RELATIONSHIP AMONG USER CHARACTERISTICS, EXPECTATIONS AND PERCEPTIONS OF LIBRARY SERVICE QUALITY USING THE ADAPTED LIBQUAL SCALE

RELAÇÃO ENTRE CARACTERÍSTICAS, EXPECTATIVAS E PERCEPÇÕES DOS USUÁRIOS SOBRE A QUALIDADE DO SERVIÇO BIBLIOTECÁRIO POR MEIO DA ESCALA LIBQUAL ADAPTADA

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ABSTRACT

This research measured the library service quality in a brazilian higher education institution, using an adapted version of LibQual scale. The sample size is 328 respondents including institution's staff and students. The hypothesis of data normality was tested with the Kolmogorov-Smirnov and Shapiro-Wilk tests and were rejected ($p < 0.05$). The software used was SPSS (version 20). Hypotheses of difference between groups were tested using the Mann-Whitney U and the Kruskal-Wallis tests. Differences in expectations and perception of quality among users of different genders are statistically significant ($p < 0.05$). The difference in perceived quality between users with different types of affiliation is also statistically significant ($p < 0.05$). Differences in expectations and perceived quality among users according to the type of previous educational institution (public or private) were not statistically significant. There are no differences among users with different frequencies of use of library services. The results found are partially in line with the literature.

Keyword: LibQual. Service Quality. Academic Library. Higher Education Institution.

RESUMO

Esta pesquisa mediu a qualidade do serviço de biblioteca em uma instituição de ensino superior brasileira, utilizando uma versão adaptada da escala LibQual. O tamanho da amostra é de 328 respondentes, incluindo funcionários e estudantes da instituição. A hipótese de normalidade dos dados foi testada com os testes de Kolmogorov-Smirnov e Shapiro-Wilk e foi rejeitada ($p < 0,05$). O software utilizado foi o SPSS (versão 20). Hipóteses de diferença entre grupos foram testadas utilizando os testes U de Mann-Whitney e Kruskal-Wallis. Diferenças nas expectativas e percepção de qualidade entre usuários de diferentes gêneros são estatisticamente significativas ($p < 0,05$). A diferença na qualidade percebida entre usuários com diferentes tipos de afiliação também é estatisticamente significativa ($p < 0,05$). Diferenças nas expectativas e qualidade percebida entre usuários de acordo com o tipo de instituição educacional anterior (pública ou privada) não foram estatisticamente significativas. Não há diferenças entre usuários com diferentes frequências de uso dos serviços da biblioteca. Os resultados encontrados estão parcialmente em linha com a literatura.

Palavra-Chave: LibQual. Qualidade de Serviço. Biblioteca Acadêmica. Instituição de Ensino Superior.

1 INTRODUCTION

The pursuit of quality in products and services should be a basic principle within organizations. The needs and expectations of the customer must be met, thereby ensuring that services continue to be provided. The assessment of service quality is perceived during the process of service delivery. Each contact with the customer is referred to as a moment of truth, an opportunity to satisfy the customer, or not. Customer satisfaction with service quality can be defined by comparing the perception of the service provided with the customer's expectations regarding it (FITZSIMMONS, J.; FITZSIMMONS, M., 2022). Among these organizations, we can emphasize the libraries of educational institutions.

Today's libraries in Brazilian educational institutions are facing various challenges, such as the advancement of technology, the increasing cost of materials, greater accessibility of research materials via the internet, and fluctuating budget allocations. Each of these challenges requires library management to pay more attention to their users' expectations. Understanding users' expectations and meeting them is the only way for libraries to retain their users. The assessment of library service quality helps identify users' needs and desires and to decrease the gap between expectations and users' perceptions. Quality evaluation also provides user feedback to improve the quality of library services (REHMAN, 2012).

Specific methods are used in Brazil to measure the performance of services offered by libraries, such as ISO 11620: 2014, Information and documentation – Library performance indicators, which proposes performance indicators that can be applied to all library profiles. Still, not all of its performance indicators can be applied to all libraries (International Standardization, 2014). Besides this standard, there are the guidelines of the International Federation of Library Associations and Institutions (IFLA), guidelines entitled Measuring quality: performance measurement in libraries, published in 2007 (POLL; TE BOEKHORST, 2007). Among the existing international instruments for evaluating the quality of library services, LibQual stands out.

In this context, the need for quality assessment of library services of the Federal Institute of Education, Science, and Technology of Santa Catarina (IFSC) is included. The institution offers courses at the following levels of education: high school, higher education and graduate studies.

In this context, the application of this research took place within the Integrated Library System of Federal Institute of Education, Science, and Technology of Santa Catarina,

currently composed of 23 libraries distributed between the Reference Center in Distance Education and Training, the 21 campuses, and the advanced Campus in São Lourenço do Oeste. The Federal Institute of Education, Science, and Technology of Santa Catarina (SIBI/IFSC) is a federal autarchy linked to the Ministry of Education (MEC) through the Secretaria of Professional and Technological Education (SETEC).

Considering the different characteristics of user profiles, the guiding question of the research is: What is the relationship between the users' characteristics with the expectation and perception of the quality of the services offered by the libraries of the Federal Institute of Education, Science, and Technology of Santa Catarina (IFSC)? Aiming to answer this question, this research aims to identify whether there are differences in expectations and perceptions of the quality of the library service of the Federal Institute of Education, Science, and Technology of Santa Catarina (IFSC) among different types of users.

