

## **AN ASSESSMENT OF THE EFFECTIVENESS OF LIBRARY RESOURCES AND SERVICES IN SUPPORTING RESEARCHERS' INFORMATION NEEDS**

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### **ABSTRACT**

As one of the supporting departments of a university, the academic library plays an important role in providing essential information resources and services to the researchers. Changes in information technology have impacted libraries due to changes in the format of information resources and the information seeking behavior of users. Technology has transformed the way researchers seek, obtain and use information. Libraries therefore need to critically examine the effectiveness of their services in fulfilling their researchers' information needs. An assessment of the effectiveness of library services has been conducted at an academic library based on selected criteria in four domains stated in the literature; 1) resources 2) services 3) library/stakeholders interactions and 4) access. The result from the survey has provided ideas about the strengths and the weaknesses of the library services from the perspective of researchers. The research also studied the relationship between demographic characteristics and library activities of the researchers and their perceived effectiveness of the library services in supporting their information needs.

Keywords: Library Assessment; Outcome Assessment; User Studies; Effectiveness of Academic Library; Researchers' Information Needs

### **INTRODUCTION**

Libraries in universities are partners in helping their researchers both through traditional ways (providing research collections, bibliometrics, research skills training and document delivery) and through more recent innovations (establishing institutional repositories, advice on copyright and intellectual property and involvement in knowledge management activities) (Council of Australian University Librarians, 2008).

Technological development does not change the information that researchers need but changes the way in which it is being delivered (Pool, 2009). Changes in information technology have resulted new format of information sources and have caused a change in the information seeking behavior of users. These have given an impact to library services. We now see the transformation in the way researchers seek, obtain and use information. With the existence of electronic resources, remote access, easy searching and browsing have become common features of research. Researchers are more concerned about locating and extracting information with little attention to the sources from where the information was obtained. Most of the time they seek from sources that are easy and convenient, timely and provide plenty of information (Dougherty, 1991).

The decline in physical library usage by researchers together with unclear evidence of electronic information access had left the library without any hard data to justify their role in meeting the information needs of researchers. The evidence-based data such as computer logs in some library system could only provide overall usage report without any specific categorization. Therefore, there are no supporting data that can be used to measure researchers usage of information sources provided by the library. Some researchers claimed that they do not need to use library at all, not recognizing that much of

the electronic sources used are being purchased by the library. Others are convinced they still use libraries more than they actually do. This shows that there is a mismatch between practice and rhetoric (Cannell, 2007).

Since the capability of academic libraries is perceived to be at risk in today's changing environment (Singh, 2007), academic libraries need to critically examine the effectiveness of library services and continue the challenging task of understanding the information needs and information seeking behaviors of the communities they serve. Webb, Gannon-Leary and Bent (2007) stated that libraries need to take stock of where they are now, list the services and resources they currently provide, ask users what they want from the library and combine the results of these investigations with new ideas and developments in order to provide a comprehensive and effective service to researchers.

Effectiveness is one of the aspects measured in performance assessment of libraries. As shown in Figure 1 effectiveness may be seen as an outward-looking measure which shows either the institution's aims or objectives have been met by comparing the aims and the outcome. One way of measuring the effectiveness of a library is to test satisfaction level of users with elements of any related services, for example, by checking the availability of books and periodicals (Morgan, 1995).

