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Disciplinary standards of IL education: An international comparison of LibQUAL+ results

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Abstract: This paper attempts to show that LibQUAL+ tool can be used to measure how the perceptions of and standards required for library instruction differ across disciplines in the different university libraries from different countries. The paper suggests, firstly, that the quality of library IL instruction does not directly correlate with the resources put into the instruction, secondly, that a high-quality IL instruction raises demands for more IL instruction, and thirdly, that good IL instruction leads to consistent standards of IL education in different disciplines. Furthermore, interesting disciplinary differences in the satisfaction of and demands to IL education are revealed.
Keywords: LibQual+, LIBER, information literacy, acacemic libraries, user satisfaction, Finland, Estonia, France, Denmark

1. Introduction

The LibQUAL+ survey was initiated in 2000 by the Association of Research Libraries (ARL) and library partners in the US to measure users' perceptions of library service quality. LibQUAL+ is developed on the basis of the SERVQUAL instrument. Both tools assess the perceptions of users to calculate service quality gaps between the customers' expectations and perceptions. (Thompson, Cook and Kyrillidou 2006)

To date LibQUAL+ has been used at over 1300 institutions in over 29 countries and there have been over 2.3 million respondents (Cook et al. 2016). LibQUAL+ is also widely used in European libraries and the availability of translations has further stimulated its growth (Voorbij 2012). In 2016, the working group of LIBER (Association of European Research Libraries) group initiated an international study using LibQUAL+ as a research tool.

The aim of this paper is to explore whether library instruction perceptions and satisfaction differ across usage groups in four European university libraries. The analysis is based on the 2016 LibQUAL+ data of the Turku University Library, the University of Tartu Library, the Aarhus University Library and the

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University of Caen Normandy Library. Of these libraries, the University of Caen Normandy Library was the only one that did not take part in the LIBER's international study.

One of the advantages of LibQUAL+ is that it offers a standardized measure across libraries allowing peer comparison and sharing of best practices. The libraries consider its benchmarking opportunities as very important. Because LibQUAL+ was designed to be used across a diverse group of institutions, it is a generic measure of user satisfaction (Thompson et al. 2006). Library services are by nature processes involving the use of various kinds of resources in various operational contexts (Hakala and Nygrén 2010). Creaser (2006) states that statistical benchmarking suits best to the identification of potential of good practice and areas of improvement. In order to be able to interpret the data an analysis of the contextual information is important.

2. Literature review

The LibQUAL+ survey has been widely discussed in research literature (e.g. the bibliography on the LibQUAL website (LibQUAL 2016)). There has also been some critique, for example, on the validity of the gap theory for assessing service quality. It has been questioned, whether users can distinguish the different levels of measurement (Yu et al. 2008). However, a recent study by Natesan and Aerts (2016) showed that the respondents were clearly able to distinguish between the levels of measurement in gap theory. Some studies, on the other hand, have focused on the perceived score instead of the gap between the perceived and expected score (e.g. Fagan (2014), Lane et al. (2012)).

LibQUAL+ survey's lack of contextual information has been noted for example by Thompson et al. (2006) and Lilburn (2017). The results of Thompson, Cook, and Kyrillidou (2005) suggest that LibQUAL+ is more a satisfaction than an outcomes measure, because academic outcomes may be mediated by other academic support factors. However, the respondents are also offered an open-ended question to provide additional comments about library service quality. By performing qualitative analysis of the comments libraries may gain additional context about the nature of user perceptions and in many libraries these are used internally to improve library operations (Neurohr et al. 2010).

There are only a few studies that explicitly deal with the opinions of the students and staff members on IL services across disciplines or internationally. For example, Pinto and Sales (2015) researched the self-assessments of Spanish university students regarding searching, evaluation, processing and communication-dissemination. Other studies have focused on the faculty views and experiences of library and library instruction (e.g. Thompson (2014), Bury (2011), Pinto (2016)).

The comparison of results from different studies is made difficult by the differences in methodologies and ways of grouping subjects, as some have used

high-level categories whereas others have adopted a more granular approach. In general, the arts and humanities disciplines seem to have more positive perceptions of the library whereas the science and engineering are less engaged.

