

Assessing the impact of academic library spaces on users' behaviour with the ISO16439:2014(E)

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Abstract: The importance of library assessment is widely recognized as a useful procedure to better understand and intervene in the reality of these services. In fact, evaluation methodologies seek not only to measure performances and impacts, but also to prepare a sequential action to improve services. This paper presents the research carried out to verify, describe and explain how the spaces of university libraries can affect the behaviour of their users, based on a concrete instrument - ISO 16439:2014(E) standards. Based on a case study of two academic libraries of the Universidade de Lisboa (Faculdade de Medicina Dentária and Faculdade de Psicologia e Instituto de Educação) in which an online questionnaire on these standards is applied, a theoretical reflection is developed based on the concepts of library spaces, in the university context and regarding users' behaviour towards information.

Keywords: University Libraries; Library spaces; Library assessment ; Users' behaviour; ISO 16439:2014(E)

1. Introduction

Library spaces have been changing, adapting to the appropriation that their users make of them. In university libraries, the changes carried out in recent years, with the pervasive implementation of technologies, did not deprive physical spaces of their importance in securing students in universities, though their use differs. This study analyses how students appropriate spaces and how these have impact on their users. The study consists of a transversal assessment carried out in three higher education institutions in Portugal, regarding their library spaces. It involved a survey, applied to a sample of library users. The survey complies with some of the indicators of the ISO 16439 standards, which measure the

quality of the spaces in libraries. Therefore, this instrument can measure the factors influencing the attendance of these spaces, affecting users' behaviour.

2. Literature review

Students use libraries for more than their study. They socialise and acquire different skills for their learning. These places foster their personal and intellectual development, thus contributing to their academic success. So it is essential that students have a broad understanding of the library, from the search process to the resources and services available, so that its use is positively related to their academic success (Hess, Greer, Lombardo & Lim, 2015). For an effective appropriation of these spaces, students must know how to use them, and understand and give them a meaning that is compatible with their expectations. In an exploratory study, Kuh & Gonyea (2015) discuss experiences in libraries which have impact on university students. These experiences give meaning and purpose at an academic level. The authors claim that the students who use the library more often are those who reflect more on an academic work ethic and engage in academically challenging tasks (requiring elaborate critical thinking). Therefore, they conclude that what has impact is the nature and range of experiences students have over a long period of time, rather than small actions directed towards students. The results of a very recent investigation carried out in the United States, through the ACRL (2016) - Association of College and Research Libraries, show the positive contribution of academic libraries and their spaces to students' success. These findings are part of a project called "Assessment in Action: Academic Libraries and Student Success", which involves a series of assessment projects undertaken in different types of third cycle institutions. The investigation drew four major conclusions: 1. Students who benefit from basic training by the library (in information literacy) show better performance in their courses than students who do not; 2. Using the library increases student success (positive results, for instance, in grades, persistence and completion of the academic course); 3. Institutional programmes and services whose collaboration involves the library improved student learning; 4. The development of information literacy strengthens the results of education and training in general. Additionally, the assessment results shown by this project suggest positive connections between library services and resources and student learning and success. In particular, we know that student retention improves with library training; support services for library research increase student learning; library training brings value to students' long-term academic experience; the library promotes students' academic relationship and involvement; and the use of the library space is positively related to students learning and to academic success.

