

Perceived Quality of Information System Support Service of an Education Institution and Its Relationship with the Users' Characteristics

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Abstract

Technological resources as a tool used to generate information and optimise processes are increasingly present in organisations. Among these resources are the information systems, which are used to generate competitive advantage. However, for these resources to represent an effective competitive advantage in the organisation, it is necessary to have support which should be evaluated. Therefore, the study sought to assess the quality of support service provided to the information system for academic management at an education institution according to docents' and administrative technician's perception. The Servqual scale was used for such assessment with adaptations made considering the application. As for the form of approach, this is a quantitative study in which data collection was performed by using electronic questionnaire and the sample was of convenience with 194 respondents. Data analysis was performed by using descriptive statistics, normality test, median difference test and regression analysis. As a result, the study revealed that the respondents' perception on the quality is higher with the dimension "security", whereas the dimension "responsiveness" had the largest gap. Regression analysis allowed identifying that variables "gender" and "age" have a statistically significant influence on certain Servqual items. According to the respondents' perception, there is a gap in the service quality regarding items and dimensions addressed in the study.

Keywords: Servqual, service quality, information technology, support service

1. Introduction

After you have introduced the problem and have developed the background material, explain your approach to solving the problem. In empirical studies, this usually involves stating your hypotheses or specific question and describing how these were derived from theory or are logically connected to previous data and argumentation. Develop the rationale for each. Also, if you have some hypotheses or questions that are central to your purpose and others that are secondary or exploratory, state this prioritization. Explain how the research design permits the inferences needed to examine the hypothesis or provide estimates in answer to the question.

O'Brien and Marakas (2012) highlight the information systems (IS) as an organised combination of people, hardware, software, communication network, data resources, including policies and procedures for storing, restoring, transforming and disseminating information within an organisation. Laudon and Laudon (2021) complement that information systems are one of the main information technology (IT) tools the managers have to achieve high levels of effectiveness and productivity in operations.

Following this tendency, organisations use information systems as a tool to assist in the management of information, and this is not different in education institutions, as they need information systems to do so (Duarte et al., 2015). Senger and Brito (2005) show that education institutions need to use IT resources, including ISs,

which is the result of the great amount of information to be accessed, collected, filtered, processed and analysed by the managers. Vidigal and Barros (2015) point out that the demand for information in academic management positions such as course coordinators, managers, secretaries and other users is latent. In this context, information systems are considered a tool supporting academic management.

In turn, Freitas et al. (2006) consider that the human element be aligned with the components of technological recourses so that they can be effective for the organisation. Magalhães and Pinheiro (2007) highlight that IS-related services enabling the organisation to better use of these instruments. These services are called information technology (IT). The authors point out, for example, that the support service provided to ISs is a very important IT service which is essential for their good functioning (Magalhães & Pinheiro, 2007). Albernaz and Freitas (2010) complement this by stating that the support service provided to an IS is aimed at not only solving technical problems of IT but also at giving specific guidance to users about the system's functionalities, including training and qualification to use the system.

Considering the importance of ISs for an organisation, one can perceive that it is necessary to measure their performance as well as that of the support service provided to these systems to verify whether they are managing to meet the organisation's demands. A way to measure the quality of IT service is to use the perception of users on it (Souza, 2017). Magalhães and Pinheiro (2007) reinforce this idea by stating that the quality of a service or product is related to what the customer expects from it, that is, the perception of customers on a given product or service is related to their expectations.

In this sense, Souza (2017) states that it is possible to extract the difference between expectation and perception on quality by using the Servqual scale, developed by Parasuraman et al. (1985), to measure the quality perceived by the customer. The study by Luz (2014) points out that Servqual is a long-lasting and popular model for assessment of service quality.

Among the previous studies using the Servqual scale for assessment of IT services, the following is highlighted: Iwasa and Tavares (2017); Freitas et al. (2006); Kang and Bradley (2002). However, as for the studies using the Servqual scale in the context of education institutions, one can perceive a smaller number, as the cases of Castro (2015) and Luz (2014). It should be also emphasised that although the studies by Luz (2014) and Castro (2015) have been based on the Servqual scale, the researchers did not consider the respondents' expectancies in their studies.

The study object of the present work is the Federal Institute of Santa Catarina (FISC), a Brazilian public education institution. FISC has been offering professional, scientific and technological education for more than 100 years, including courses in several levels.

Nowadays, FISC uses the Integrated System for Academic Activity Management (SIGAA) for management of its academic processes, an information system which is used by servers and students.