This article is divided into 5 sections: the Introduction, where the research question and the objective of the research are presented, the Literature Review, where the LibQual instrument and the research related to the topic are presented, the Methodology, where the methodological procedures are described with the aim of enabling the replication of the research and promoting the transparency of methodological choices, the Results, where the results of statistical tests are presented and the findings are discussed in light of the reviewed literature, and the last section where the Conclusion of the research are presented.

2 LITERATURE REVIEW

LibQual is a rating scale based on ServQual that measures the quality of library service as perceived by library users. The development of the LibQual instrument began with indepth interviews with university library users (students and teachers) to assess their perceptions of what a library should provide (COOK *et al.*, 2001).

The latest version of the instrument, presented in Table 1, contains 22 items distributed across three dimensions: Affect of service (nine items): the human side of the library; it refers to the customers' perceptions of the competence and availability of the library staff (e.g., willingness to assist users); Information control (eight items): whether the library's collections are adequate to meet user needs and are organized in a way that allows self-sufficiency for library users (e.g., the website allows the user to locate information on their own, necessary collections for work and access from home or office); and Library as a place (five items): the

functionality and appropriateness of the library facilities for academic activities (e.g., a refuge for silence and solitude) (KUMAR; MAHAJN, 2019).

Table 1 LibQUAL dimensions and the original questions referring to each dimension

Dimension	Items
(1) Affect of Service (AS)	[AS-1] Employees who instill confidence in users [AS-2] Giving users individual attention [AS-3] Employees who are consistently courteous [AS-4] Readiness to respond to users' questions [AS-5] Employees who have the knowledge to answer user questions [AS-6] Employees who deal with users in a caring fashion [AS-7] Employees who understand the needs of their users [AS-8] Willingness to help users [AS-9] Dependability in handling users' service problems
(2) Information Control (IC)	[IC-1] Making electronic resources accessible from my home or office [IC-2] A library Web site enabling me to locate information on my own [IC-3] The printed library materials I need for my work [IC-4] The electronic information resources I need [IC-5] Modern equipment that lets me easily access needed information [IC-6] Easy-to-use access tools that allow me to find things on my own [IC-7] Making information easily accessible for independent use [IC-8] Print and/or electronic journal collections I require for my work
(3) Library as Place (LP)	[LP-1] Library space that inspires study and learning [LP-2] Quiet space for individual activities [LP-3] A comfortable and inviting location [LP-4] A getaway for study, learning or research [LP-5] Community space for group learning and group study

Source: Adapted from Rehman (2012), and Association of Research Libraries (ARL, 2020a).

The 22 items are questions presented on an interval scale of 1 to 9, which ask library users about their expectations and perceptions of the library. The questions ask for three scores, one for minimum quality, another for desired quality, and a last for perceived service quality. The ARL (2020a) calculates the "Service Superiority" by subtracting the desired score from the perceived score. Service superiority is an indicator of how far the service is exceeding its users' desired expectations.

Internationally, since the year 2000, over 1,300 libraries have sought to evaluate the quality of their offered services and for this, they applied the LibQual instrument, including among them college and university libraries, some through consortia, others as independent participants. By 2019, there had been 3,254 institutional surveys developed in 1,339 institutions in 35 countries, the instrument was translated into 19 languages and more than 2.9 million people participated in the surveys. The growing community of LibQual participants and its extensive dataset are valuable resources for improving library services (ARL, 2020a). In Brazil, studies and adaptations of the instrument are being carried out, but without the

direct use of the original instrument, since it is patented and entails a cost to be borne by the researcher.

In Brazil, there are some studies that have already proposed to evaluate the quality of library services, and some of them have already used original LibQual or adapted versions, such as Soares and Souza (2015), Furnival and Pinto (2016), Andrade (2017), Malheiro (2019) and Silva (2019).

Soares and Souza (2015) sought to identify and analyze the perception of employees and users of the Library and Information System at the Federal University of Ouro Preto, regarding the quality of the services provided by these libraries using an adaptation of the ServQual scale and the LibQual instrument, employing in their research a total of six dimensions.

Furnival and Pinto (2016) evaluated the quality of service in two public libraries and a community-school library in a city located in the interior of the state of São Paulo, and for this, they used 16 questions adapted from LibQual. In the article, the authors inform that the application of the instrument was carried out with a children and young audience, but they do not specify if the research was carried out with elementary and high school students, or what their age was.

Andrade (2017) used the Design Thinking approach as a principle of innovation of the services offered by the library, and for this, collected and analyzed the data raised in the library of the Nova Iguaçu campus, of CEFET/RJ, based on the LibQual instrument and the stages of the Design Thinking approach.

Two dissertations from 2019 were found on the LibQual theme. Among them, Silva (2019), who developed and applied their own model of library evaluation based on existing models (ServQual, ServPerf and LibQual), and Malheiro (2019) who evaluated the satisfaction of the users of the SISBI/UFPel Libraries using an adaptation of the LibQUAL instrument. One of the highlights obtained in the research by Malheiro (2019) on the items evaluated, showed that printed bibliography was one of the services that stood out most negatively in the descriptive questions.