3. Methodology

The study was based on the quantitative raw data derived from the 2016 LibQUAL+ assessment reports of the Turku University Library, the University of Tartu Library, the University of Caen Normandy Library and the Aarhus University Library. The authors of this article received the data as excel files from the involved libraries. From the Turku University Library and the University of Tartu Library the authors received additional information on the number of hours librarians used in average for each student taking a library IL course.

The data included responses to the five standard LibQUAL+ questions on information literacy from all four libraries and responses to one of the additional LIBER questions ("Up-to-date teaching that meets my current needs") from libraries that had participated in the LIBER survey. In the standard information literacy questions the respondents rated their perceived level of satisfaction for each item on a scale from 1-9 (1 least satisfied - 9 most satisfied). The LIBER question was answered by the respondents three times on a nine-point scale: the minimum level, the desired level and the perceived level. The score indicates how important the customer considers the aspect with one being the lowest and nine the highest level.

The goal of this paper is to explore whether the value of the LIBER IL question reflects the means of the five standard IL questions in LibQUAL+. Secondly, the article aims to examine, whether and to what extent there were similarities in the patterns of response between the different universities in different countries and subject groups.

For the purposes of this article, we used only a quite vague understanding of what information literacy means. In effect, we might say that in this article IL was defined through the five standard questions and the additional LIBER question:

- The library helps me stay abreast of developments in my field(s) of interest.
- The library aids my advancement in my academic discipline or work.
- The library enables me to be more efficient in my academic pursuits or work.
- The library helps me distinguish between trustworthy and untrustworthy information.
- The library provides me with the information skills I need in my work or study.

- LIBER question: Up-to-date teaching that meets my current needs.

Because of the generality of the questions, we were not able to take into account the differences in the more general context of IL education in the individual libraries. We thus ignored questions such as, whether the IL education was given in e-courses or regular courses.

The participating libraries can individually customize the discipline categories to reflect the local environment (Thompson et al. 2005). This study was based on these customized discipline categories. However, the response rates were insufficient to generate meaningful analysis at the level of each discipline. As a result it was necessary to group responses into eight broad subject areas: human sciences, natural sciences, medicine and related subjects, law, education, economy, engineering/technology and others. Particularly, because in one of the libraries humanities and social sciences had been grouped together, they had to be classified together under the name "human sciences".

Discipline	**n**	**%**
Human sciences	1770	36.00 %
Medicine and related subjects	792	16.11 %
Economy	653	13.28 %
Education	606	12.33 %
Natural sciences	364	7.40 %
Law	346	7.04 %
Engineering/Technology	98	1.99 %
Others	287	5.84 %
Total	4916	100 %

Table 1: Respondents from each discipline category.

4. Participants

Participants included 4916 students and faculty members who responded to the LIBER question (n=1183) and/or to the IL questions (n=4916). The number of responses for each IL question was Q1:2772, Q2:2909, Q3:3048, Q4:2926 and Q5:2761. Table 2 presents the share of the respondents of the total focus group population in the involved universities.

Library	Population N	Respondents (standard questions)		Respondents (LIBER question)	
		n	%	n	%
Turku	22738	1439	6.33 %	903	4.18 %
Aarhus	36278	1949	5.65 %	980	2.84 %
Tartu	16050	504	3.14 %	280	1.74 %
Caen	37805	1024	2.71 %	-	-
Total	112871	4916	4.39 %	1183	2.78 %

Table 2: Population and the number and percentage of respondents by university.

The response rates from undergraduates were the highest in all surveys except for Aarhus. Altogether, the IL questions sample included 49.29 % undergraduates, 45.79 % graduates and 4.92 % faculty members. The shares for the LIBER question sample were respectively 48.27 %, 47.32 % and 4.42 %. In 2016, the Aarhus survey focused only on students.

All the participant universities are multi-disciplinary. The University of Turku consists of seven faculties: Faculty of Humanities, Faculty of Mathematics and Natural Sciences (since 2017 Faculty of Science and Engineering), Faculty of Medicine, Faculty of Law, Faculty of Social Sciences, Faculty of Education and Turku School of Economics. Turku University Library introduced the LibQUAL+ survey in 2010 and reports have been issued since then in 2012 and 2016.