Considering the above-mentioned, as well as the absence of a formal evaluation of support services for the system's users, one can perceive the need to measure the performance of the support service provided to the system to verify whether it is fulfilling the users' demands. In this way, the present study seeks to answer the following questions: What is the users' perception on the support service provided to the information system for the FISC academic management? The objective of the study is, therefore, to assess the support service provided to the academic information system of the Federal Institute of Santa Catarina, according to its users' perception, and examine the differences in the quality perceived on the service by faculty members and education administrative technicians (EATs).

2. Literature Review

The process of academic management evolves with the emergence of new technologies. For many years, the academic managers of education institution were only concerned with curriculum organisation, qualification of faculty and routine follow-up of activities. In this way, for example, academic managers accounting for planning and administrative organisation were less involved (Sousa, 2011).

Lavor et al. (2015) highlight that management in education institutions has peculiarities inherent to the teaching context, meaning that no comparison is adequate with parameters and criteria of industry, commerce or services. Such differentiation occurs by the fact that academic managers have no degree in administration as they are mostly faculty members or technical workers linked to completely different areas of academic training rather than management.

In this way, one can highlight information systems for academic management or systems of academic information, which are information systems aimed at managing academic activities. These systems allow

controlling information within institutions and consolidating relevant ones, which facilitates the execution of academic processes (Souza & Monteiro, 2015). Duarte et al. (2015) state that information systems for academic management provide control of cadastral data on students, faculty members and courses as well as access to information on disciplines, classes, enrolment, grades, academic record and several other functions assisting in the management of an education institution. The same authors still highlight that such systems allow students to have a great interaction with the institution or academic processes as they offer the possibility of access to Internet.

According to Berdik et al. (2021) information systems are a cohesive organization of tools, hardware, software, and people to work together and collectively process and redistribute information to appropriate parties. As stated by Serrano et al. (2021) IT services can be defined as a group of “tasks” provided by an IT system or an IT department, that is, IT service can be characterized as the application of specialized capacities on IT assets. As mentioned by Lee et al. (2019) IT support refers to how well IT assists in collaborative work, communications, and searching, accessing, and storing information.

For Duarte et al. (2015), it is very important to evaluate the effectiveness of the systems of academic information continuously, including any management control tool, for good progress of the activities. The same authors also added that this issue (i.e. evaluation of information systems) has been recently studied in depth.

Albernaz and Freitas (2010) point out that the IT support service is essential for an organisation to improve its efficacy and competitiveness. Additionally, Magalhães and Pinheiro (2007) state that efficiency, effectiveness and economics of the support system provided to users of IT resources are critical factors for successfully meeting strategic objectives outlined by the organisation.

IT support service is usually responsible for providing support to users of IT services. Magalhães and Pinheiro (2007, p. 107) state that this type of service is “responsible for the first impression that the IT area will provide to its users when interaction becomes necessary”. In this way, one should understand that the team providing IT support also accounts for the interaction with users of technological resources when they perceive and report some error.

Albernaz and Freitas (2010) add that when one talks about IT support services one is speaking of a broader sense, which can vary depending on the context in which they are inserted. For example, in certain organisations, the IT support service can become restrict to the provision of support and equipment such as maintenance of computers or cables. As for other contexts, support service can be provided in the form of guidance on the use of resources, such as training for use of information systems.

Assessing a software-based information system is not an easy task. A series of difficulties is presented given the set of variables (indicators) which should be taken into consideration to characterise the value of a system (Gonzales et al., 2016). Duarte et al. (2015) consider the establishment of criteria and parameters for assessment of systems to be a complex task, especially because there is yet no consensus regarding what can be considered a success in terms of IS. Luz (2014) points out that there are different types of approaches for assessing ISs in terms of success, quality and performance. Nevertheless, still according to Luz (2014), metrics, measures and models of measurement are not clearly defined for assessing the quality of IT services.

Souza (2017) agrees that the assessment of ISs and related services is of great relevance for good organisational performance, but creating or choosing a means of assessing ISs and their services remains difficult due to the reasons listed in the studies by Luz (2014), Gonzales et al. (2016) and Duarte et al. (2015).

Albernaz and Freitas (2010) add that due to the peculiarities of IT services, there are difficulties in finding methods to assess them, which shows the gap in the assessment of these services. Luz (2014), in turn, states that IT managers are well accepting models from other areas for assessment of IT services, such as the Servqual and ServPerf models, which are aimed at measuring the quality of a service. In this context, these models measure the quality of the service provided by IS or IT services.

Gacenga et al. (2011) emphasise that the assessment of quality using models has become more used by several organisations because equilibrium could be maintained between qualitative, quantitative, internal and external measures. Given this, Luz (2014) points to studies using models such as the Servqual scale for assessment of ISs. By applying these types of model, one seeks to assess the quality of services provided based on the users’ perspective.

