nota: Se han elegido los factores cuyo valor propio superó el nivel de 0.60, y para facilitar su interpretación se aplicó el método de rotación Varimax.

Fuente: Elaboración propia

In general terms, it can be argued that, given the nature of the variables, these factors or groups can be related in five dimensions of the library service:

1. Equipment and physical infrastructure of the facilities of the libraries (IN), such as the collection, bibliographic catalog, printed collections, digital documents, computer equipment, among others.
2. Physical space available in the library (EF), such as study rooms and cubicles.
3. The service of the librarians (SE), measured by the commitment, courtesy, dedication, promise, treatment and orientation of the librarians when attending the user.
4. User reading habits (HL).
5. Internet use (UI), measured by access to the network and digital library.

Identified these five dimensions, we proceeded to know the assessment made by local and external users, for which we distinguished the average ratings of the library service groups.

Tabla 4. Dimensiones percibidas

| Usuarios | Total | IN | EF | SE | HL | UI |
|-------------------|-------|------|------|------|------|------|
| Locales | 3.65 | 3.86 | 3.89 | 3.74 | 3.40 | 3.57 |
| Externos | 3.63 | 3.85 | 3.83 | 3.73 | 3.42 | 3.56 |
| Valoración global | 3.64 | 3.85 | 3.88 | 3.75 | 3.41 | 3.57 |

IN = Equipo e infraestructura física; EF = Espacio físico disponible para trabajar en la biblioteca; SE = Servicio de los bibliotecarios; HL = Hábitos de lectura; UI = Uso de internet.

Fuente: Elaboración propia

Table 4 shows that the average perception of users (overall rating) regarding the service they receive in their libraries was 3.64 on a maximum score of 5 points. That is, a value lower than the midpoint of the scale of measurement used would indicate that the evaluation of each of the attributes in the analysis of the libraries is negative. However, this result shows that the scores are similar for local and external users. It should also be noted that the dimension of service best valued for local users was the physical space available to work in the library (EF), while for external users it was physical equipment and infrastructure (IN).

After identifying the five dimensions to assess the quality of the library service in this house of studies, a model of structural equations (SEM, for its acronym in English) was applied to know how these factors or latent variables relate to each other. The most characteristic aspect of the SEM is that they start from the multiple regression methodology, although they are more rigorous in

terms of the treatment given to the interactions, nonlinear relationships, correlations between independent variables, measurement error, correlation between the terms of error, multiple independent variables measured by several indicators and consideration of latent independent variables measured by several indicators.

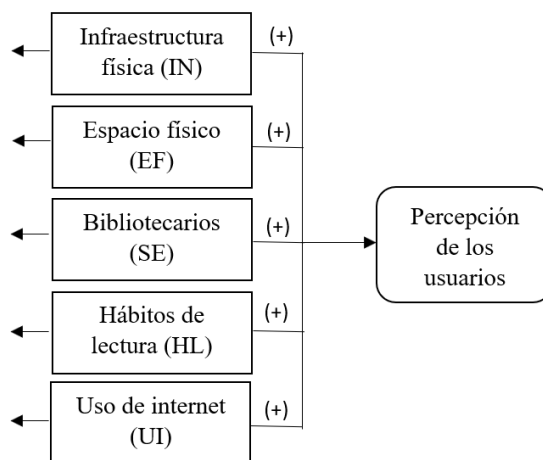
In this sense, the SEM, on the one hand, present causal relationships between a set of observable variables, and, on the other hand, between both observable and unobservable variables. In addition, they allow analyzing the behavior of variables in terms of causality, that is, they serve to know if one variable can be caused by another variable in the system or, within the same model, be the cause of another variable. Therefore, this technique is a robust alternative compared to multiple regression, trajectory analysis, time series analysis and covariance analysis in the validation of hypothetical models (Littlewood y Bernal, 2011)⁵.

The structural model that is proposed to validate is shown in Figure 1, verifying if the estimated coefficients presented in this figure are significant and do not vary for the different groups considered simultaneously. That is, it would validate which of the proposed factors are fundamental for users to build their perceptions about the quality of library services offered by the UANL.

The central hypothesis to be implemented in this model is that the estimated coefficients between the included constructs, as presented in Figure 1, are significant and do not vary for the different libraries of the UANL. In other words, there is no difference between the results of the five dimensions (IN, EF, SE, HL and UI) that are analyzed in this house of studies; In other words, the way in which both local and external users refer their perceptions regarding library services is similar.

⁵ Para un análisis más detallado del método de ecuaciones estructurales véanse los estudios de Littlewood y Bernal (2011).

Figura 1. Modelo estructural



Nota: Para valorar la fiabilidad o consistencia interna de la escala de medida del servicio bibliotecario se ha estimado, para el total de la muestra, el coeficiente alpha de Cronbach, que toma un valor de 0.922, mientras por dimensión sería el siguiente: IN (0.863), EF (0.790), SE (0.882), HL (0.761) y UI (0.799).