Given this panorama of researches that used the LibQual instrument or adapted versions of the original, in Brazil, we then move on to identify the related researches that sought to analyze the relationships between the characteristics of the respondents and the different degrees of expectation and perception of quality of services in the section below.

Several studies have already been conducted in Brazil, investigating the relationships between individuals' characteristics and their expectations/perceptions of service quality using different measurement scales such as ServQual as in Antunes *et al*. (2020), Garcia *et al.* (2020), Smania *et al.* (2020), and the HEdPerf in Silva (2021).

In the study by Antunes *et al.* (2020), a study was conducted with students from Tourism, Hospitality, and Leisure courses at a public educational institution. They analyzed the relationships between the variables of individual characterization and the perceptions of the quality of the service offered, considering variables such as gender, type of high school attended, engagement in paid work, the reason for choosing the course, being a graduate of another course from the same institution, intention to take another course at the same institution, intention to work in the area of the course, and receipt of financial aid from the student permanence program of the institution. The authors found significant relationships between the ServQual scale items and the variables of age, not knowing or not wanting to take another course at the institution, and having the intention of starting a business in the area of the course that the student was taking.

Focusing on the staff of an educational institution, Garcia *et al.* (2020) researched users of the support service provided to the information system of a public educational institution. For this, they analyzed variables such as age, gender, position at the institution, length of service at the institution, education level, exercising a coordination function, and 'knowing' or 'being the articulator' of the support service to the information system at each campus. The authors identified statistically significant relationships of the ServQual items at different levels of quality perception with the variables of age, length of service, education level, and knowing or being the articulator of the support service at the campus.

Smania *et al.* (2020) applied the ServQual scale to students of an integrated technical high school course at a public educational institution and evaluated the variables of the course year in which they were, age, gender, previous student experiences, the intention to take the college entrance examination and to continue studies in the same areas of the course. The authors concluded that there are statistically significant relationships between the expectations in students who intended to take the entrance examination; these students had more expectations and better perceived the investigated aspects of the course than the respondents who did not intend or did not know if they would take the entrance exam. Other variables that showed statistically significant relationships with expectations and perceptions were students

being in the second, third, or fourth year of the course, always having studied at a public school, and intending to pursue a career in the area of the course.

In line with the designs of the ServQual scale, Silva (2021) used the HEdPerf scale to evaluate the quality of the services of the Navy Training Course at the Apprentice Navy School of Santa Catarina and evaluated variables such as age, education level, type of school where they attended high school, color or race, family income, motivation to enter the armed forces, and how they became aware of the course. Through the analysis, the author identified that the variables of family income, education level, and motivation to join the armed forces have a statistically significant relationship with certain items on the HEdPerf scale.

In this way, the variables present in the literature that may have relationships with specific aspects of service provision were identified and these variables were adopted in the present research, as shown in Table 2:

Table 2 Variables and sources

Variable	Source
Gender	Antunes *et al.* (2020), Garcia *et al.* (2020), Smania, Soares e Lima (2020)
Affiliation	Antunes *et al.* (2020), Garcia *et al.* (2020)
Type of educational institution prior to the course	Antunes *et al.* (2020), Smania, Soares e Lima (2020), Silva (2021)
Frequency of use of face-to-face services	Smania, Soares e Lima (2020)
Frequency of use of virtual services	Smania, Soares e Lima (2020)

The variable "Affiliation" deserves clarification regarding its adaptation for the present research: in the study by Antunes *et al.* (2020), the authors categorized the respondents according to the nature of the course, as they hypothesized that students from different courses had different expectations and perceptions about the service. In the study by Garcia *et al.* (2020), the authors categorized the respondents between faculty and administrative staff for the same reason. In the present research, respondents were categorized as students or staff.

The variable "Frequency of Service Use" also deserves a detailed explanation regarding its adaptation in relation to the literature: in the study by Smania *et al.* (2020), the authors categorized the students between first, second, third, and fourth-year students, as they hypothesized that student expectations and perceptions varied according to the degree of exposure to the course, i.e., in relation to the course duration. In the present research, respondents were categorized according to the frequency of use of library services, either in face-to-face or virtually, for the same reason, i.e., that the expectation and perception would

differ among users according to their degree of service use, represented then by the frequency of use.

Thus, these were the respondent characterization variables that were collected in the questionnaires to make the analyses in relation to the expectation and perception variables of the library users.

3 METHODS

The approach of this research is considered quantitative. From the point of view of its objectives, it is characterized as descriptive. Regarding the technical procedures, it is a survey. For data collection, the LibQual instrument translated into Portuguese and adapted based on the models from the ARL (2020a), Brito (2013), Fitzsimmons, J. and Fitzsimmons, M. (2022), Parasuraman, Zeithaml e Berry (1988), and Garcia (2019) was used.

The questionnaire, in portuguese, is presented in Table 3. The questionnaire measured the library users' expectations regarding the services and also their perceptions of the performance of the services provided. In relation to the time horizon of the study, the research was considered cross-sectional, with data collected from August 24 to September 19, 2022.