2.1 Service Quality

Zeithaml et al. (2014) state that the quality perceived by users of services relies on the difference between expected quality and experienced quality. For the authors, service quality is currently viewed as a central issue

because all the organisations somehow compete to each other on the services provided.

Wirtz and Lovelock (2021) state that it is common to find in the literature studies on the quality of tangible goods, that is, those with an industrial perspective. However, the same is not applied to studies on service quality.

Considering this theme, in 1988 Zeithaml, Parasuraman & Berry created a conceptual model of service quality and a methodology to measure the customers' perceptions on the quality of services. However, because the model had gaps which needed to be filled to offer a quality service, they called it a model of gaps. Later, based on the model of gaps, the same authors developed another model, also called scale, aimed at effectively measuring the users' perception on the quality service (Zeithaml et al. 2014). Hoffman and Bateson (2016) complement by emphasising that the model created, the so-called Servqual, is frequently used for measurement of service quality.

In this sense, Shekarchizadeh et al. (2011) argue that the Servqual scale is more adequate for assessment of the service quality in contexts where users can have different expectations about the same service as both perception and expectation are of concern. In this way, the authors consider that the Servqual scale provides a more reliable assessment than a model in which the users' expectations are not taken in account.

For Hoffman and Bateson (2016), the scale is a diagnostic tool capable of identifying strengths and weaknesses of the service to be assessed as it is based on five dimensions of service quality, namely: tangibility, reliability, responsiveness, assurance and empathy. The original scale consists of two parts of question, in which one aims to identify the expectations of the respondents and the other their perceptions for comparison to determine the gap score for each dimension.

Golding (2005) complements by stating that managers can allocate resources to dimensions with higher gaps in service quality by using the Servqual scale to identify them.

Application of Servqual scale for assessment of information systems and IT services is varied and explored in the discussion of the results, namely: Kang and Bradley (2002), Golding (2005), Freitas et al. (2006), Yu et al. (2014), Iwasa and Tavares (2017), Luz (2014) and Souza (2017).

3. Method

The present study was conducted at the Federal Institute of Santa Catarina (FISC), which is a federal autarchy linked to the Brazilian Ministry of Education (MEC) through the Secretary of Professional and Technological Education (SETEC). The institution is based in Florianopolis and has administrative, patrimonial, financial, didactic-pedagogical and disciplinary autonomy (FISC, 2019). Nowadays, FISC has 22 campi located in all regions of Santa Catarina.

FISC is aimed at offering academic training and qualification in several areas at different levels and modalities of teaching, in addition to promoting research and development of new processes, products and services.

As for the academic personnel, there are 1,606 professors with access to the academic system through a specific module (i.e. Faculty Portal), whereas 316 education administrative technicians (EATs) have access to academic module, all these employees represent the study population.

The sample was of convenience. In practical terms, after sending electronic questionnaires, the individuals who voluntarily answered them took part of the sample.

Therefore, the sample of the present study had 140 professors and 54 EATs. It should be emphasised that employees who participated in the pre-test and those who declared not having used the support service were not considered for sampling.

In the present study, it was decided that the questionnaires would be electronically sent to the study population due to the easiness of using electronic mail.

In the present study, it was decided to use a Likert-type scale for measurement of the variables. Therefore, a Likert-type 7-point scale was chosen as, according to Garcia et al. (2022), it is the most used by studies on Servqual scale for measurement of the users' perception on the quality of information systems.

For performing the present study, it was chosen to use an adapted version of the original scale proposed by Parasuraman et al. (1988). Considering the inapplicability of the dimension "tangibility" in our context, it was decided to disregard it. In this case, this fact has already been discussed by Kang and Bradkey (2002), who stated that certain services are provided in the environment of the customer (or user) without considering tangible elements, such as physical installations of the service provider. Still, as for the disregard of the dimension

“tangibility”, Zeithaml et al. (2014) had already regarded it as of less importance among the five dimensions, which demonstrates that it is dispensable depending on the context.

Some adaptations to the wording of the questionnaire were also necessary to make it adequate to the study object. The questionnaire used in the present study was divided into two parts, in which one addressed the profile of the respondents and the other used questions of the adapted Servqual scale. It should be highlighted that different questionnaires were used by professors and EATs as each type of employee has access to the system through specific modules.

Both questionnaires applied to faculty members and EATs have an initial part of questions aimed at tracing the respondents’ profile, whereas the final part of questions is aimed at capturing the respondents’ expectations and perceptions on the service quality.

After being elaborated, the questionnaires were tested before its definitive application.