Fuente: Elaboración propia

However, to validate the structural model it is necessary to make some adjustment measurements. Jaccard and Choi (1996) recommend that at least three tests of the thirty that exist be consulted⁶. On the other hand, Kline (1998) proposes that at least four be consulted, which depend on the interpretation that the researcher wants to perform.

Taking the previous precaution, the present study shows the indexes that presented a better fit for the investigation (total sample of both users), since the indices for the different users (local and external) have the same pattern. The adjustment indices were the goodness-of-fit index-GFI (0.902), the comparative adjustment index-CFI (0.921), the adjusted goodness-of-fit index-AGFI (0.947) and the approximation of the mean square root of the error-RMSEA (0.059).⁷

⁶ Ji cuadrada, Ji cuadrada escalada de Satorra-Bentler, índice de bondad de ajuste (GFI), índice de bondad de ajuste ajustada (AGFI), residuales de la media de raíz cuadrada (RMS, RMSR o RMR), residual estandarizado de la raíz cuadrada media (SRMR), Hoelter N crítico, Akaike criterio de información (AIC), BICp, BCC o criterio Browne-Cudeck, ECVI o índice esperado de validación cruzada, MECVI, CVI o índice de validación cruzada, BIC o criterio bayesiano de información, parámetro de no centralidad (NCP), etc.

⁷ AGFI. Es una variante del GFI, ya que lo ajusta por sus grados de libertad: la cantidad (1-GFI) es multiplicada por la razón de los grados de libertad del modelo dividido por los grados de libertad de la línea base del modelo, entonces AGFI es 1 menos el resultado. AGFI también debe ser mayor a .90.

CFI. También se le conoce por el índice comparativo de ajuste de Bentler y compara el modelo teórico con el modelo nulo que asume que las variables latentes del modelo no se correlacionan entre sí (modelo de independencia). Eso es, compara la matriz de covarianza de datos observados con la matriz de covarianza del modelo nulo (matriz con ceros). CFI es similar a NFI, pero penaliza el tamaño de muestra. CFI y RMSEA son los estadísticos menos afectados por el tamaño de muestra, y un CFI cercano a 1.0 indica un muy buen ajuste, y valores superiores a .90 se consideran aceptables. El CFI también es usado para evaluar variables modificantes (aquellas que crean una relación heteroscedástica entre las variables independientes y dependientes, de tal manera que la relación varía por clase de modificador).

Results

The results of the analysis made with the SEM technique are presented in Figure 2, where the "exit or run" of the indicators of the structural model proposed for the total sample of users of the UANL library service is observed. It is convenient to mention that the estimations of this model were carried out with SmartPLS software version 2.0, treating the lost values with the case wise replacement option and weighting the observations with the factor weighting scheme option. Likewise, to evaluate the individual reliability of each indicator, we observed the external weights and loads (outer weight and outer loadings) of the indicators with their respective construct. That is, the general rule of accepting those items with standardized charges equal to or greater than 0.60 was applied, since the latent variables that have an external weight greater than this amount turn out to be significant (see annex 2)⁸.