Table 3 LibQual instrument questions adapted for the questionnaire

Expectation	Perception
[AS-1] 1a - Funcionários de uma biblioteca de excelência inspiram confiança nos usuários	[AS-1] 1b - Na sua opinião os funcionários da biblioteca do IFSC inspiram confiança
[AS-2] 2a - Os funcionários de uma biblioteca de excelência dão atenção individualizada aos usuários	[AS-2] 2b - Os funcionários da biblioteca do IFSC dão atenção individualizada aos usuários
[AS-3] 3a - Os funcionários das bibliotecas excelentes são corteses/simpáticos	[AS-3] 3b - Os funcionários da biblioteca do IFSC são corteses/simpáticos
[AS-4] 4a - Numa biblioteca de excelência há prontidão para responder às perguntas dos usuários	[AS-4] 4b - Há prontidão para responder às perguntas dos usuários da biblioteca do IFSC
[AS-5] 5a - Funcionários de excelência tem conhecimento para responder às perguntas dos usuários	[AS-5] 5b - Os funcionários da biblioteca do IFSC têm conhecimento para responder às perguntas dos usuários
[AS-6] 6a - Funcionários excelentes lidam com os usuários de maneira atenciosa	[AS-6] 6b - Os funcionários da biblioteca do IFSC lidam com os usuários de maneira atenciosa
[AS-7] 7a - Funcionários excelentes entendem as necessidades dos usuários da biblioteca	[AS-7] 7b - Os funcionários da biblioteca do IFSC entendem as necessidades dos usuários da biblioteca
[AS-8] 8a - Funcionários excelentes tem vontade para ajudar os usuários	[AS-8] 8b - Os funcionários da biblioteca do IFSC têm vontade de ajudar os usuários
[AS-9] 9a - Funcionários excelentes transmitem confiança ao lidar com problemas no atendimento dos usuários	[AS-9] 9b - Os funcionários da biblioteca do IFSC transmitem confiança ao lidar com problemas no atendimento dos usuários
[IC-1] 10a - Uma biblioteca excelente disponibiliza aos usuários recursos eletrônicos acessíveis (e-books, bases de dados, etc.) de casa ou escritório	[IC-1] 10b - A biblioteca do IFSC disponibiliza aos usuários recursos eletrônicos acessíveis (e-books, bases de dados, etc.) de casa ou escritório
[IC-2] 11a - O site de uma biblioteca excelente permite aos usuários localizarem informações por conta	[IC-2] 11b - O site da biblioteca do IFSC me permite localizar informações por conta própria

Expectation	Perception
própria	
[IC-3] 12a - Uma biblioteca excelente tem livros e outros materiais impressos dos quais os usuários precisam para seus estudos/pesquisas	[IC-3] 12b - A biblioteca do IFSC tem livros e outros materiais impressos de que preciso para meus estudos/pesquisas
[IC-4] 13a - Uma biblioteca excelente tem recursos eletrônicos de informação (e-books, bases de dados, etc.) que os usuários precisam	[IC-4] 13b - A biblioteca do IFSC tem os recursos eletrônicos de informação (e-books, bases de dados, etc.) que eu preciso
[IC-5] 14a - Uma biblioteca excelente tem equipamentos modernos que me permitem acessar facilmente as informações necessárias	[IC-5] 14b - A biblioteca do IFSC tem equipamentos modernos que me permitem acessar facilmente as informações necessárias
[IC-7] 15a - Uma biblioteca de excelência permite que os usuários encontrem as informações facilmente por conta própria	[IC-7] 15b - A biblioteca do IFSC permite que os usuários encontrem as informações facilmente por conta própria
[IC-8] 16a - Uma biblioteca excelente possui coleções de periódicos impressos e / ou eletrônicos que os usuários necessitam	[IC-8] 16b - A biblioteca do IFSC possui coleções de periódicos impressos e / ou eletrônicos de que eu necessito
[LP-1] 17a - O espaço de uma biblioteca excelente inspira estudo e aprendizado	[LP-1] 17b - O espaço da biblioteca do IFSC inspira estudo e aprendizado
[LP-2] 18a - Uma biblioteca excelente possui espaço silencioso para atividades individuais	[LP-2] 18b - A biblioteca do IFSC possui espaço silencioso para atividades individuais
[LP-3] 19a - Uma biblioteca excelente possui um local confortável e convidativo	[LP-3] 19b - A biblioteca do IFSC possui um local confortável e convidativo
[LP-4] 20a - Uma biblioteca excelente é um refúgio para estudar, aprender ou pesquisar	[LP-4] 20b - A biblioteca do IFSC é um refúgio para estudar, aprender ou pesquisar
[LP-5] 21a - Uma biblioteca de excelência é um espaço comunitário para aprendizagem e estudo em grupo	[LP-5] 21b - A biblioteca do IFSC é um espaço comunitário para aprendizagem e estudo em grupo

Source: Adapted from ARL (2020a), Brito (2013), Fitzsimmons, J. e Fitzsimmons, M. (2022), Parasuraman, Zeithaml e Berry (1988) and Garcia (2019).

The research population consists of students and staff (administrative staff and faculty) of IFSC who are over 18 years old. The number of students enrolled in the institution was 47,050 and the number of employees of the institution was 2,788. This number includes students under 18 years old.

To send the LibQual questionnaire to the research participants, the Sophia software was used to send batch emails to both student and staff profiles. In practical terms, after sending the questionnaires electronically via email to all members of the research population, the individuals who voluntarily responded to the questionnaire constituted the study sample.

The questionnaire used in this research was divided into two parts. The first part contained information regarding the respondents' profiles, including the variables identified in the literature and detailed in section 2. The second part consisted of the questions from the adapted LibQual instrument, as described in Table 3. The questionnaire was pre-tested with six individuals, including four students and two staff members (faculty and administrative staff in education).