It should be highlighted that the pre-test was conducted at the FISC campus of Tubarão for both faculty members and EATs. After talking with the pre-test respondents, one opted to make some adjustments to the wording of certain questions as well as to present questions on expectations and perceptions alternatively, differently from what happens in the original questionnaire.

Google Forms service was used for application of the questionnaires.

Cronbach’s alpha coefficient was used to analyse the questionnaire’s reliability to ensure that the construct could be measured. According to Field (2024), Cronbach’s alpha coefficient is one of the most used measurements for assessment of questionnaire’s reliability. Still, according to the author, coefficients above 0.7 or 0.8 are usually considered acceptable for ensuring the reliability of the measurements.

Cronbach’s alpha coefficient suggests that the questionnaire is reliable because none of the items had a coefficient below 0.7.

About the data analysis techniques, a descriptive statistic was used to summarise the results.

One opted to use the Kolmogorov-Smirnov’s test to verify the data normality distribution, whereas Mann-Whitney’s U Test was used to assess any difference between groups.

Additionally, in the present study, regression analysis was used to identify relationships between the characteristics of the respondents and their expectations and perceptions on the service quality. Also, it should be emphasised that the type of regression model was the multiple one.

4. Results

The case being investigated in the present study involves the Federal Institute of Santa Catarina (FISC), which currently uses the Integrated System for Academic Activity Management (SIGAA) for management of its academic activities. SIGAA comprises several modules gathering academic activities related to teaching, research, extension, monitoring, distance learning, library, entrance examinations, student support office and physical intra-structure.

The original system of SIGAA, developed by the Federal University of Rio Grande do Norte (UFRN), consists of modules of undergraduate degree, post-graduation (strict and lato sensu), technical education, primary and secondary education, submission and control of projects and research fellowships, submission and control of extension actions, submission and control of teaching projects (monitoring and innovations), records and reports of the academic production by faculty members, distance teaching activities and virtual learning environment called Virtual Turma (Universidade Federal do Rio Grande do Norte, 2019).

The sample of the present study consists of faculty members and education administrative technicians (EATs). Table 1 shows the absolute and relative frequencies of each type of respondent.

Table 1. Composition of the sample

Category	N	%
Faculty members	140	72.16
EATs	54	27.84
Total	194	100.00

By observing Table 1, one can perceive that faculty members in the sample, a fact which was already predictable given that such a population was considerably higher than that of EATs.

Table 2. Characterisation of the respondents

	Faculty members		EATs		Total	
	n	%	n	%	n	%
Gender						
Female	75	53.60	32	59.30	107	55.20
Male	65	46.40	22	40.70	87	44.80
Total	140	100.00	54	100.00	194	100.00
Age						
≤ 30 years	8	6.00	13	24.00	21	11.00
> 30 and ≤ 40	67	48.00	26	48.00	93	48.00
> 40 and ≤ 50	46	33.00	8	15.00	54	28.00
> 50 and ≤ 60	15	11.00	7	13.00	22	11.00
> 60	4	3.00	0	0.00	4	2.00
Total	140	100.00	54	100.00	194	100.00
Education level						
Secondary education	0	0.00	6	11.00	6	3.00
Higher education	2	1.00	12	22.00	14	7.00
Specialisation/MBA	7	5.00	28	52.00	35	18.00
Master's degree	67	48.00	5	9.00	72	37.00
Doctor's degree	64	46.00	3	6.00	67	35.00
Total	140	100.00	54	100.00	194	100.00
Home time						
≤ 5 years	66	47.10	33	61.10	99	51.00
> 5 and ≤ 10	53	37.90	16	29.60	69	35.60
> 10 and ≤ 15	14	10.00	3	5.60	17	8.80
> 15 and ≤ 20	1	0.70	0	0.00	1	0.50
> 20 and ≤ 25	2	1.40	2	3.70	4	2.10
> 25	4	2.90	0	0.00	4	2.10
Total	140	100.00	54	100.00	194	100.00
Relationship with the coordinator						
Already a coordinator	46	33.00	12	22.00	58	30.00
Has already been a coordinator	52	37.00	27	50.00	79	41.00
Never been a coordinator	42	30.00	15	28.00	57	29.00
Total	140	100.00	54	100.00	194	100.00
Know the articulator						
Yes	107	76.43	33	61.11	140	72.16
No	24	17.14	14	25.93	38	19.59
Already an articulator	9	6.43	7	12.96	16	8.25
Total	140	100.00	54	100.00	194	100.00

In the users' daily activities, there are course coordination tasks which may require the use of specific applications of the system. Table 2 lists the absolute and relative frequencies of the respondents in their role as coordinators. One can observe a balance between respondents who are coordinators, those who had been coordinators and those who never had such an experience.