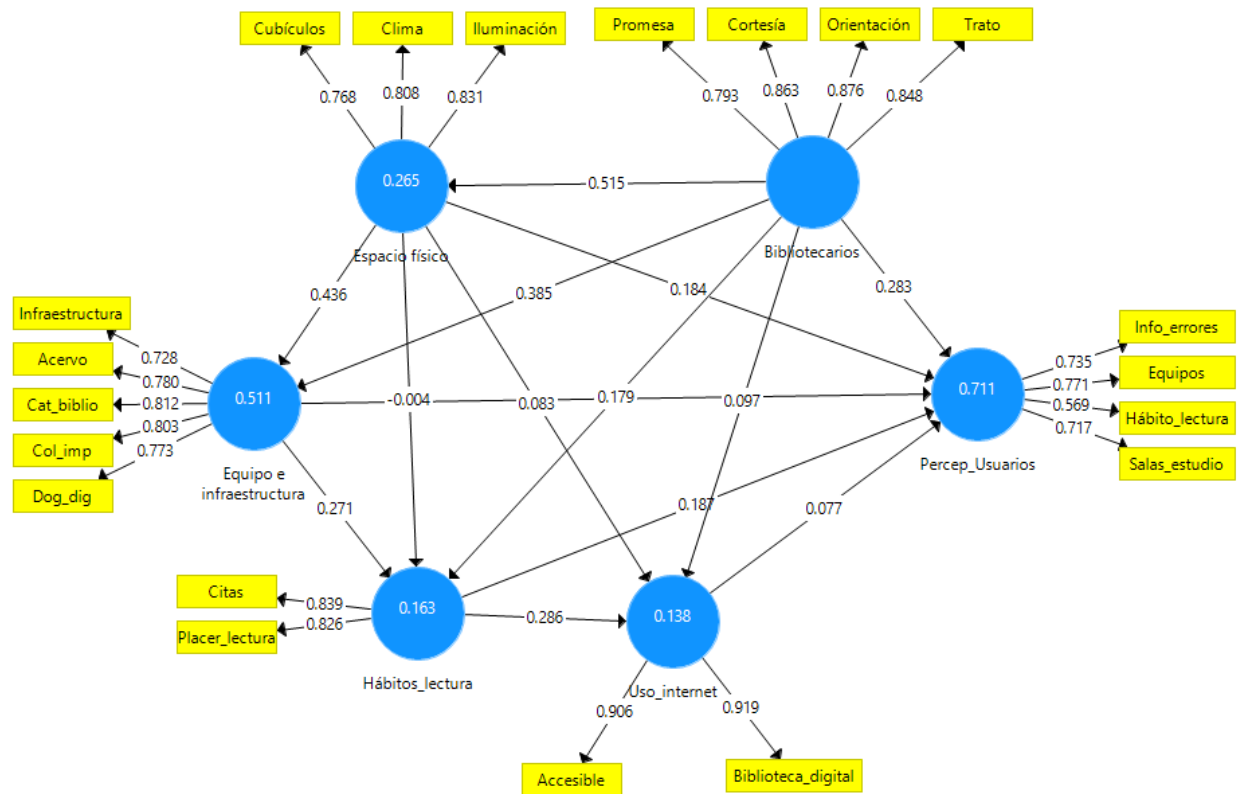
The results shown in figure 2 serve not to reject the central hypothesis of the study, that is, it is evident that the direct and indirect relationships between the latent variables that exist in the users are similar; For example, the direct effect of having the equipment and avant-garde facilities in libraries (IN) positively and significantly influences the perception of the physical space in general to work or develop academic activities in libraries (EF) with 43.6%. However, having an EF does not impact too much with the habit of reading (HL), since it has an effect of only 0.4%. Even so, SEs impact 17.9% on reading habits (HL). In addition, if the latter improvement can increase its use (UI) up to 28.6%. Therefore, it is evident that there is a correlation between the five groups (IN, EF, SE, HL and UI), and the perception -be it good or bad- can alter another; for example, the one in the IN could indirectly affect the dimensions EF, SE, HL and, consequently, the UI, which would generate a dissatisfaction or negative perception of the users about the libraries of the UANL.

GFI. Se le conoce como el gamma-hat o Jöreskog-Sörbom GFI. El valor de GFI varía entre cero y uno, pero pueden obtenerse valores negativos. Una muestra grande favorece el GFI. Aunque hay analogía con R cuadrada, el GFI no puede interpretarse como el porcentaje de error explicado por el modelo. Es el porcentaje de la covarianza observada explicada por la covarianza teórica. Es un acuerdo que valores superiores a .90 apoyan el modelo.

RMSEA. Se le conoce también como RMS o RMSE o discrepancia por grado de libertad. Se considera que un RMSEA igual o menor a .08 es satisfactorio. RMSEA es un índice de ajuste popular porque no necesita compararse con un modelo nulo y tampoco requiere la propuesta de un modelo independiente. RMSEA tiene una distribución relacionada con la distribución Ji cuadrada no central y por ello no necesita de un muestro de tipo *bootstrap* para fijar intervalos de confianza.

⁸ Para un análisis más detallado del tratamiento de valores perdidos y confiabilidad de los indicadores en el modelo estructural véase el estudio de Henseler, Ringle y Sinkovics (2009).

Figura 2. Resultados del modelo estructural (muestra total)



Nota: Cabe resaltar que antes de analizar el modelo estructural, así como la fiabilidad y la validez de este modelo de medida, se optó por establecer el de mejor ajuste (figura 2). La fiabilidad de cada una de las variables fue evaluada con la examinación de las cargas o correlaciones simples de las medidas o indicadores con sus respectivas variables latentes, es decir, en el modelo propuesto se aprecia que los indicadores tienen una carga aceptable, ya que la mayoría tiene cargas mayores a 0.70.