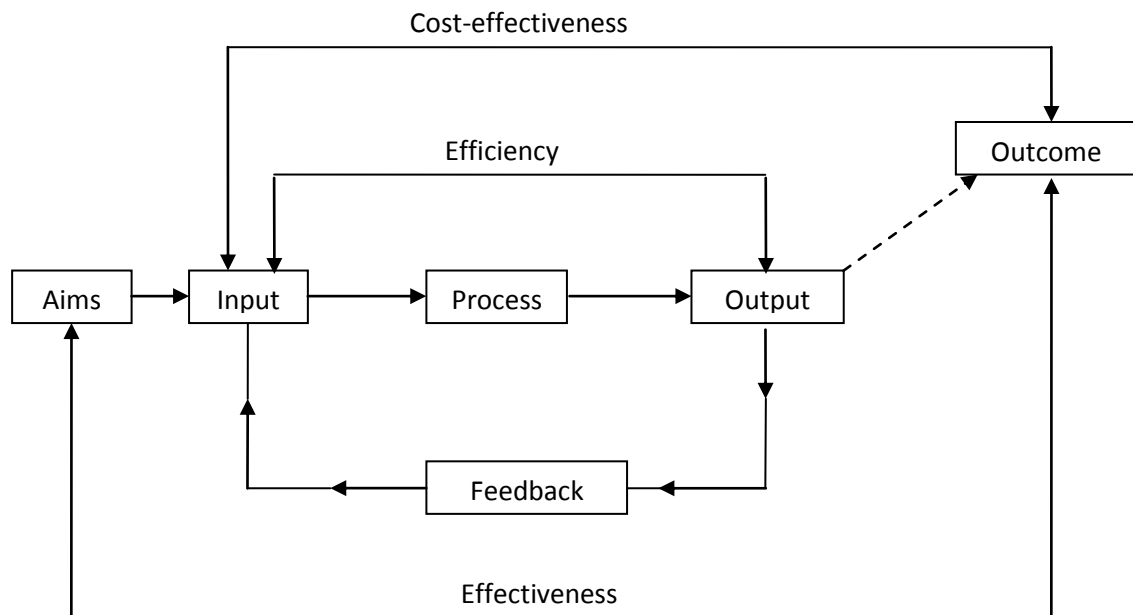


Figure 1 Model of performance assessment (Sources: Morgan, 1995)

McDonald and Micikas, (1994) stated that effectiveness can be measured through organizational level approach which study an organization as a whole as used by Cameron (1978) or sub organizational level approach which study units of the organization as used by Lancaster (1993).

In organizational level approach, Cameron (1978) who studied effectiveness in institutions of higher education studied four major models of organizational effectiveness in order to identify criteria of assessment. These models are:

- Goal attainment model, in which goals and objectives of an organization have been defined and measurement were based on the achievement of these goals.
- System resource model, which assessed an organizational ability to secure resources (staffing, budget, buildings) from its environment

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- Internal process model, which used internal organizational activities as the dominant criteria of effectiveness
- Constituency satisfaction model, in which organization was assessed by the degree to which its constituents or primary stakeholders have been satisfied.

Traditionally, libraries used the systems resource model to measure their effectiveness in the belief that by counting inputs they can directly indicate their library effectiveness. However, inputs do not necessarily relate to output and they cannot exactly measure effectiveness. Libraries that adopted the goal attainment model have discovered problems in finding the stakeholders' agreement on library goals. Those that used the internal process model realized that it was primarily an efficiency model. Finally, when Childers and Van House (1989 & 1990) tested with the multiple constituencies model, it was found to be a useful model for assessing library effectiveness (Cullen and Calvert, 1995).

### OBJECTIVES OF THE STUDY

- 1) To examine the effectiveness of the resources and services of an academic library from the perspective of researchers.
- 2) To examine the researchers' perceived effectiveness of the library resources and services in relation to their demographic characteristics.
- 3) To examine the researchers' perceived effectiveness of the library resources and services in relation to their library activities.
- 4) To identify the researchers requirement in the provision of library resources and services in supporting the information needs of researchers.

### RESEARCH FRAMEWORK

The dependent variables in this study are the effectiveness of library resources and services. This is clearly reflected in the research framework as represented in Figure 2. As effectiveness is a multidimensional construct (Cameron, 1978), the assessment of this construct was based the four domains stated in McDonald & Micikas (1994). As for this research, the criteria identified for the domains are:

**Domain One: Resources** – (criteria to assess the comprehensiveness of library resources)

**Domain Two: Services** – (criteria to assess the effectiveness of library services such as sufficiency of searching tools, availability of assistance from library staff when needed, timeliness of Interlibrary Loan and conduciveness of library environment)

**Domain Three: Access** – (criteria to assess the accessibility of library resources and frequency of use of library resources and services)

**Domain Four: Library/Researchers Interaction** – (criteria to assess the effectiveness of the interaction between library and researchers based on the researchers' awareness of library resources and services and sufficiency of ways for researchers to interact with the library)

As for the independent variables, it is reflected in Figure 2. They are researchers' demographic characteristics and researchers' library activities.