There is also the function of articulator, who is the person responsible for articulating and assisting support for the system in each campus, regardless of being a coordinator or not. The articulator is often supposed to directly intermediate demands and requests made by faculty members and EATs with responsible sectors for maintenance and/or guidance regarding the system in question. As shown in Table 2, one can find that 80.41 percent of all the respondents know (or themselves as such) the local articulator at their campi. Although small, a considerable portion of the sample responded not to know the local articulator.

Descriptive statistics of the answers given by our sample is listed in Table 3 separately, that is, for faculty members and EATs. As for the second part of the questionnaire, one can highlight that the questions on respondents' expectations and perceptions on the service quality were numbered from 1 to 36, with the first 18 referring to expectations and the final 18 referring to perceptions.

Table 3. Mean, standard deviation and Mann-Whitney's test between faculty members and EATs

Item	EATs		Faculty members		Mann-Whitney U	Test Sig.
	M	SD	M	SD		
Expectation						
Item 1	5.87	1.10	5.86	0.11	3631.5	0.657
Item 2	5.93	1.11	5.96	0.12	3400.5	0.248
Item 3	5.19	1.65	5.51	0.13	3357.0	0.212
Item 4	5.89	1.16	5.93	0.11	3570.5	0.528
Item 5	5.87	1.23	5.68	0.13	3621.0	0.635
Item 6	5.74	1.28	5.89	0.12	3376.0	0.224
Item 7	5.89	1.22	5.81	0.12	3728.5	0.877
Item 8	6.02	1.21	6.12	0.11	3425.5	0.269
Item 9	5.17	1.62	5.34	0.13	3533.5	0.471
Item 10	6.07	1.23	5.96	0.12	3744.0	0.912
Item 11	5.89	1.25	5.89	0.12	3669.0	0.737
Item 12	6.04	1.08	6.02	0.10	3684.0	0.770
Item 13	5.96	1.03	6.04	0.10	3452.0	0.319
Item 14	5.39	1.48	5.89	0.11	2972.5	0.016*
Item 15	5.85	1.31	5.75	0.13	3710.0	0.833
Item 16	5.56	1.40	5.85	0.11	3322.5	0.172
Item 17	5.78	1.27	6.06	0.11	3251.5	0.107
Item 18	5.76	1.30	5.89	0.13	3362.5	0.207
Perception						
Item 19	4.33	1.44	4.44	0.13	3619.5	0.641
Item 20	4.93	1.61	4.66	0.15	3478.5	0.382
Item 21	4.09	1.66	4.19	0.14	3662.0	0.732
Item 22	4.20	1.52	4.31	0.14	3584.5	0.570
Item 23	3.91	1.64	3.70	0.14	3514.0	0.440
Item 24	3.98	1.58	3.87	0.15	3664.5	0.738

Item 25	4.39	1.65	4.13	0.13	3418.0	0.293
Item 26	4.65	1.85	4.76	0.15	3662.0	0.733
Item 27	3.74	1.73	3.74	0.14	3773.5	0.985
Item 28	4.46	1.66	4.18	0.15	3455.0	0.346
Item 29	4.24	1.55	3.87	0.15	3339.0	0.202
Item 30	4.91	1.67	4.84	0.15	3764.5	0.964
Item 31	4.81	1.44	4.57	0.13	3372.5	0.235
Item 32	4.44	1.67	4.37	0.16	3778.0	0.995
Item 33	4.44	1.64	4.21	0.14	3534.5	0.476
Item 34	4.43	1.68	4.17	0.15	3484.5	0.392
Item 35	4.48	1.66	4.43	0.14	3764.0	0.963
Item 36	4.44	1.70	3.95	0.14	3077.0	0.041*

Note. *p < .05

Table 3 lists the descriptive statistics of the answers given by EATs, in which some points can be analysed. About expectations, for example, one can perceive that question 10 had the highest mean value among the EATs. This question addresses the EATs' expectations on the trust to the users conveyed by a support team. Considering that this question had a mean value of 6.07, one can perceive that EATs have a high expectation on the trust conveyed by a support team. On the other hand, still as for the expectations, question 9 "Excellent support teams are never too busy to meet the customer's demands" had the lowest mean value among the respondents, suggesting that EATs have lower expectations about this item compared to the others.

About the perceptions, question 27 "The SIGAA support team are never too busy to meet the demands" had the lowest mean value among the EATs. Given the mean value of 3.74, it was understood that the respondents consider that this question was the least reliable one. On the other hand, question 20 "When you have a problem, the SIGAA support team demonstrate a sincere interest in solving it" had the highest mean value, suggesting that the respondents believe that there is a sincere interest on the part of the support team in solving problems.