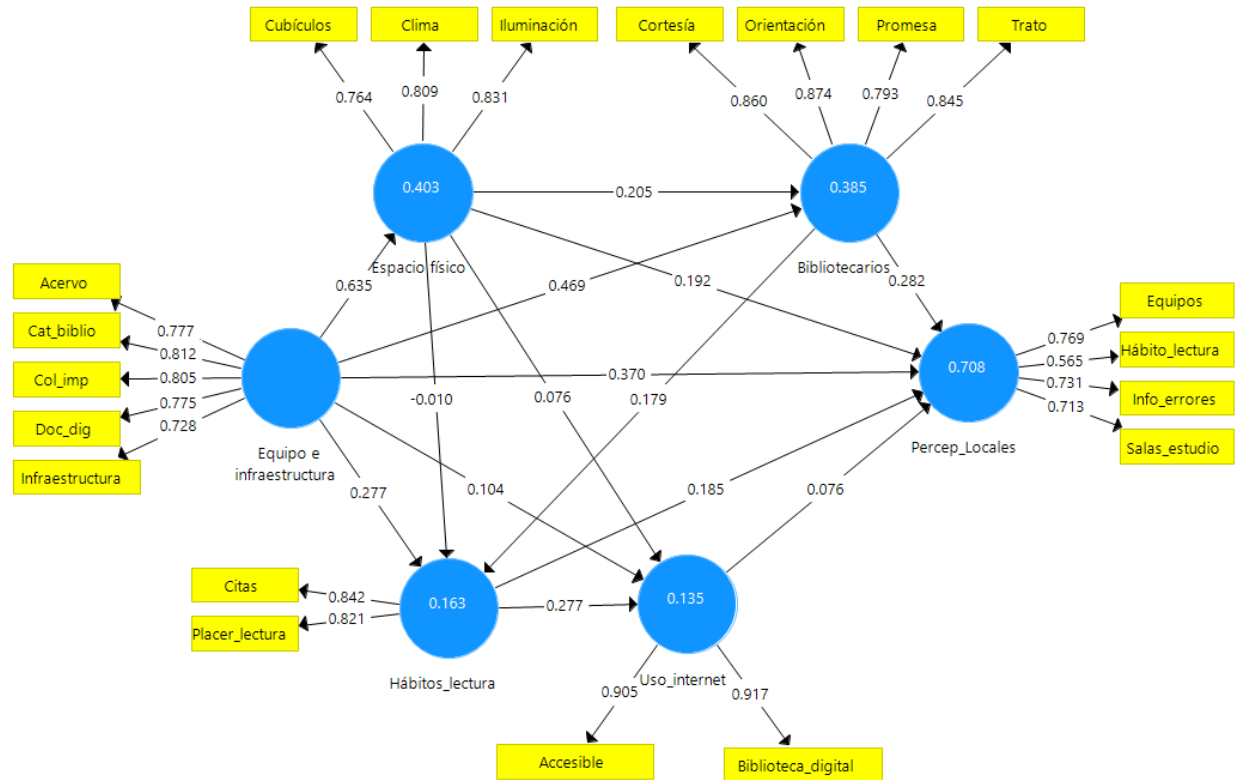
Fuente: Elaboración propia

In general, it can be stated that the variables with the most impact (from highest to lowest degree) on the perception of library services in the sample collected were the service provided by librarians (28.3%), reading habits (18.7%), the physical space available to work in the library (18.4%), the equipment and physical infrastructure (17.9%) and the use of the internet (7.7%). Undoubtedly, these five dimensions show a positive perception (satisfaction) of the users when receiving the service within the library in this house of studies. Therefore, it can be concluded that the perception of users is highly explained by these five factors, since the R² obtained was 0.711.

On the other hand, regarding the subsamples, Figure 3 presents the results of the structural model for local users; This figure shows that the equipment and infrastructure of the libraries of this macro-university are factors that significantly influence the satisfaction of local students (37%). Similarly, the service and attention provided by the librarians becomes an element of great

relevance to increase the use and level of student satisfaction (28.2%). In this sense, the R² obtained for this subsample was .708.