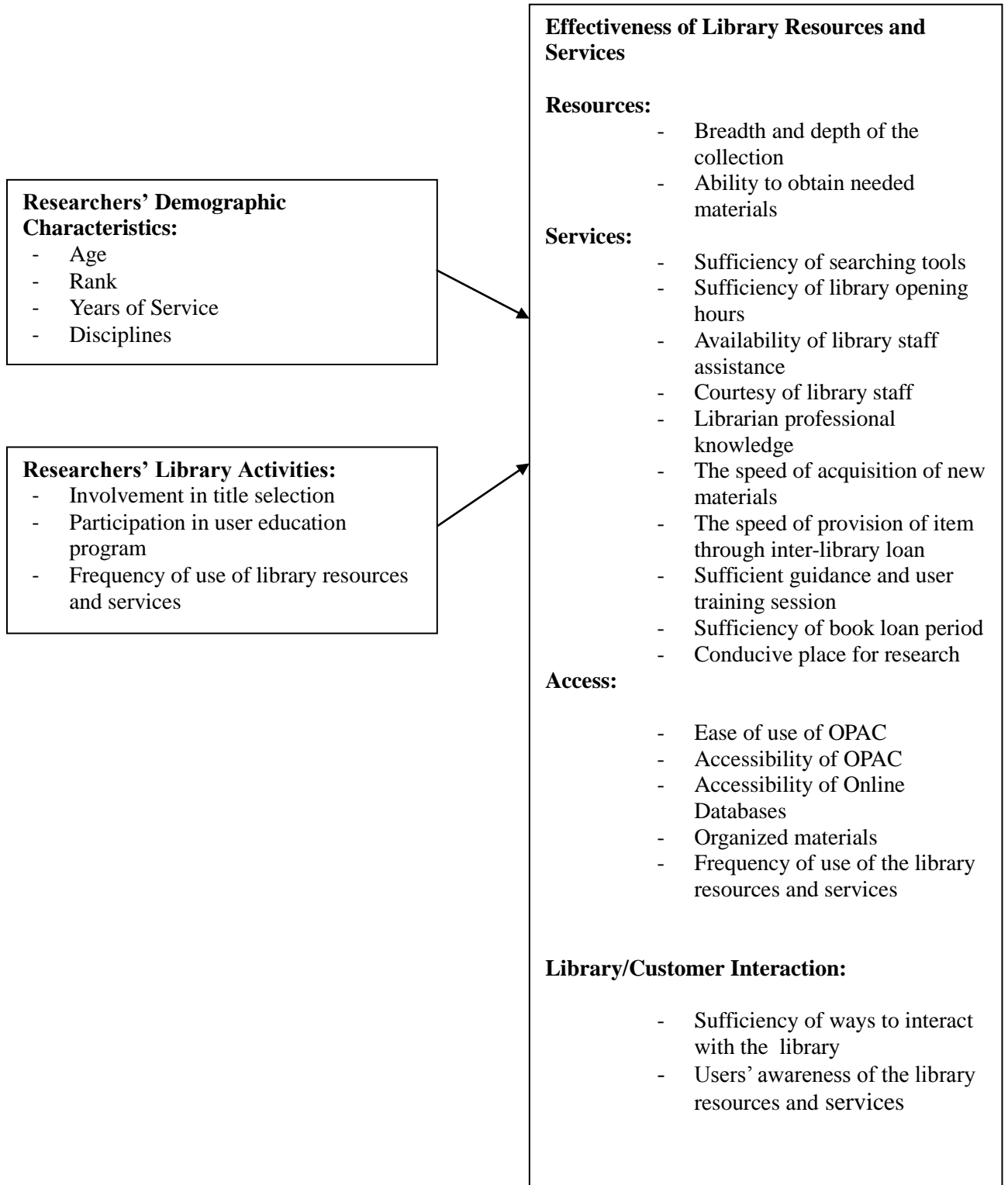


Figure 2 Framework of the study

## RESULT AND DISCUSSION

Self administrated questionnaire was used as the instrument for this study. Researchers from seventeen schools (faculties) in the main campus of Universiti Sains Malaysia were the respondents for this study. They were randomly selected based on three criteria below:

1. Published at least one article in any journal in 2009 or
2. Published a book in 2009 or
3. Received research grant from the university in 2009

1 to 5 Likert scales were used in the questionnaire. For the statement on the effectiveness of library services 1 indicated "strongly disagree" and 5 "strongly agree". For the statement on the usage level of library resources and services 1 indicated "never use" and 5 indicated "always use". The questionnaire was sent to 220 researchers and 108 of them responded. Table 1 shows the demographic characteristics of the respondents.