The answers given by faculty members were also analysed. For example, as for the expectations, it was found that question 8 "Excellent support teams are always willing to help the customers" had the higher man value, totalising 6.12 points. On the other hand, question 9 "Excellent support teams are never too busy to meet the customer's demands" had the lowest mean value, totalising 5.34.

About the perceptions of faculty members, question 30 "The SIGAA support team are always attentive to you" had the highest mean value, totalising 4.84. About the other questions, this suggests that the faculty members perceive the attention paid by the SIGAA support team as satisfactory. On the other hand, question 23 "SIGAA provides error-free registrations" had a mean value of 3.70, being the lowest one for the faculty members' perception. This suggested that this item might be improved.

Mann-Whitney's U test indicates that there was statistical difference in questions 14 and 36 only at a significance level of 0.05, that is, the EATs' and faculty members' expectations were statistically different in question "Excellent support teams pay individual attention to customers", whereas the EATs' and faculty members' perception on quality was statistically different in question "The SIGAA support team understand its specific needs as users of the system". The results of the tests allowed concluding that although EATs and faculty members have distinct positions at FISC, their expectations and perceptions of service quality are very similar, being different in two questions only.

Considering that the Mann-Whitney U test showed that the EATs' and faculty members' expectations and perceptions were not different in 94% of the total questions (34 out of 36), we opted to further analyze the answers together, totaling a new sample of 194 subjects. This percentage shows the marked similarity in perception between the two groups. This result diverges from several prior studies that indicate employees in different roles usually have different expectations and perceptions of quality, as reported in Soares et al. (2023a; 2023b).

Table 4 lists the gaps found in each item of the questionnaire applied, as well as those found in the dimension Servqual.

Table 4. Gaps

Question	Expectation	Perception	Gap
Reliability	5,78	4,27	-1,51
19 Excellent support teams have employees who pay personalised attention to customers	5,87	4,41	-1,46
20 Excellent support teams are aimed at the customers' best interest	5,95	4,73	-1,22
21 Excellent support teams understand their customers' specific needs	5,42	4,16	-1,26
22 When the SIGAA support team promise to make something in a given deadline, they do it.	5,92	4,28	-1,64
23 When you have a problem, the SIGAA support team demonstrate a sincere interest in solving it.	5,73	3,76	-1,97
Responsiveness	5,77	4,14	-1,63
24 The SIGAA support team inform exactly when the services will be provided.	5,85	3,90	-1,95
25 The SIGAA support team meet promptly.	5,84	4,20	-1,64
26 The SIGAA support team are always willing to help.	6,09	4,73	-1,36
27 The SIGAA support team are never too busy to meet the demands.	5,29	3,74	-1,55
Assurance	5,98	4,43	-1,55
28 – The behavior of the SIGAA support team members conveys trust to you.	5,99	4,26	-1,73
29 – You feel assured in your operations performed with SIGAA system.	5,89	3,97	-1,92
30 - The SIGAA support team are always attentive to you.	6,03	4,86	-1,17
31 - The SIGAA support team knows how to answer your questions.	6,02	4,64	-1,38
Empathy	5,82	4,29	-1,53
32 - The SIGAA support team pay individualised attention.	5,75	4,39	-1,36
33 - The SIGAA support team have a schedule convenient for all their users.	5,78	4,27	-1,51
34 - The SIGAA support team have members who pay personalised attention.	5,77	4,24	-1,53
35 - The SIGAA support team are aimed at the customers' best interest.	5,98	4,44	-1,54
36 - The SIGAA support team understand your specific needs as user of the system.	5,85	4,09	-1,76

As for the dimension “reliability”, the sample had a gap of 1.51. Among the questions of this dimension, item 20 had the smallest gap (1.22), whereas item 23 had the largest one (1.97).

The dimension “responsiveness” showed a gap of 1.62, with question 26 showing the smallest one (1.36), which evidences that the respondents understood that the willing to help is close to their expectations compared to the other items of the dimension. On the other hand, item 24 had the largest gap (1.95) among the questions on responsiveness, thus suggesting that accurate information on when the service will be provided is below the respondents' expectation compared to the other items of this dimension.

As for the dimension “assurance”, a gap of 1.55 was observed. Question 30 had the smallest gap (1.16), suggesting that respondents understood that this item was closer to their expectations compared to the others. On the other hand, question 29 had the largest gap (1.91), suggesting that users are less assured in performing operations with SIGGA system.