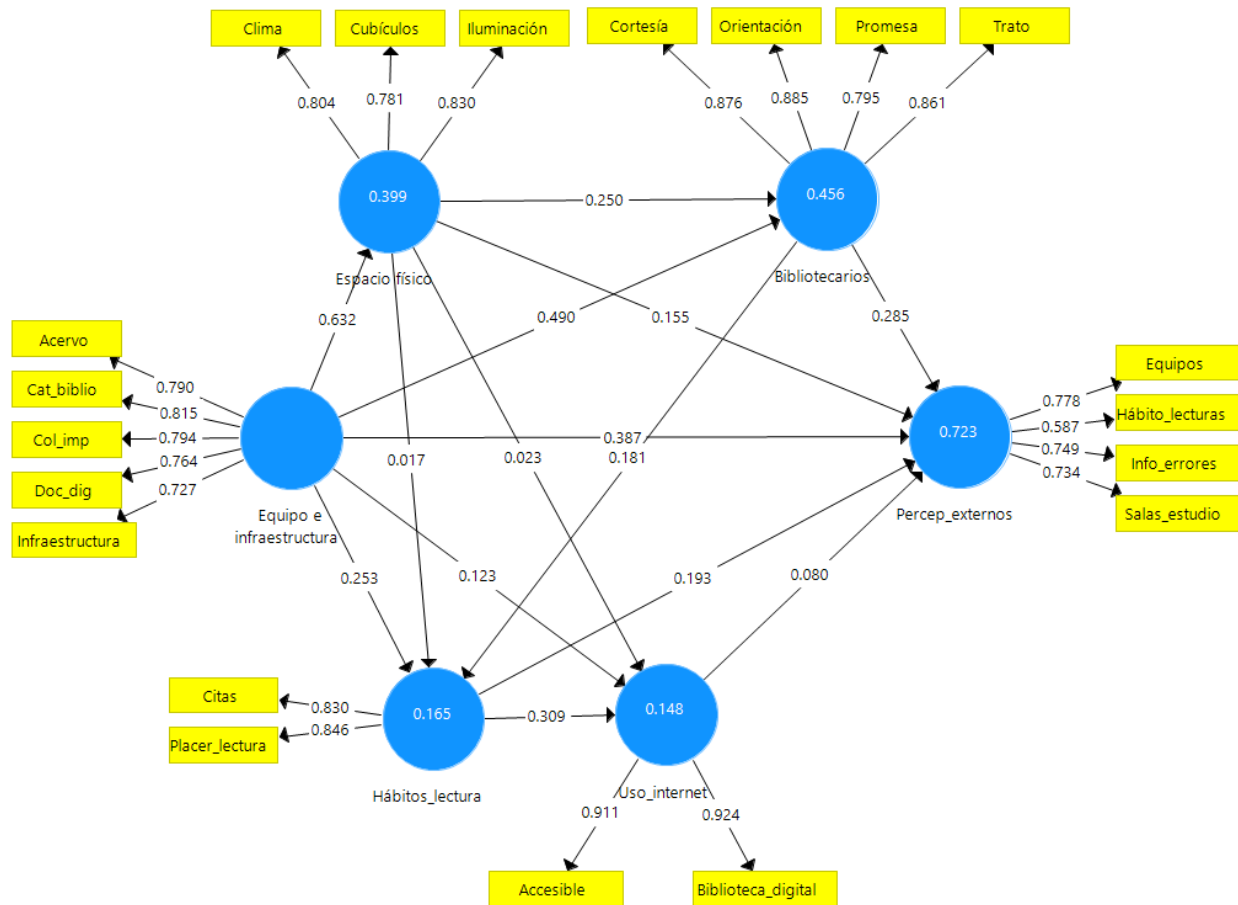
Figura 3. Resultados del modelo estructural de la submuestra de los usuarios locales



Fuente: Elaboración propia

Finally, Figure 4 shows that the factors with the greatest impact on the perception of external users were (from greater to lesser degree) the equipment and infrastructure (38.7%), the librarians service (28.5%), the reading habits (19.3%), physical space (15.5%) and internet use (8%). In summary, these five dimensions explain positively the degree of satisfaction with the services provided by the libraries of this macrouniversity (the R² obtained was from .723).

Figura 4. Resultados del modelo estructural de la submuestra de los usuarios externos



Fuente: Elaboración propia

Conclusions

Using a survey applied to 6082 users of libraries at the Autonomous University of Nuevo Leon (UANL) and using a structural equation model (SEM), in this work we could analyze the quality of the library service provided in that university. . In this sense, it can be affirmed that the majority of respondents, both internal and external, have a positive perception of the valued dimensions, especially in relation to the adequate equipment and physical infrastructure to develop academic and research activities.

On the other hand, and despite the fact that the technique used may lack predictive power, it turned out to be a valid procedure to select, from the perspective of the users, those variables that

had certain significant relationships with the perception about the library service in the UANL. It should also be mentioned that although we have tried to develop a rigorous work with regard to the application of the SEM, we are aware of the limitations and opportunities for improvement, for example, in the use of probabilistic sampling.

Even so, this investigation opens the doors for future lines of research, which can be focused on comparing the perception of users of public and private libraries, or of different regions of the country. Similarly, research can be carried out to examine the relationship between users' reading habits and the physical space available in libraries. It was also possible to deepen in how the acquisition of information through the new technologies influences the use of the physical spaces of the libraries in their different campuses.

In addition, it is considered pertinent to consider the following recommendations that arise from this study. For example, in relation to the dimension of physical infrastructure, it would be convenient for macrouniversities to implement an institutional program related to the curricula of all their faculties to encourage the consultation of the material that lies in said precincts, as well as to promote activities to develop the reading habits.