Some authors (Turner, Welch & Reynolds, 2013; Browndorf, 2014) indicate a need to invest in student-centred spatial configurations. This approach should mirror administrative choices and pedagogical strategies. The success of these modern spaces in terms of support for learning, besides the reading and study areas, have to do with their functionality, in that they integrate technologies,

spaces for group work, creation labs and other flexible spaces. May & Swabey (2015) carried out a longitudinal study and also reflected on the way libraries are used and the role these spaces play on campus. They analysed five Canadian university libraries, based on topics such as the use of technology, printed materials, interaction with customer support services, the place to study alone and having a favourite place, among others. These authors show how different kinds of academic libraries (of higher education schools, institutes or universities) have common features and provide identical reactions and behaviour in their students. One of the conclusions they draw is that the design and utilization rate of spaces affect the way students assess the activities and services provided by libraries. For example, a library with a high utilization rate is not felt to be a good place for individual study, because it does not offer the silence and peace needed for this activity. So, when students pick a place to carry out their academic activities, this is a place that connects information to the social experience of learning (May & Swabey, 2015). In the wake of other authors' claims (Matthews, Andrews & Adams, 2011), they conclude that, in comparison to study places, learning in places of socialisation – on campus or in the school, but outside the classroom – catalyses interactions between students and promotes a feeling of belonging to the community. Nowadays this issue is so clear that Habich (2015) states that the LibQUAL+ tool, globally implemented in library assessment, already includes questions regarding “silent space for individual activity” and “community space for group learning and study”. Cha & Kim (2015) state that the available space, level of noise, capacity, furniture comfort and cleanliness are the elements most valued by students, though their importance differs according to the purposes for which they use the library. Likewise, Khoo, Rozaklis, Hall & Kusunoki (2016) show that spaces are constructed and appropriated perceptually, cognitively and culturally, so there are visible influences on the choices students make for using libraries according to factors like light, noise, occupancy rate, temperature, and working in group or individually. These all affect students, both physically and cognitively, leading them to certain choices or preferences, rooted in their perceptions about the territory they are in. Finally, Jager (2015) claims that students value the library as a physical space because they believe their work in this environment enables them to get higher grades in university.

The systematic review of the literature allows us to conclude that the study environment and the conditions of the space definitely influence the appropriation made by library users and, consequently, their behaviour towards information.

3. Methods

This research resorts to mixed methods, that is, quantitative and qualitative analyses, to describe and explain how university library spaces can affect their users' behaviour. The case study involves a universe of around 2,759 potential users of two academic libraries of the Universidade de Lisboa. This universe is made up of teachers, researchers, students and staff carrying out their activity at

the Faculdade de Medicina Dentária (FMD), the Faculdade de Psicologia (FP) and the Instituto de Educação (IE). Data was obtained through an online survey, via internet and in paper format, which was prepared according to the following objectives – identifying the user, assessing the impact of the library on the institution, assessing the impact of the library facilities on the user’s well-being, assessing success in research, learning and professional performance processes, and, finally, estimating the quality of the service provided by staff. These issues were converted into impact indicators defined by the international standards ISO 16439: 2014(E) - *Information and documentation -- Methods and procedures for assessing the impact of libraries* (ISO, 2014). Table 1 shows the various assessment objectives and the indicators which supported the creation of the survey. 14 questions were prepared, one of which was open-ended to allow the collection of data for the qualitative analysis.

Table 1. Objectives of the assessment and indicators of the ISO 16439:2014(E) which supported the creation of the questionnaire

Objectives of the assessment	Indicator	
Institution user belongs to and category	ISO16439:2014(6.2.2.3) – User statistics	*
Identification of user gender	ISO16439:2014(6.2.2.3) - User statistics	I. 1
Use of the library	ISO16439:2014(6.3.2.2) – Impact indicator	I. 2
Frequency of use	Library performance	I. 3
Purpose for using the library		I. 4
Safety of the facilities	Effects of the library’s impact	I. 5
Level of comfort of the facilities	ISO16439:2014(4.4.2.4) - impact on individual	I. 6
Favourable environment for study	well-being	I. 7
Feeling of equality		I. 8
Feeling of belonging		I. 9
Obtaining useful information for study and research	Effects of the library’s impact ISO16439:2014(4.4.2.3) - Indicator of more success in research, study and career	I. 10

Staff's level of empathy	Library performance	I. 11
Usefulness of the staff's answers	ISO16439:2014(6.3.2.3)	I. 12
Suggestions	Quality of the services provided	*

** Open-ended question for qualitative analysis

* Data for defining the sample

Data was collected by survey, via internet in the library facilities of the FMD and the FP-IE, and in paper format at the FMD clinics. The data collection period ran from December 2016 to January 2017. The investigation developed through an analysis of the results based on descriptive statistics (absolute and relative frequencies and contingency tables) and inference. Backed by benchmarking techniques, which observe best practices leading to better performances, solutions are suggested for future implementation in these academic libraries.