The final dimension is “empathy”, with a gap of 1.54. Question 32 had the smallest gap (1.16). On the other hand, question 36 had the largest gap (1.76), suggesting that the SIGAA support team schedule (service) was far from meeting the respondents' expectations.

One can perceive that among all the dimensions, responsiveness had the largest gap (1.62), indicating that the gap between the respondents' expectation and perception on the quality of the service provided by the SIGGA support team was distant. On the other hand, the dimension “reliability” had the smallest gap (1.51) compared to the others, suggesting that this dimension had the smallest service gap.

The last step of data analysis was performed by applying regression analysis to each Servqual item, which was used as a dependent variable. Age, gender, position (faculty member of EAT), service time, education level, being or not a coordinator, and knowing or not local articulator were the independent variables. It should be highlighted that qualitative variables were included in the model as dummies. Four items were statistically significant at a 5% level, as shown below.

Table 5. Regression models

Variable	Item 4 model				Item 9 model				Item 17 model				Item 36 model			
	B	SE	Beta	Sig	B	SE	Beta	Sig	B	SE	Beta	Sig	B	SE	Beta	Sig
(Constant)	7,364	0,872		0,000	7,176	1,105		0,000	5,699	0,868		0,000	0,449	1,181		0,704
Age	-0,024	0,011	-0,172	0,035	-0,010	0,014	-0,056	0,488	-0,001	0,011	-0,009	0,916	0,045	0,015	0,235	0,004
Time	0,007	0,020	0,028	0,737	-0,029	0,025	-0,098	0,241	-0,006	0,019	-0,026	0,750	-0,065	0,026	-0,203	0,015
Type	-0,142	0,326	-0,050	0,663	-0,283	0,413	-0,079	0,494	0,109	0,324	0,039	0,737	0,654	0,441	0,171	0,140
Male	-0,588	0,180	-0,231	0,001	-0,737	0,228	-0,230	0,001	-0,428	0,179	-0,169	0,018	0,350	0,243	0,102	0,152
EducHE	-0,718	0,627	-0,147	0,254	-1,101	0,794	-0,179	0,167	-0,578	0,624	-0,119	0,356	1,851	0,849	0,280	0,031
EducMBA	-0,957	0,575	-0,291	0,098	-1,581	0,729	-0,381	0,031	-0,741	0,573	-0,226	0,197	1,137	0,779	0,255	0,146
EducMSc	-0,780	0,623	-0,298	0,212	-1,419	0,789	-0,430	0,074	-0,020	0,620	-0,008	0,975	1,162	0,843	0,328	0,170
EducPhD	-0,704	0,630	-0,265	0,265	-1,028	0,799	-0,306	0,200	0,023	0,628	0,009	0,970	1,253	0,853	0,348	0,144
CoordYes	0,260	0,224	0,101	0,247	0,250	0,284	0,077	0,379	0,450	0,223	0,175	0,045	0,102	0,303	0,029	0,737
CoordBeen	0,181	0,239	0,065	0,452	0,054	0,303	0,015	0,860	0,144	0,238	0,052	0,546	0,058	0,324	0,015	0,858
KnowYes	0,457	0,231	0,162	0,050	0,305	0,293	0,086	0,299	0,540	0,230	0,192	0,020	0,784	0,313	0,205	0,013
KnowPro	0,748	0,382	0,163	0,052	0,394	0,485	0,068	0,417	1,112	0,381	0,243	0,004	1,132	0,518	0,182	0,030
R	0,351				0,338				0,351				0,351			
R ²	0,123				0,114				0,123				0,123			
F	2,120				1,950				2,122				2,120			
sig.	0,018				0,031				0,018				0,018			

Note. Bold: p < .05.

The regression model for item 4 was the first to show statistical significance, with ANOVA indicating a P-value = 0.018 for test F. It is worth observing that item 4 refers to “Excellent support teams provide the service within the promised time”. It was found that age and male gender influenced negatively the respondents’ expectation on this question, whereas knowing the local articulator influenced it positively.

Item 9, “Excellent support teams are never too busy to meet the customer’s demands”, also had a significant regression model at a 5% level. One can highlight that male gender and having specialisation/MBA degree influence negatively the respondents’ expectations.

Item 17, which is aimed at measuring the respondents’ expectations about “excellent support teams aimed at the customers’ best interest”, also had a statistically significant regression model at a 5% level. It was found that being coordinator/ local articulator or knowing a local articulator has a positive influence on the respondents’ expectations. On the other hand, being male has a negative influence on the respondents on item 17.