References

- Arriola, O. (2009). Una caracterización de la biblioteca universitaria actual. *Revista Códice*, 5(2), 113-131.
- Arriola, O. y Butrón, K. (2008). Un acercamiento a la evaluación de bibliotecas. *Biblioteca Universitaria*, 11(2), 99-114.
- Arriola, O. y Yáñez, B. (2008). La cultura bibliotecaria del usuario de bibliotecas académicas: un panorama de su realidad. *VI Coloquio Administración y Liderazgo en el Campo Informativo*. Recuperado de <http://eprints.rclis.org/12530/>.
- Barrios, R. y Pagán, L. (2012). La percepción de los bibliotecarios sobre el impacto de la comunidad de práctica para la integración de tecnologías emergentes (CITE) en los servicios de información. *Simbiosis*, 9(2), 1-32.
- Calvert, P. (2001). International Variations in Measuring Customer Expectations. *Library Trends*, 49(4), 732-757.

- Cook, C., Heath, F., Kyrillidou, M., Lincoln, Y., Thompson, B. and Webster, D. (2003). Developing a National Science Digital Library (NSDL) LibQUAL+ Protocol: An E-service for Assessing the Library of the 21st Century. *NSDL Evaluation Workshop*, 1, 1-7.
- Delgado, E. (2002). *La investigación en biblioteconomía y documentación*. Guijón: Trea.
- Ferrer, A. y Rey, C. (2005). Aplicación del LibQUAL+ en el CRAI de la Universidad de Barcelona. *Jornadas Españolas de Documentación*. Recuperado de <http://diposit.ub.edu/dspace/handle/2445/11479>.
- Grönroos, C. (1982). *Strategic management and marketing in the service sector*. London: Chartwell-Bratt.
- Grönroos, C. (1984). A service quality model and its marketing implications. *European Journal of Marketing*, 18(4), 36-44.
- Heath, F., Kyrillidou, M., Webster, D., Choudhury, S., Hobbs, B., Lorie, M. and Flores, N. (2003). Emerging Tools for Evaluating Digital Library Services: Conceptual Adaptations of LibQUAL+ and CAPM. *Journal of Digital Information*, 4(2), 1-8.
- Henseler, J., Ringle, C. and Sinkovics, R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, 20, 277-319.
- Hernández, P. (2011). La importancia de la satisfacción del usuario. *Documentación de las Ciencias de la Información*, 34, 349-368.
- Jaccard, J. and Choi, W. (1996). *LISREL approaches to interaction effects in multiple regression*. Thousand Oaks, CA: Sage Publications.
- Játiva, M. y Gallo, J. (2006). LibQual+: evaluación de calidad de servicios desde la perspectiva del usuario. *Boletín de la Anabad*, 56(1), 53-74.
- Jones, S. and Madden, M. (2002). The Internet goes to college: How students are living in the future with today's technology. In *Pew Internet & American Life Project*. Retrieved from https://www.researchgate.net/publication/240317878_The_Internet_Goes_to_College_How_Students_Are_Living_in_the_Future_with_Today's_Technology.
- Kline, R. (1998). *Principles and practice of structural equation modeling*. NY: Guilford Press.
- Lee, S. (2007). *Academic library service consumer (user) motivation study based on expectancy theory* (tesis doctoral). Florida State University. Retrieved from <http://diginole.lib.fsu.edu/islandora/object/fsu%3A181523>.

- Littlewood, H. y Bernal, E. (2011). *Mi primer modelamiento de ecuación estructural LISREL*. Monterrey, México: ITESM.
- Martell, C. (2008). The Absent User: Physical Use of Academic Library Collections and Services Continues to Decline 1995-2006. *The Journal of Academic Librarianship*, 34(5), 400-407.
- Mason, M. (2010). *Myths associated with undergraduate use of academic libraries*. Retrieved from <http://www.moyak.com/papers/academic-library-anxiety.html>.
- Mendoza, G. (2007). *El proceso de trabajo de participativo en la planeación de la evaluación de bibliotecas universitarias: estudio del caso SUBA-UACH* (tesis de maestría). Colegio de México. Recuperado de <http://eprints.rclis.org/12217/>.
- Nava, A. (2009). *Elementos a considerar en la motivación del personal en las bibliotecas* (tesis de licenciatura). Universidad Nacional Autónoma de México. Recuperado de <http://www.filos.unam.mx/LICENCIATURA/bibliotecologia/textos-apoyo-docencia/nava-olmos-anastasia.pdf>.
- Oakleaf, M. (2010). The value of academic libraries: A comprehensive research review and report. In *Association of College and Research Libraries*. Retrieved from http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/value/val_report.pdf
- Parasuraman, A., Zeithalm, V. and Berry, L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49(4), 41-50.
- Parasuraman, A., Zeithalm, V. and Berry, L. (1988). Servqual: a multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12-40.
- Peña, D. (2002). *Análisis de datos multivariantes*. Madrid: McGraw-Hill/Interamericana.
- Pinto, M., Sales, D. y Martínez, P. (2009). El personal de la biblioteca universitaria y la alfabetización informacional: de la autopercepción a las realidades y retos formativos. *Revista Española de Documentación Científica*, 32(1), 60-80.
- Robbins, S. (2004). *Comportamiento organizacional*. México: Pearson Educación.
- Romero, E. (2010). El bibliotecólogo ante una comunidad de universidades privadas del Distrito Federal. En Lau, J. (coord.), *Evaluación del desempeño de personal bibliotecario* (pp. 259-292). Buenos Aires: Alfagrama Ediciones.
- Rubin, R. (2004). *Foundations of Library and Information Science*. Nueva York, Nueva York: Neal-Schuman Publishers.