The University of Tartu has four faculties: Faculty of Arts and Humanities, Faculty of Social Sciences, Faculty of Medicine and Faculty of Science and Technology. The introduction of four faculties is recent, and the old faculties are now named as institutes under the four faculties. The University of Tartu Library has been participating in the LibQUAL+ survey since 2016.

The Aarhus University has four faculties: Faculty of Arts, Aarhus BSS (School of Business and Social Sciences), Faculty of Health and Faculty of Science and Technology. The LibQual+ survey was introduced in 2004 in Aarhus School of Business.

The University of Caen Normandy consists of seven faculties: Faculty of Law and Political Sciences, Faculty of Economics, Business Management, Geography and Land Settlement, Faculty of Humanities and Social Sciences, Faculty of Health, Faculty of Psychology, Faculty of Sciences, Faculty of Foreign Languages, Faculty of Science and Technology of Physical Activities and Sports (STAPS). In addition there are six institutes and schools. The University of Caen Normandy Library has used LibQUAL+ since 2012.

In the 2016 survey, the Turku University Library and the Aarhus University Library used the shorter LibQUAL+ Lite version whereas the University of Tartu Library and the the University of Caen Normandy Library used the full version. In the Lite version each participant answers to only a randomly selected subset of items (Cook et al. 2016).

5. Results

5.1. the quantity of IL education correlate with its quality?

A natural assumption is that the more resources a library puts in IL education, the better in quality that education will be. If the opinion of the customers on the quality of IL education is seen as a reliable symptom of its real quality, survey like LibQUAL+ offers an easy test for this hypothesis. In the study group, there were at least two different quantities relevant for such a purpose. Firstly, one could look at the standard IL questions of the LibQUAL+ survey and especially their average. Secondly, one could take into account the LIBER-specific question on the quality of IL education and especially its perceived value in different libraries. As a measure of the resources used, we took the number of hours librarians used in average for each student taking a library IL course.

On basis of the numbers, it is relatively easy to show that the hypothesis is, despite its plausibility, most likely not correct. Considering just the libraries of Turku and Tartu, Turku had clearly better numbers in both the average of IL questions and the perceived value of LIBER question. Still, it used only a fraction of hours for the IL education of each student compared to Tartu. This comparison appears to suggest that the quantity of IL education does not correlate with its quality – increase in one had no effect on the other.

Library	**Perceived value of LIBER question**	**Average of IL questions**	**Hours used for each student**
Turku	7.17	6.77	0.1
Tartu	6.41	6.70	4.5

Table 3: Perceived quality of IL education compared with time used for IL education.

5.2. Standards for IL education

Assumedly, the IL questions of LibQUAL+ survey should somehow represent the customers' opinion on the IL services of the library. Since a central part of these services is the IL teaching, it would make sense if the perceived value of the LIBER question on IL teaching ("Up-to-date teaching that meets my current needs") would somehow reflect the IL questions and especially their average. In other words, the higher the average of IL questions, the higher one would expect the perceived value of LIBER question to be. Yet, no clear connection seems to exist between these two quantities – while Turku University Library clearly had the highest score in both average and perceived value, Aarhus had the smallest score in the average of IL questions and Tartu in the perceived value of LIBER question.

A more interesting possibility is to consider whether one might find connections between the average of the IL questions and the perceived value of LIBER question, when one takes into account the minimum and desired standards given by the survey takers in the LIBER question. The problem is to choose suitable quantities. The so-called adequacy and superiority scores (respectively, the difference between perceived and minimum scores and the difference between perceived and desired scores) both take into account only one of the standards in question and are thus one-sided and inadequate measures if one wants to consider the interplay of the perceived value with both minimum and desired standards.