Lastly, as for the respondents’ perceptions, item 36 also had a statistically significant regression model at a 5% level for “The SIGAA support team understand the specific needs of the user of the system”. One can notice that the older the respondent, the greater the perception on the quality of this item. And the longer the service time, the lesser the perception on the quality. It was also verified that item 36 influenced positively the perception of respondents with higher education or who know the local articulator or are themselves the local articulator.

Therefore, one can see that gender was statistically significant in three of the four regression models. Also, analysis of coefficients showed that male gender has a negative influence on the respondents’ expectations on items 4, 9, and 17.

As for the SIGAA support team, knowing the local articulator was also shown to be important, according to the regression analysis. It was verified that items 4 and 17 had a positive influence on the respondents’ expectations. As well in item 36, knowing the articulator had a positive influence on the respondents’ perception on the quality. It can also be highlighted that local articulator had a positive influence on the respondents’ expectations on item 17 and perceptions on item 36 regarding service quality.

Although it was possible to observe an influence of certain variables on the respondents’ expectations and perceptions on service quality, one should emphasise that the regression coefficients were statistically significant were 11-12 percent, which shows that these regression models explain the small fraction of variation in the expectations on items 4, 9 and 17 and perceptions on item 36.

5. Conclusion

It was possible to observe that the dimension “assurance” had a higher mean value (5.98), suggesting that the

respondents' expectations on this dimension was higher than on the others in the present study. This finding is similar, for example, to those reported by Iwasa & Tavares (2017) and by Freitas, Manhães & Cozendey (2006), who assessed the quality perceived by users on IT services and identified the dimension "assurance" as having the highest expectation among the respondents.

Regarding the quality perceived by users of the service, it was found that the dimension "assurance" had the highest mean value among the dimensions (4.43), suggesting that the sample perceived this dimension as the one in which the service is better provided in terms of quality. Therefore, one can notice that the dimension "assurance" had the highest mean value regarding the respondents' expectations and perceptions on quality. It can also be highlighted that the quality expected and perceived by respondents in the dimension "assurance" was higher in the studies by Iwasa & Tavares (2017) and by Freitas, Manhães & Cozendey (2006).

The assessment of the service provided by SIGAA support team has taken into consideration the users' expectations and perceptions. In this way, it was possible to identify the gaps existing in each item or dimension through the difference between expectations and perceptions on the service quality. Such gaps were observed in all items and dimensions used in the present study, that is, the sample had greater expectations on the service quality compared to their perceptions in all items assessed. This suggests that there is a gap in all dimensions studied regarding the service provided, which in turn responds our study's third objective. It was also found that the dimension "responsiveness" which, according to Zeithaml, Parasuraman e Berry (2014), refers to the service provider's ability to respond, had the largest gap (1.62). This revealed that the sample perceived this dimension as the one requiring attention from managers. On the other hand, the dimension "reliability" had the smallest gap (1.51) among the dimensions studied, thus suggesting that the sample considered this dimension less critically than the others.

It was verified that the gaps in each dimension vary depending on the context to which the model is applied. For example, the gap in the dimension "assurance" (1.55) was larger than that in the same dimension in the studies by Iwasa & Tavares (2017) (1.03) and Freitas, Manhães and Cozendey (2006) (0.92), which indicates that our sample perceived a larger gap about assurance compared to the samples of the cited studies. As for the dimension "responsiveness", the study by Freitas, Manhães and Cozendey (2006) reported a service gap larger than that found for the same dimension in the present study, respectively, 1.68 and 1.62.

By using the Mann-Whitney's U test, it was also found that there was statistical difference in items 14 and 36 at a significance level of 0.05, that is, the EATs' and faculty members' expectations were different in only two of the 36 items, one regarding expectations and the other regarding perceptions on the quality. This finding shows that, although the employees (i.e. faculty members and EATs) have different positions in the institution, their expectations and perceptions on the quality were very similar.

Overall, by answering our study's question, it was possible to identify the employees' perception on the support provided to the academic management information system of FISC. It was observed that the respondents considered that there is a gap in the service quality regarding all items and dimensions addressed in the present study. Through the results of the present study, one can see that this finding was the same as that reported by Iwasa & Tavares (2017). In this sense, our study is not only aimed at delivering results to the institution where it was conducted but also at contributing to the research and development of a methodology to be applied to other sectors and organisations.

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Authors contributions

SVS was responsible for Project Administration and Supervision. SVS and GRS were responsible for Data Curation, Resources and Writing – Original Draft Preparation. SVS, GRS, and CRML were responsible for Conceptualization, Methodology, Validation, Investigation and Formal Analysis. SVS, GRS, CRML, TCS, and CCM were responsible for Visualization and Writing – Review & Editing. SVS, TCS, and CCM were responsible for Funding Acquisition.

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Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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