- Ruiz, M., Pardo, A. y San Martín, R. (2010). Modelos de ecuaciones estructurales. *Papeles del Psicólogo*, 31(1), 34-45.
- Santiago, L. (2003). Necesidades y comportamiento informativo en usuarios externos de una biblioteca universitaria. *Revista de Ciencias Bibliotecología y de la Información*, 1(1), 12-36.
- Scanlon, P. (1984). *Un enclave cultural. Poder y etnicidad en el contexto de una escuela norteamericana en México*. México: Ediciones de la Casa Chata.
- Segoviano, J., Palomo, M. y Cantú, J. (2013). Factores endógenos y exógenos que impactan en el uso de la biblioteca en tres universidades del área metropolitana de Monterrey, Nuevo León. *Revista Investigación Bibliotecológica*, 27(61), 53-81.
- Simmonds, P. and Andaleeb, S. (2001). Usage of Academic Libraries: The Role of Service Quality, Resources and User Characteristics. *Library Trends*, 49(4), 626-634.
- Summers, D. (2006). *Administración de la calidad*. México: Editorial Pearsons.
- Thompson, B., Kyrillidou, M. and Cook, C. (2007). User library service expectations in health science vs. other settings: a LibQUAL+ study. *Health Information and Libraries Journal*, 24, 38-45.
- Toledo, M. y Maldonado, S. (2012). Propiedades psicométricas de una adaptación de LibQUAL+. Un estudio en bibliotecas de universidades mexicanas. *Biblios*, 49, 1-13.
- Toner, L. (2008). Non-use of Library Services by Students in a UK Academic Library. *Evidence Based Library and Information Practice*, 3(2), 18-29.
- Wilson, F. and Town, S. (2006). Benchmarking and library quality maturity. *Performance Measurement and Metrics*, 7(2), 7582.
- Zeithaml, V., Parasuraman, A. and Berry, L. (1990). *Delivering quality service: balancing customer perceptions and expectations*. New York: Free Press.

Anexo 1. Preguntas sobre la percepción del servicio bibliotecario

| Variables | Ítems |
|--------------------------|--|
| P1 = Infraestructura | ¿Las instalaciones físicas de mi biblioteca se encuentran en buen estado? |
| P2 = Equipos | ¿El equipamiento (mobiliario, estantes, decoración, equipos informáticos y audiovisuales) de mi biblioteca parece moderno? |
| P3 = Acervo | ¿Cómo calificaría los libros, revistas y material relacionado con la enseñanza en su biblioteca? |
| P4 = Clima | ¿Cuáles son las condiciones en las que opera el aire acondicionado en mi biblioteca? |
| P5 = Iluminación | ¿Cómo calificaría el grado de iluminación en las instalaciones de su biblioteca? |
| P6 = Cat_biblio | ¿Cómo calificaría el catálogo bibliográfico (actualizado) que posee la biblioteca de su facultad? |
| P7 = Col_imp | ¿Es fácil encontrar información en las colecciones impresas de la biblioteca? |
| P8 = Doc_dig | ¿Su biblioteca contiene documentos digitales actuales y confiables? |
| P9 = Salas_estudio | ¿Su biblioteca tiene espacios adecuados para estudiar en equipos (salas de estudio)? |
| P10 = Cubículos | ¿Su biblioteca tiene espacios adecuados para estudiar de manera individual (cubículos)? |
| P11 = Info_errores | El grado en el que los bibliotecarios se preocupan por mantener la información sin errores (libros adecuados correctamente en sus estantes, avisos de salas o cubículos disponibles, etc.) es: |
| P12 = Promesa | El grado en el que cumplen en mi biblioteca cuando prometen adquirir (comprar) un libro o material didáctico solicitado en cierto tiempo es: |
| P13 = Cortesía | El grado en el que los bibliotecarios responden satisfactoriamente a mis preguntas es: |
| P14 = Orientación | El grado en que los bibliotecarios me orientan en el uso de la biblioteca es: |
| P15 = Trato | Busco la ayuda del bibliotecario por su trato amable. |
| P16 = Obligación | El grado en el que asisto a la biblioteca es porque mis profesores me lo solicitan: |
| P17 = Accesible | La información de la biblioteca es más accesible y relevante que la que encuentro en el internet. |
| P18 = Biblioteca_digital | La información de la biblioteca digital es más accesible y relevante que la que encuentro en internet. |
| P19 = Citas | Cuando elaboro tareas escolares en la biblioteca es más fácil citar a los autores consultados. |
| P20 = Hábito_lectura | Mi gusto personal por la lectura me lleva a asistir a la biblioteca. |
| P21 = Placer_lectura | Al año, por placer, leo al menos un libro de la biblioteca que no es parte de la carga académica. |