The pre-test indicated a need to reevaluate the item "[IC-6] Easy-to-use access tools that allow me to find things on my own," as it resembled the item "[IC-7] Making information easily accessible for independent use." After analyzing the feedback, the researchers decided to remove item IC-6 due to its similarity to IC-7. Additionally, minor changes to the questionnaire presentation suggested during the pre-test were incorporated, resulting in the final version presented in Table 3.

For respondents to express their expectations and perceptions regarding each item in the questionnaire, a 9-point interval scale was used. Respondents were instructed that a score of 1 represented "Strongly Disagree," while a score of 9 represented "Strongly Agree." An "N/A" (Not Applicable) option was also provided to prevent respondents from being forced to express their opinion on items they did not want to, could not, or did not have knowledge of.

To conduct the research, project approval was sought from the Ethics Committee. The project was submitted to the Plataforma Brasil, which forwarded it to the Ethics Committee. On August 11, 2022, the project received approval under opinion number 5.575.682 and a Certificate of Ethical Appreciation Presentation (CEAP) with the number 60150522.3.0000.5369.

Initially, 546 questionnaires were collected, including incomplete or invalid responses. The initial data cleaning process followed two screening criteria from the LibQual data screening guidelines (ARL, 2020a, 2020b): 1. Records with incomplete data; 2. Any record containing non-applicable (N/A) responses. For a more accurate evaluation, two additional data cleaning criteria were applied: 3. Records with data from users who did not use library services face-to-face or virtually; 4. Records with responses from a student on the staff questionnaire. After data cleaning, 328 responses remained in the final dataset.

The sample of this research consists of users from all 23 libraries of the Integrated Library System of IFSC, including 194 students and 134 staff members who utilize the libraries. Following data cleaning, the only population profile that did not remain in the sample was "Master's student" because there were no questionnaires from students in this course. Data analysis was conducted using Excel and the Statistical Package for the Social Sciences (SPSS).

The reliability of the instrument was measured using Cronbach's Alpha, and the results indicate that all three dimensions (Service Affect, Information Control, Library as Place) in terms of both expectation and perception showed adequate indicators (Alpha greater than 0.8).

The normality of the distribution of responses was also tested using the Kolmogorov-Smirnov and Shapiro-Wilk tests and was rejected for all variables and respondent groups at a significance level of 5%.

The characterization variables for the respondents were five, namely: Gender (Male or Female), Affiliation (Student or Staff), Educational Background (Always in a public institution, Predominantly in a public institution, Half in a public institution and half in a private institution, Predominantly in a private institution, and Always in a private institution), and Frequency of using the library's services in-person and virtually (Daily, Weekly, Monthly, Annually, and I have been there, but less than annually).

4 RESULTS AND DISCUSSION

The analysis of the results involved 5 qualitative characterization variables of the respondents: Gender, Affiliation, Educational Background, and Frequency of Use of the Library Services Face-to-face and Virtually. Table 4 presents the absolute and relative frequency regarding the gender of the respondents, highlighting the predominance of women who responded to the survey. Of the 328 questionnaires analyzed, 174 (53%) were answered by women, and 154 (47%) were answered by men.

A Mann-Whitney U test analysis was conducted to determine if there were differences between the responses of female and male individuals. With 95% confidence, it was found that there was a difference in 17 items related to the respondents' expectations. In the Service Affect dimension, there was a difference in five items (AS_1, AS_4, AS_6, AS_8, AS_9). In the Information Control dimension and the Library as Place dimension, there was a difference in all items.

The same test was applied to identify differences in perception between the respondents of the two genders. The results indicated that in the Service Affect dimension, there was a difference in six items (AS_3, AS_5, AS_6, AS_7, AS_8, AS_9). In the Information Control dimension, there was a difference in only one item (IC_7). In the Library as Place dimension, there was a difference in all items, as was the case in relation to expectation.

Lastly, the same test was performed to check if there was a difference between the gaps pointed out by the respondents of the two genders. The results, contrary to the previous

tests, showed no difference in gaps between the two groups of respondents, with 95% confidence.

Table 4 Mann-Whitney U test with gender

Item	Expectation		Perception		Gap	
	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)
AS_1	11086	0.000*	11984	0.073	12571	0.274
AS_2	12387	0.162	12061	0.100	13283	0.880
AS_3	12584	0.208	11840	0.047*	12963	0.564
AS_4	12060	0.037*	12064	0.092	13338	0.937
AS_5	12689	0.290	11372	0.011*	12457	0.219
AS_6	12153	0.028*	11809	0.037*	13112	0.698
AS_7	12139	0.055	11123	0.005*	12790	0.418
AS_8	11750	0.007*	11238	0.006*	13055	0.652
AS_9	11253	0.001*	11061	0.004*	13319	0.918
IC_1	11878	0.010*	12035	0.087	13145	0.743
IC_2	12014	0.012*	12625	0.337	12917	0.540
IC_3	12140	0.028*	12649	0.359	13243	0.845
IC_4	11340	0.001*	12484	0.268	12582	0.316
IC_5	11764	0.008*	12038	0.102	13183	0.794
IC_7	12080	0.026*	11331	0.012*	12926	0.554
IC_8	11977	0.030*	12664	0.380	12884	0.532
LP_1	11706	0.003*	10914	0.002*	12528	0.271
LP_2	12124	0.019*	11620	0.026*	12399	0.202
LP_3	11731	0.002*	11577	0.025*	12601	0.319
LP_4	11305	0.000*	10885	0.002*	12825	0.463
LP_5	10053	0.000*	11459	0.017*	12995	0.603