4. Results

This study took place in two libraries of three schools of the Universidade de Lisboa, namely at the Faculdade de Medicina Dentária (FMDUL) and at the Faculdade de Psicologia e Instituto de Educação (FP-IE), whose library is shared. The academic universe under study is made up of a population of around 2,759 people (students, teachers, researchers and staff).

Tables 2, 3 and 4 tell us about the universe, the sample and the data collected:

Table 2. Data collected by questionnaire at the FMD, FP and IE

Indicador	Variable	Number			%		
		FMD	FP	IE	FMD	FP	IE
I.1	Male	65	19	6	24,6	22,6	25,0
	Female	199	65	18	75,4	77,4	75,0
I.2	Attends the library	188	84	23	72,3	84	23
	Does not attend the library	72	0	0	27,7	0	0
I.3	Daily	19	29	7	7,7	34,5	29,2
	Weekly	97	37	13	39,1	44	54,2
	Monthly	61	11	2	24,6	13,1	8,3

	Less frequently	43	7	2	17,3	8,3	8,3
	Never	28	0	0	11,29	0	0
I.4	Individual study	87	47	15	37,8	56	62,5
	Space for group study	41	17	3	17,8	20,2	12,5
	Accessing publications	60	18	5	26,1	21,4	20,8
	Meeting colleagues	5	1	0	2,2	1,2	0,0
	Help from staff	4	0	0	1,7	0	0,0
	Borrowing publication	22	1	1	9,6	1,2	4,2
	Help from staff for electronic resources	5	0	0	2,2	0	0,0
	Using computer	6	0	0	2,6	0	0,0
I.5	Safe facilities	216	84	24	94,3	100	100
	Unsafe facilities	15	0	0	5,7	0	0
I.6	Uncomfortable	7	0	0	3	0	0
	Not very comfortable	25	0	0	10,7	0	0
	Comfortable	104	2	0	44,4	2,4	0
	Quite comfortable	72	23	7	30,8	27,4	29,2
	Very comfortable	26	59	17	11,1	70,2	70,8
I.7	Favourable environment for study	197	84	24	84,2	100	100
	Unfavourable environment for study	37	0	0	15,8	0	0
I.8	Atmosphere of equality	217	83	24	94,7	98,8	100
	Atmosphere of inequality	12	1	0	5,3	1,2	0
I.9	Library of own faculty	27	82	23	11,3	97,6	95,8
	Library of other faculty	46	0	0	19,3	0	0
	Other spaces of own faculty	16	1	0	6,7	1,2	0
	Other spaces of Campus	17	0	0	7,2	0	0

	At home	132	1	1	55,5	1,2	4,2
I.10	I had difficulty locating publications	30	0	0	13,1	0	0
	I had difficulty searching for resources on the internet	8	0	0	3,5	0	0
	I had difficulty finding useful information	30	0	1	13,1	0	4,2
	The information was useful regarding a subject	104	81	17	45,4	96,4	70,8
	The information was useful regarding research	44	3	2	19,2	3,6	8,3
	The information was useful in my professional activity	13	0	4	5,7	0	16,7
I.11	Staff not at all empathic	7	0	0	3	0	0
	Staff not very empathic	10	0	0	4,3	0	0
	Empathic staff	88	3	0	37,9	3,6	0
	Staff quite empathic	81	9	3	34,9	10,7	12,5
	Staff very empathic	46	72	21	19,9	85,7	87,5
I.12	Useless staff response	7	0	0	3,1	0	0
	Not very useful staff response	18	0	0	7,9	0	0
	Useful staff response	87	2	0	38,3	2,4	0
	Quite useful staff response	81	7	1	35,7	8,3	4,2
	Very useful staff response	34	75	23	15	89,3	95,8