We propose to compare the average of the IL questions with what we call Performance Against Standards –percentage (shortly PAS). In effect, PAS answers the question what percentage is the difference between the perceived score and the minimum score of the difference between desired score and the minimum score, or as a formula, $(P - M) / (D - M)$. PAS represents in a single quantity some characteristics of a gap analysis that can be seen with one glance from its visual representation. For instance, if $PAS < 0$ %, the perceived quality of a service is not even on the level of minimum standard, if $0\ \% < PAS < 50\ \%$, the perceived quality of a service is closer to minimum than desired standard, if $50\ \% < PAS < 100\ \%$, the perceived quality of a service is closer to desired than minimum standard, and if $PAS > 100$ %, the perceived quality of a service has exceeded even the desired standard.

Comparing the average of the IL questions with PAS in the dataset shows a surprising connection – the higher the average, the lower was PAS. It would require a more extensive study with more participants and several year follow-up to decide whether this connection indicates a more general regularity, but it does suggest interesting conclusions. It appears that a small rise in the perceived quality of IL education does not necessarily raise the customer standards for IL education, but a more significant rise in the perceived quality of IL education does raise also the customer standards for IL education. In other words, the

more successful a library is in making their customers critical consumers of information, the more critical and demanding they will also be when it comes to information given by IL teachers.

Library	Perceived value of LIBER question	PAS of LIBER question (%)	Average of IL questions
Turku	7.17	45.8	6.77
Aarhus	6.71	73.2	6.54
Tartu	6.41	52.1	6.70

Table 4: Perceived value and PAS of LIBER question compared with the average of IL questions by universities (Caen excluded).

5.3. IL education in different disciplines

The dataset was classified into eight different discipline categories: natural sciences, human sciences, medicine and related subjects, law, education, economy, engineering/technology and other. The discipline division was based on the discipline divisions in the LibQUAL+ surveys of individual libraries. Particularly, because in one of the libraries humanities and social sciences had been grouped together, they had to be classified together under the name "human sciences".

Some clear tendencies stand out from the whole dataset. When both the average of IL questions and the PAS of LIBER question are considered, the engineering/technology has clearly the lowest scores of all disciplines. Even with all individual IL questions, the respondents from the engineering/technology discipline had given lowest scores. Individual libraries showed great variation as to what was the discipline with the lowest scores, but engineering/technology discipline still had given consistently low scores in all libraries where that discipline was among the subjects taught by the respective university.

No as clear a candidate can be found for the highest scores. Exceptionally high in the overall results is the PAS score of medicine and related subjects discipline, but the average of IL questions for medicine is only the third best in the whole dataset. When considering the individual IL questions, medicine and related subjects is consistently good, if not always at the top of the disciplines. But a large part in the high PAS of medicine is played by its low standards for IL education. In other words, because respondents from the field of medicine did not have high expectations of IL education, even an average IL education appeared more than adequate to them.

A more viable option for the status of discipline where libraries succeeded best in IL is human sciences, which has the second best score in the average of IL

questions and second best PAS for the LIBER question, and in addition, quite high results for individual IL questions. If we restrict our attention to those libraries, in which the distinction between humanities and social sciences can be made, the average score of IL questions for humanities is the highest, while its PAS is still the second highest, but considerably closer to the highest PAS of Medicine. This provides more evidence to the conclusion that respondents from human sciences, and especially from humanities, think most highly of the IL services of libraries.

To summarize, we found reasons to believe that while respondents from the field of technology were the most critical of the IL services of libraries, respondents from the field of human sciences in general and humanities in particular were the most appreciative of the IL services of libraries. All in all, this result appears to follow the rather traditional stereotype of libraries – humanists see the value of libraries more clearly than people from the applied hard sciences.

Discipline	**Average of IL questions**	**PAS of LIBER question**
Medicine and Related Subjects	6.57	75.5 %
Human Sciences	6.61	58.8 %
Law	6.41	57.9 %
Natural Sciences	6.49	56.4 %
Economy	6.49	50.9 %
Education	6.66	50.4 %
Engineering/Technology	5.64	37.5 %
Others	6.46	52.4 %
All	6.55	58.4 %

Table 5: IL scores by discipline in all universities (humanities grouped together with social sciences as human sciences).