*p < .05

The literature on differences in expectations and perceptions about the quality of services points to distinct results. The findings of this research suggest that there are differences in expectations based on the respondent's gender in 17 items. This result converges with the studies of Malheiro (2019) and Garcia *et al.* (2020), which also found differences in expectation between respondents of the two genders. On the other hand, the results of this research diverge from the findings of Smania *et al.* (2020) and Antunes *et al.* (2020), who found no difference in expectation between the two genders.

Regarding perception, this research found a difference between the two gender in 12 items. These findings agree with the results of Malheiro (2019) and Antunes *et al.* (2020) and disagree with the results of Silva (2019), Smania *et al.* (2020), and Garcia *et al.* (2020).

Next, the results of the Mann-Whitney U test are presented, aiming to determine if there are differences between the responses of the student groups (194) and staff (134). It was found that there is a difference in six items relating to the respondents' expectations. Three of

them are from the Service Affect dimension (AS_2, AS_5, AS_8), two from the Information Control dimension (IC_2, IC_7), and just one from the Library as Place dimension (LP_1).

In terms of the quality of service perception observed by the respondents, there was a difference in 14 items. However, the differences were more frequent in the Information Control (difference in all items except IC_7) and Library as Place (difference in all items) dimensions. The Service Affect dimension had the fewest different items, with differences only in items (AS_1, AS_6, AS_7).

Table 5 shows the tests performed regarding the difference in Gaps depending on the respondent's affiliation, and there were differences in all items, with the exception of item AS_4, from the Service Affect dimension. All the results of the U tests reported have 95% confidence.

Table 5 Mann-Whitney U test with affiliation (students or staff)

Item	Expectation		Perception		Gap	
	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)
AS_1	12028	0.126	11291	0.028*	10550	0.001*
AS_2	11469	0.032*	11735	0.114	10961	0.007*
AS_3	11790	0.058	11834	0.133	10878	0.004*
AS_4	12070	0.143	12355	0.409	11831	0.118
AS_5	11258	0.008*	12145	0.278	10646	0.002*
AS_6	12349	0.244	11377	0.031*	10963	0.005*
AS_7	12277	0.265	10939	0.009*	10303	0.000*
AS_8	11642	0.025*	11476	0.051	10564	0.001*
AS_9	12120	0.164	11777	0.123	11213	0.018*
IC_1	12399	0.301	11166	0.020*	10796	0.004*
IC_2	11785	0.026*	11158	0.020*	10220	0.000*
IC_3	12828	0.763	10720	0.005*	10522	0.002*
IC_4	11822	0.051	10866	0.009*	9659	0.000*
IC_5	12315	0.260	10349	0.001*	9980	0.000*
IC_7	11551	0.013*	11572	0.077	10049	0.000*
IC_8	12280	0.266	10290	0.001*	9584	0.000*
LP_1	11829	0.037*	9933	0.000*	8848	0.000*
LP_2	12114	0.099	9570	0.000*	8912	0.000*
LP_3	12508	0.356	10188	0.000*	9720	0.000*
LP_4	12216	0.125	10286	0.001*	9546	0.000*
LP_5	12026	0.131	9639	0.000*	8538	0.000*

*$p < .05$

The literature on differences in expectations and perceptions about the quality of services points to varied results. The findings of the current study reveal differences in expectations according to the profiles of students and staff in 6 items. This result diverges from the findings of Jankowska, Hertel and Young (2006) who found no difference in expectations be-tween respondents with different affiliations. Regarding perception, this

research found a difference between students and staff in 14 items. These findings converge with the results of Jankowska, Hertel and Young (2006).

Similarly to the U-tests conducted to identify differences between Gender and Affiliation of respondents, tests were also conducted to identify differences between Educational Background and Frequency of use of library services both face-to-face and Virtually. However, due to the presence of more than two categories in each variable, the Kruskal-Wallis test was chosen (FÁVERO; BELFIORE, 2019).

Concerning the respondent profile by educational background, 163 (49.7%) of the respondents reported always having studied at a public institution, 83 (25.3%) predominantly studied at a public institution, 48 (14.6%) respondents split their education equally between public and private institutions, 28 (8.5%) predominantly studied at a private institution and 2% of respondents reported always having studied at a private education institution.

Upon conducting Kruskal-Wallis tests with the categories of the variable nature of the previous educational institution, labeled in the research as "Always at a public institution", "Predominantly at a public institution", "Half at a public institution and half at a private institution", "Predominantly at a private institution" and "Always at a private institution", tests were conducted concerning the difference in expectation, based on the profiles of the educational background variable, and there was a difference in only two questionnaire items (AS_6, IC_8). Regarding the perception of service quality, there was a difference in three items (AS_1, IC_4, LP_5), each from a different dimension. Regarding the gap results, in five items there was a difference in what was perceived by respondents from different educational backgrounds (AS_3, AS_7, IC_4, LP_1, LP_5), and these items refer to different dimensions without any concentration.