Table 3. Constitution of the population under study

Universe				
Tipo	FMD	FP	IE	Totais
Teachers	128	58	61	247
Researchers	0	5	4	9
Students	600	959	827	2386
Staff	63	27	27	117
Totals	791	1049	919	2759
Total				2759

Table 4. Constitution of the sample under study

Sample				
	FMD	FP	IE	Outros
Number of answers	275	84	24	5
	71%	22%	6,10%	1,30%

5. Discussion of results

Regarding the universe, there are potentially 2,759 respondents, of which about 86% are students and the remaining ones researchers, teachers, staff or others. There is nothing to point out in view of this: the average number of students per teacher, in Portugal in 2014, was 10.8, according to Eurostat data, so the sample complies with national general indicators. Regarding the sample, despite the FMD universe representing about 29% of the total, this school collects 71% of the results. This is probably because of two factors: the smaller size of the institution, which allows greater interaction with the potential respondents in calling them to fill in the survey, and FMD's choice not only to distribute the survey online but then to distribute it hand to hand, in paper format. We must draw conclusions from this disparity, namely all the institutions involved complying with the pre-established manner of distributing the survey, without biasing the results. The results list as follows: 1) Regarding gender distribution, we observe a trend in line with the Portuguese higher education students' universe (female 55% - male 45%, approximately, in the national panorama (Fundação Francisco Manuel dos Santos, 2017)); about 75% - 25% in these answers); 2) The attendance rate is around 80%, but in this respect a discrepancy must be mentioned, concerning the survey dissemination: while in the FP and IE it was done via web (though most answers were collected on a computer located in the library), besides this option the FMD also chose to print and distribute the surveys in print format, collecting the vast majority of *No* answers; 3) As regards the frequency of attendance, while in the FP and IE most answers point to a daily and weekly use, in the FMD attendance is weekly or monthly, but with the particularity that this school has almost 29% answers *Less than Monthly* or *Never*. Comparing this last data with the open-answer comments, we find that this may have to do with the obsolescence of the collection, with the FMD library's physical conditions (small, with no spaces devoted to group work) and with a more practical aspect of teaching in a medicine faculty (long hours spent in clinics treating patients); 4) As for the purposes for attending the library, these are the same in all the institutions: for individual study, accessing the collection and group study; 5) The library facilities are considered safe by the vast majority of the respondents (96%); 6) The level of comfort of the libraries is also mostly perceived as positive, but there are discrepancies between the FP-IE (which consider the facilities *quite* and *very comfortable*), and the FMD, which is reported as being *comfortable*,

but regarding which 13% of the respondents choose *not very comfortable* and even *uncomfortable*; 7) The environment is perceived as being favourable for study in 100% of the cases, in the FP and IE library, while in the FMD 15% of the respondents claim that the environment is not favourable for this purpose. In this valence, despite 85% positive answers, once again we find that the library's physical conditions have an influence; 8) The library as a space of equality is a given, with over 90% positive answers; 9) The library chosen above all as a privileged space of study is one of the most inconsistent cases of this data. If on the one hand this might be due to the discrepancy in the collection method, on the other hand some dissatisfaction with the means offered by the FMD library must be included in this equation. Thus, while over 95% of the FP and IE students choose to study in the library, over 50% of the FMD students choose to study at home and, if they opt for a library, they prefer one from another institution; 10) In the item *Obtained Useful Information*, the vast majority answered positively, and the results that were negative were practically all from the FMD; 11) Finally, with respect to empathy and staff response usefulness, once again we find a substantial discrepancy: the FP and IE produce values consistently above 85% for the answers *very empathic* and *very useful response*, while the FMD has positive results, but not that positive - 20 and 15% for *very empathic* and *very useful response*, between 70 and 75% for *empathic /quite empathic* and *useful /quite useful response*, and values around 5-10% for *para not at all /not very empathic* and *useless /not very useful response*.