Fuente: Elaboración propia

Anexo 2. Resultados de las pruebas de significancia

| Constructos | Ítems | Outer Loadings (Outer Weights) | Error estándar | Nivel de significancia | Intervalos de confianza ^{a/} |
|-------------------------------|--------------------|-----------------------------------|-------------------|---------------------------|--|
| IN | Infraestructura | 0.726 (0.258) | 0.056 | *** | [0.633, 0.818] |
| | Acervo | 0.779 (0.254) | 0.047 | ** | [0.701, 0.856] |
| | Cat_biblio | 0.813 (0.262) | 0.038 | *** | [0.750, 0.875] |
| | Col_imp | 0.805 (0.258) | 0.054 | *** | [0.715, 0.894] |
| | Doc_dig | 0.774 (0.248) | 0.080 | *** | [0.642, 0.906] |
| EF | Cubículos | 0.787 (0.443) | 0.050 | *** | [0.704, 0.869] |
| | Clima | 0.808 (0.387) | 0.052 | *** | [0.722, 0.893] |
| | Iluminación | 0.831 (0.416) | 0.042 | *** | [0.761, 0.900] |
| SE | Promesa | 0.794 (0.317) | 0.040 | *** | [0.728, 0.860] |
| | Cortesía | 0.862 (0.289) | 0.033 | *** | [0.807, 0.916] |
| | Orientación | 0.876 (0.292) | 0.026 | *** | [0.833, 0.918] |
| | Trato | 0.848 (0.285) | 0.040 | *** | [0.782, 0.914] |
| HL | Citas | 0.893 (0.601) | 0.050 | *** | [0.810, 0.975] |
| | Placer_lectura | 0.832 (0.600) | 0.051 | *** | [0.747, 0.916] |
| UI | Accesible | 0.906 (0.527) | 0.038 | *** | [0.843, 0.968] |
| | Biblioteca_digital | 0.919 (0.568) | 0.030 | *** | [0.869, 0.968] |
| Percepción de los usuarios | Info_errores | 0.690 (0.314) | 0.064 | *** | [0.584, 0.795] |
| | Equipos | 0.718 (0.315) | 0.065 | *** | [0.610, 0.825] |
| | Mejorar | 0.654 (0.286) | 0.081 | *** | [0.520, 0.787] |
| | Hábito_lectura | 0.630 (0.276) | 0.342 | * | [0.457, 0.775] |
| | Salas_estudio | 0.682 (0.291) | 0.080 | *** | [0.550, 0.814] |

*p < .10. ** p < .05. *** p < .01.

^{a/} Bootstrap confidence intervals for 10% probability of error ($\alpha = 0.10$).

Fuente: Elaboración propia

| Rol de Contribución | Autor (es) |
|--|---|
| Conceptualización | ELÍAS ALVARADO LAGUNAS, JEYLE ORTIZ RODRÍGUEZ (IGUAL). |
| Metodología | ELÍAS ALVARADO LAGUNAS |
| Software | ELÍAS ALVARADO LAGUNAS, JEYLE ORTIZ RODRÍGUEZ (QUE APOYA). |
| Validación | ELÍAS ALVARADO LAGUNAS |
| Análisis Formal | ELÍAS ALVARADO LAGUNAS, JEYLE ORTIZ RODRÍGUEZ (IGUAL). |
| Investigación | MARIO CÉSAR DÁVILA AGUIRRE |
| Recursos | MARIO CÉSAR DÁVILA AGUIRRE |
| Curación de datos | ELÍAS ALVARADO LAGUNAS |
| Escritura - Preparación del borrador original | ELÍAS ALVARADO LAGUNAS, MARIO CÉSAR DÁVILA AGUIRRE (IGUAL). |
| Escritura - Revisión y edición | ELÍAS ALVARADO LAGUNAS, MARIO CÉSAR DÁVILA AGUIRRE (QUE APOYA). |
| Visualización | ELÍAS ALVARADO LAGUNAS |
| Supervisión | MARIO CÉSAR DÁVILA AGUIRRE |
| Administración de Proyectos | ELÍAS ALVARADO LAGUNAS, JEYLE ORTIZ RODRÍGUEZ (IGUAL). |
| Adquisición de fondos | ELÍAS ALVARADO LAGUNAS |