Table 6 Kruskal-Wallis test with the Variable type of previous educational institution (public or private)

Item	Expectation		Perception		Gap	
	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.
AS_1	4.605	0.330	13.023	0.011*	6.658	0.155
AS_2	3.752	0.441	8.338	0.080	7.385	0.117
AS_3	1.056	0.901	8.772	0.067	10.311	0.035*
AS_4	6.138	0.189	6.388	0.172	7.299	0.121
AS_5	6.339	0.175	6.064	0.194	6.545	0.162
AS_6	10.094	0.039*	9.434	0.051	8.868	0.064
AS_7	5.883	0.208	6.546	0.162	11.188	0.025*
AS_8	6.390	0.172	4.130	0.389	3.693	0.449
AS_9	3.094	0.542	4.492	0.343	4.365	0.359
IC_1	5.295	0.258	2.601	0.627	5.527	0.237

Item	Expectation		Perception		Gap	
	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.
IC_2	4.906	0.297	5.221	0.265	4.525	0.340
IC_3	6.397	0.171	8.605	0.072	9.415	0.052
IC_4	7.033	0.134	12.432	0.014*	11.620	0.020*
IC_5	9.050	0.060	5.993	0.200	7.403	0.116
IC_7	9.501	0.050	5.984	0.200	8.049	0.090
IC_8	10.415	0.034*	6.295	0.178	6.372	0.173
LP_1	5.799	0.215	8.696	0.069	9.780	0.044*
LP_2	0.819	0.936	6.277	0.179	4.540	0.338
LP_3	2.884	0.577	4.018	0.404	5.033	0.284
LP_4	4.906	0.297	9.242	0.055	7.977	0.092
LP_5	2.383	0.666	14.599	0.006*	11.087	0.026*

*$p < .05$

Regarding the results of the current study, there was a difference in expectations in relation to previous educational institutions in 2 items. This result is in agreement with the studies by Antunes *et al.* (2020) and Smania *et al.* (2020), which also found differences in expectations among different profiles of educational backgrounds in previous institutions.

As for perception, this research found differences among respondent profiles based on their prior educational institutions in 3 items. These findings also align with Antunes *et al.* (2020) and Smania *et al.* (2020), who similarly found differences in perception among profiles of educational backgrounds in previous institutions.

The frequency of use of library services from SIBI/IFSC, whether in-person or virtually, are described in Table 7 and 8.

Table 7 Absolute and relative frequency of use of face-to-face services

Frequency	n	%
Monthly	102	31
Weekly	91	28
Annually	51	16
I've been, but less than annually	44	13
Daily	40	12
Total	328	100

Table 8 Absolute and relative frequency of use of virtual services

Frequency	n	%
Monthly	111	34
Weekly	74	23
Annually	58	18
I've been, but less than annually	58	18
Daily	27	8
Total	328	100

The Kruskal-Wallis test was used to test the differences in medians among the categories of usage frequency of the SIBI/IFSC library services, both face-to-face and virtually. The results of the KW tests for each of the forms of access to the services are presented in Table 9 and 10. The categories analyzed for each of the two types of frequency were: "Daily," "Weekly," "Monthly," "Annually," and "Have used, but less than annually." There were no differences in expectations of users who used the services with more or less frequency, both in the in-person format and in virtual access.

Table 9 Kruskal-Wallis test with the face-to-face services use frequency variable

Item	Expectation		Perception		Gap	
	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.
AS_1	3.631	0.458	10.131	0.038*	6.036	0.197
AS_2	0.4	0.982	4.038	0.401	2.191	0.701
AS_3	0.833	0.934	7.337	0.119	6.556	0.161
AS_4	8.54	0.074	4.659	0.324	1.517	0.824
AS_5	2.635	0.621	1.507	0.825	1.962	0.743
AS_6	1.194	0.879	5.733	0.22	3.119	0.538
AS_7	1.744	0.783	2.651	0.618	5.818	0.213
AS_8	2.487	0.647	9.048	0.06	5.033	0.284
AS_9	1.444	0.837	3.325	0.505	0.984	0.912
IC_1	2.714	0.607	13.287	0.010*	8.858	0.065
IC_2	2.091	0.719	13.239	0.010*	11.732	0.019*
IC_3	1.131	0.889	5.923	0.205	5.682	0.224
IC_4	2.534	0.639	11.985	0.017*	12.774	0.012*
IC_5	4.682	0.322	11.372	0.023*	10.197	0.037*
IC_7	6.983	0.137	8.085	0.089	15.446	0.004*
IC_8	4.459	0.347	5.72	0.221	4.232	0.376
LP_1	1.838	0.766	8.051	0.09	7.077	0.132
LP_2	2.986	0.56	3.993	0.407	5.545	0.236
LP_3	0.658	0.956	2.445	0.654	2.858	0.582
LP_4	0.132	0.998	6.801	0.147	6.435	0.169
LP_5	1.81	0.771	8.12	0.087	7.738	0.102