In short, it can be stated that Libraries are a space which provides an atmosphere of equality, which contributes positively to students', researchers' and teachers' academic results, not just in terms of the collection and physical space for individual and group work, but also regarding the support provided by staff. The discrepancy noticed in some items between FP-IE and FMD shows a less positive view of the community with respect to the latter. The FP-IE data are consistent with their annual quality reports so, despite the above mentioned discrepancies in the distribution and sample, the results should be considered truthful. FMD's results are not surprising, as the library was temporarily closed and recently moved to new facilities. The new services opened about a year ago. Therefore, FMD should reflect upon the need to provide better physical conditions to the community it serves.

6. Conclusions

Academic libraries play a fundamental role in Higher Education institutions, facilitating permanent access to knowledge, to up-to-date, quality scientific information, for teachers, researchers, students, staff and society in general.

This study was carried out in three higher education schools with different features. The Faculdade de Medicina Dentária's teaching model has a very important practical component, developed in three oral health clinics. Students and teachers spend long periods of time at the clinics exercising health care provision services. This reality explains the decision to collect students' answers

in paper format at the clinics. This way, it was possible to assess the impact of using the library in a higher education school in the field of Dental Medicine and, at the same time, divulge and assess the services offered in the library. In the Faculdade de Psicologia and Instituto de Educação, where teaching is considerably more theoretical but also includes some practical part, data collection took place at the library facilities, through the survey on the internet. The favourable results obtained in the FP-IE library assessment show that, with the necessary adjustments for the specificities of each higher education institution, the best practices of these services serve as a model for academic libraries.

The need for the FMD library to acquire more recent books in paper form was confirmed. The existence of up-to-date electronic information does not remove the need for books in paper form. The request for spaces for group study, at the FMD, is a fact related to students currently having no convenient spaces to work in group, exchange opinions and ideas and produce knowledge.

The analysis of the academic library as a space that propitiates impact and value, enhancing the teaching-learning process, is confirmed in the different higher education schools under study, regardless of their having a more theoretical or practical teaching. Research was based on several indicators of the ISO16439(E) international standards. This assessment tool corresponded well to the needs of the study conducted.

The evidence observed supports the hypothesis that academic library spaces influence the behaviour of teachers, researchers and students, and play a fundamental role in the teaching, learning and research processes.

The following limitations were observed in this study: the survey via internet should present the possibility of a multivariate answer, that is, it should be possible to give several answers to the same question instead of accepting one and only one answer for each question (as was the case in this study); the questionnaire for data collection was carried out on the academic population via internet. This process provides a quick response, control throughout the collection of answers and a standardised range of information. Despite these advantages, a bias arises in the selection of data related to this research method. Perhaps people working more continuously with electronic information services reveal greater availability to respond to this kind of research. In order to minimise this problem, data collection by survey in future investigations could be carried out simultaneously in two distinct formats – digital and in print – and outside the library facilities.

Another possibility is to study the changes found in users of academic library services. It is useful to understand to what extent libraries have changed habits, or transformed in some way the teachers, researchers and students of the Portuguese academic community. To have a sense of the current practices of

teaching, learning and knowledge production using the information that exists on the internet. To understand how people, of this particular community, use and appropriate the knowledge existing in the library. To understand which skills they have to find useful information. To perceive their feelings regarding the paradigm of electronic scientific information.

Case studies such as this one, with several libraries of the same University, or with national or foreign higher education institutions, are practices to be implemented in order to analyse best practices and to make improvements.

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