Discipline	**Average of IL questions**	**PAS of LIBER question**
Medicine and related subjects	6.60	75.5 %
Humanities	6.76	62.1 %
Law	6.51	57.9 %
Natural sciences	6.71	56.4 %
Social sciences	6.70	52.7 %
Economy	6.53	50.9 %
Education	6.67	50.4 %
Engineering/Technology	6.61	37.5 %

Others	6.53	52.4 %
All	6.65	58.4 %

Table 6: IL scores by discipline in universities where human and social sciences could be distinguished.

5.4. Standards of IL education in different disciplines

In most of the libraries studied there were great disciplinary differences in the minimum and desired standards of IL education. The exception was Turku University Library, where the standards were consistently high.

When the minimum standards of IL education were considered in the whole data, the different disciplines could be classified into four groups:

1. Minimum under 5.5: Law
2. Minimum between 5.5 and 5.9: Engineering/Technology and medicine and related subjects
3. Minimum between 5.9 and 6.0: Economy, human sciences and natural sciences
4. Over 6.0: Education

What makes this progression interesting is that it is partially reflected in the results of the individual libraries, except Turku University Library. In particular, the progression of "law – medicine – human sciences + economy – education" in the minimum standards was a constant for all the libraries, excluding Turku University Library. Here the place of human sciences was the simplest to explain due to it containing two quite different sub-disciplines. When humanities and social sciences were considered independently, their place in the progression varied significantly from one library to another, leaving thus only the progression of "law – medicine – economy – education".

Further studies would be required to see whether these disciplinary differences in the minimum expectations of library IL education occurred in other libraries also. If they did, explanation would have to lie in the differences between the disciplines and not in those between the individual libraries. For instance, we might speculate that law students and researchers across Europe had less need for electronic resources than students and researchers in the field of education or perhaps even that electronic resources for the discipline of law were not as much available as for the discipline of education, so that the latter would feel more need for library education on the use of databases and on the search of electronic resources.

Another interesting question is why the results of Turku University Library were an exception to the norm. One might speculate that the lack of disciplinary differences is due to similar reasons as the high standards demanded by the respondents in Turku for IL education. That is, the high perceived quality of the

IL education would be reflected also on the fact that students and researchers from all disciplines have similar ideas about the standards of good IL education.

6. Conclusions and suggestions for further study

Our first conclusions concern the use of LibQUAL+ as a research method. We have tried to show that LibQUAL+ can be used as a more versatile tool in studying libraries, especially if questions designed specifically for certain purposes are used and if the dataset is analysed in a deeper level. For instance, we have shown that LibQUAL+ might be fruitfully used a) in evaluating the quality and impact of IL-education, b) studying the standards customers give for IL-education and c) examining the differences in the appreciation of and demands for IL-education from one discipline to another.

Beyond this metalevel result of how to use LibQUAL+, we found out some interesting things about the three issues just mentioned. Due to the selective nature of the study group, the results we found for these three questions must be taken with a grain of salt. Still, they are interesting as suggesting potential paths for further study.

When considering the impact of IL education, our study suggested that the perceived quality of IL education did not correlate with the resources used for IL education. This does not mean that the resources would have no effect on IL education, merely that it is not the only factor that does. It would require a more extensive research of the practices of IL education in different libraries to really find out what factors do affect the impact of IL education.

An interesting result was that the appreciation of IL education was greatest in humanities and lowest in the field of engineering. This accords well with information on the general use of library in these fields. Previous studies have implicated that humanities have been one of the biggest users of library resources, while engineering students were the least engaged library users (Collins and Stone 2014).

Concerning the standards of IL education, it was a notable result that improvements in the quality of IL education could lead to raised demands for IL education. Another interesting result was that higher quality of IL education correlated with a more homogenous perception of the standards and quality of IL education across all disciplines. Indeed, one might naturally suppose that a certain consistency is a factor in the quality of IL education.

The final and perhaps the most perplexing result is the surprisingly consistent variation in the required standards for IL education across different disciplines. This is an area where more research would most be needed, firstly, to ascertain that these disciplinary differences can be generalized from this study set to all European libraries, and secondly, to find proper explanations for the differences.

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