*p < .05

Table 10 Kruskal-Wallis test with the virtual services use frequency variable

Item	Expectation		Perception		Gap	
	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.
AS_1	3.128	0.537	12.602	0.013*	7.694	0.103
AS_2	0.729	0.948	7.737	0.102	4.096	0.393
AS_3	1.067	0.899	5.618	0.23	5.082	0.279
AS_4	5.616	0.23	9.853	0.043*	4.036	0.401
AS_5	0.921	0.921	5.079	0.279	3.668	0.453
AS_6	4.602	0.331	5.264	0.261	5.492	0.24
AS_7	2.479	0.648	4.954	0.292	10.401	0.034*
AS_8	2.866	0.581	2.834	0.586	3.808	0.433
AS_9	1.472	0.832	4.29	0.368	3.189	0.527
IC_1	1.364	0.85	16.477	0.002*	14.882	0.005*
IC_2	2.781	0.595	13.915	0.008*	12.103	0.017*
IC_3	3.724	0.445	8.132	0.087	13.402	0.009*
IC_4	2.199	0.699	18.646	0.001*	20.242	0.000*

Item	Expectation		Perception		Gap	
	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.	Chi-Square	Asymp. Sig.
IC_5	1.483	0.83	5.328	0.255	8.987	0.061
IC_7	4.376	0.357	3.692	0.449	9.449	0.051
IC_8	2.192	0.701	7.222	0.125	7.805	0.099
LP_1	1.149	0.886	5.123	0.275	4.519	0.34
LP_2	4.942	0.293	1.536	0.82	5.048	0.282
LP_3	1.93	0.749	3.701	0.448	1.659	0.798
LP_4	1.01	0.908	2.11	0.716	2.363	0.669
LP_5	2.962	0.564	5.617	0.23	5.774	0.217

*p < .05

The Kruskal-Wallis test was applied to the perception medians of users who use the library services with different frequencies. Regarding the perception of the quality of service with in-person frequency, there was a difference in five items (AS_1, IC_1, IC_2, IC_4, IC_5); for services offered virtually, there was a difference in the same number of items (AS_1, AS_4 IC_1, IC_2, IC_4). It is noted that there is a greater concentration of items with different results in the Information Control dimension, both for in-person and virtual frequency.

Referring to the gaps of the in-person frequency profiles, the result was four items with different medians, all belonging to the Information Control dimension (IC_2, IC_4, IC_5, IC_7). In the frequencies of use of virtual services, there were five items with different medians (AS_7, IC_1, IC_2, IC_3, IC_4), one item from the Service Affect dimension and the majority of items from the Information Control dimension.

The results of this research point out that there is no difference in expectations according to the frequency of access to services in either in-person or virtual format. Despite the frequency of use of the services being widely cited in the literature for evaluating the quality of library services (INTERNATIONAL STANDARDIZATION, 2014; POLL; TE BOEKHORST, 2017), no literature was found on the results of expectations nor on the gaps in quality according to user profiles by their frequency of use of library services.

Regarding perception, this research found a difference between the types of in-person frequency in five items. These findings disagree with the results of Khaola and Mabilikoane's research (2015), which pointed out that the in-person frequency of use of the library was not related to the perception of service quality in any of its dimensions.

Regarding the perception of the types of virtual service frequency, a difference was also found in five items. These findings agree with the results of the research by Khaola and

Mabilikoane (2015), which pointed out that the virtual frequency of library use was related to the perception of service quality in the Service Affect and Information Control dimensions.

Initially, five qualitative variables characterizing respondents were proposed to be investigated if they had a relationship with different levels of expectation and satisfaction. The Gender variable showed a difference with 17 items of Expectation, 12 items of Perception, and no Gap. The Link variable showed a difference with 6 items of Expectation, 14 items of Perception, and 20 Gaps, showing a pattern opposite to the Gender variable. The variable Type of previous educational institution showed a difference in 2 items of Expectation, 3 items in Perception, and 5 items in the gap.

Finally, the variables Frequency of use of library services face-to-face or virtually, there was no difference in user expectations and there was a difference in 5 items of perception. The in-person frequency variable showed a difference in 4 items in the gap and the variable frequencies of use of virtual services showed a difference in five items in the gap. The in-person frequency and virtual frequency variables showed approximate patterns presenting differences even in the same items.

5 CONCLUSION

The aim of this research was to identify whether expectations and perceptions of the quality of the libraries' service at the Federal Institute of Education, Science and Technology of Santa Catarina (IFSC), based on the LibQual instrument, vary according to types of users.

Using the Mann-Whitney U Test with the variables: gender (female and male) and affiliation (students or staff) and through the Kruskal-Wallis Test with the variables: previous educational institution, frequency of use of face-to-face and virtual services, it was possible to identify some variables in which there is a difference between the expectations, perceptions, and gaps of certain items of the LibQual instrument.

Concerning respondents' expectations, the variables where there were statistically significant differences were gender, affiliation, and previous educational institution. The variables frequency of use of face-to-face and virtual services did not show a statistically significant difference. In relation to the respondents' perception of the services, the variables that were statistically significant were gender, affiliation, previous educational institution, and frequency of use of library services in-person or virtually. That is, with regard to perception, all variables were statistically significant. About the gaps, the variables that showed

statistically significant differences were affiliation, previous educational institution, and frequency of use of library services in-person or virtually. Only the gender variable did not show a difference in the gap results.

Thus, in identifying the relationships between user characteristics and the expectations and perceptions of the quality of the service offered by SIBI/IFSC, it was found that the characteristics of the respondents are more related to perceived quality than to user expectations. For future suggestions, it is proposed to investigate differences in expectations and perceptions of quality among different campuses and courses.

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