Table 1 Respondents' demographic characteristic

<b>Variables</b>	<b>Categories</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Gender</b>	Male	75	69.4
	Female	33	30.6
<b>Age</b>	25-35	10	9.3
	36-45	46	42.6
	46-55	37	34.3
	More than 56	15	13.9
<b>Years of service</b>	1-5	17	15.7
	6-10	23	22.3
	11-15	20	18.5
	16-20	16	14.8
	More than 20	32	29.6
<b>Rank</b>	Professor	23	21.3
	Assoc. Prof.	41	38.0
	Senior Lecturer	44	40.7
<b>Disciplines</b>	Arts and Humanities	12	11.1
	Social Sciences	37	34.3
	Sciences	59	54.6

## Adequacy of Library Resources

The adequacy of library resources was assessed based on researchers' opinion of the statements regarding the adequacy of books, journals and abstracts collection. Adequacy of collections is important for the library in supporting research activities in the university since it is the criteria in measuring the productivity of a university (Fairweather, 1999). Books, journals and abstracts were the major information sources used by researchers (RIN, 2007). It was found that the adequacy of library collection was closely linked to the users' perception of library effectiveness (Majid, Anwar and Eisenschitz, 2000).

All the criteria measured recorded less than half of respondents agreeing that there were sufficient library resources. Less than half of the respondents also felt that the library fulfilled their needs for materials. With the recorded means ranging from 2.94 to 3.26, we can further say that the library resources provided was fairly adequate in supporting researchers' information needs.

Table 2 Effectiveness of library based on adequacy of resources

Criteria	Mean	SD.
Adequacy of Books	3.26	1.22
Adequacy of Journals	3.18	1.25
Adequacy of Abstracts	3.07	1.21
Ability to obtain	2.94	1.17

## Service

Table 3 shows responses to the eleven criteria used to assess the effectiveness of library services. More than fifty percent of respondent agreed with eight of the eleven statements on the criteria for effectiveness of library services. Less than fifty percent agreed with the statement on effectiveness of library services which are; efficiency of new books process; efficiency of new journals process and Inter Library Loan service. The means ranged from the 3.62 (highest) to 2.83 (lowest).

Table 3 Effectiveness of library based on services

Criteria	Mean	SD.
Sufficient guidance	3.62	0.84
Library opening hours	3.58	0.96
Conducive place	3.52	0.98
Library staff- courtesy	3.49	0.95
Library staff -availability	3.49	1.01
Sufficient tools	3.48	0.86
Book loan Period	3.42	0.99
Librarian's professional knowledge	3.41	0.88
Efficiently process new book	3.17	1.05
Efficiently process new journal	3.12	1.03
ILL - promptly	2.83	0.90

Although studies on information needs of researchers have emphasized the importance of ILL, however this study found that the ILL recorded the lowest mean on the effectiveness of this service. As

Webb, Gannon-Leary and Bent (2007) stated, with easy access to online information resources users have options to order the full text themselves without requesting through the library. Thereby causing the decline in document delivery in libraries. Cox (2006) also reported that despite decline in transaction respondents of CONUL National Research Support Survey considered the interlibrary loan service still important. However, what was needed was faster transaction which could be achieved through online requesting and delivery.

In today's environment, the online discovery (searching) tools make it possible for researcher to uncover "hidden documents" which had never been indexed in printed tools before. Therefore gaps between finding and gaining access to resources are increasingly encountered. In such a situation, they will use the library's document supply service which most of the time fail to fulfill their needs (RIN and CURL, 2007).

### Access

As a domain used to assess the effectiveness of library services, this study identified five criteria for the assessment. However, the fifth criteria had to be measured separately because it had a different Likert scale measurement due to the nature of information which to be extracted (Table 5 & 6). Differing from the other domains, this domain show higher percentage of respondents agreeing with the statements within this criteria. "The online databases are easily accessible through the library website" recorded highest of agreement. The means for the first four criteria for this domain ranged from 3.56 to 3.96 (Table 4).

Accessibility of the library resources and services play an important role in ensuring the effectiveness of the library. To succeed in the current information environment, libraries must make sure that the adequacy of library resources which used to be measured through the size of the collection is balanced with its accessibility. (Dougherty, 1991).

Table 4 Effectiveness of library based on accessibility of the resources and services

Criteria	Mean	SD.
Accessibility of subscribed databases	3.96	0.79
Accessibility of OPAC	3.87	0.85
OPAC easily understood	3.76	0.78
Organized Materials	3.56	0.82

The fifth criterion used to assess the access domain was the frequency of use of library resources and services. Table 5 and Table 6 show the frequency of use of library resources and services by researchers.

Among the highest mean for listed resources in Table 5 was e-journals followed by abstracts, e-books, printed books, current printed journals and old printed journals. Table 5 strongly supported the highest mean in Table 4 criteria (accessibility of subscribed databases) thus reflecting that good access to library resources resulted in the high frequency of use of the resources. Differences in frequency were also shown in the result which reflects that use of electronic resources was more than printed resources.

As for use of library services the means was much lower (Table 6) as compared to use of resources. Amongst the services, the use of OPAC rated the highest. The three least used were Inter Library Loan, emails from liaison librarian and EndNote manuscript template. The means ranged from 1.87 to 3.18.

Table 5 Researchers' frequency of use of library resources

Criteria	Mean	SD.
e-Journals	4.10	1.18
Abstracts	3.65	1.28
e-Books	3.04	1.45
Printed Books	3.04	1.11
Current Printed Journals	2.96	1.32
Old Printed Journals	2.67	1.25

Table 6 Researchers' frequency of use of library services

Criteria	Mean	SD.
OPAC	3.18	1.29
Book Loan	2.72	1.27
Access Databases from Outside	2.48	1.33
A-Z Journals Locator	2.46	1.35
Electronic Alert	2.25	1.34
New Books Request	2.21	1.17
Reference Service	2.14	1.06
New Journals Request	2.18	1.18
Reserving Books Online	2.09	1.07
Renewing Books Online	2.07	1.15
Library as a Space	2.06	1.13
EndNote for Managing References	2.04	1.22
Photocopying Services	1.97	1.10
ILL	1.96	0.93
Emails from Liaison Librarian	1.87	1.02
EndNote Manuscript Template	1.87	1.10

### Library and Customer Interaction

There were two criteria used to assess the effectiveness of library for measuring interaction as a domain. The two criteria identified in this domain were sufficient ways to interact (Table 7) and researchers awareness of library resources and services (Table 8 & 9)

Table 7 The effectiveness of library based on library/customer interaction

Criteria	Mean	SD.
Sufficient ways to interact	3.56	0.87

Webb, Gannon-Leary and Bent (2007) stated that libraries have to continuously keep in touch with the research community in order to know what they really want from the library. The contact may in the form of enquiry support, virtual presence in online environments or personal contact. Libraries need to move away from a passive, reactive role to a more active one in order to anticipate as well as respond to demands from researchers. There is the silent majority that the library needs to reach, that is the 'nice customers' who never complain to the organization but complain to friends. This group undermines the



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services of the library when dissatisfied. Out of dissatisfaction with the library, they abandon it completely.

By keeping in touch, libraries may understand all variations in learning and in research practice that occur in the research community. This helps librarians to ensure that they are providing a range of resources to meet these different needs and also to understand that people will choose to use different resources in different ways. Libraries cannot provide a 'one size fits all' library and expect it to be successful; effective services rest on knowledge and empathy (Webb, Gannon-Leary and Bent, 2007).

Befriending and developing a personal connection with researchers is claimed to be a very important "service" that librarians can provide. Developing this type of relationships help researchers overcome barriers such as feeling embarrassed that they are ignorant on how to use the library. They will feel comfortable if they are able to express their feeling to libraries and seek help. They would have avoided the library if this type of relationship did not exist. This statement should serve as a warning about constant push in libraries to offer online, distance and electronic services. These modes of service will never replace personalized human service (Weber and Flatley, 2006).

Cox (2006) reported that almost a third of respondents in the survey contacted nobody regarding inquiries for information related to their research. Despite easier access to online information which likely contributed to the increase of self service, this report suggested that there is also a need for libraries to ensure maximum visibility of, and easy access to, library staff support in person and online. This study also reported that there is a need for libraries to maximize the effectiveness of library websites as portals to well organized and easily navigable collection of online information resources.

Libraries with liaison program seems to be one of the best answer to solve communication problems between library and researchers. A study by Yang (2000) reported that researchers in Texas A&M University had a better view of the library since the implementation of the liaison program. This study also stated that updating the researchers on services available and ordering books or serials are considered the primary services that the liaison should perform for researchers.

Another criterion in assessing the effectiveness of library/customer interaction was the percentage of awareness of library resources and services. Table 8 and Table 9 show the percentage of researchers who are aware of library resources and services. Awareness of library resources was higher as compared to awareness of library services.

There were seven services which had less than 90% of respondents who were aware of the services. Most of them were new services such as bibliographic management software (EndNote), A-Z journals locator, electronics alerts from subscribed databases and emails from the liaison librarian except for new book and journal requests.

Table 8 Researchers' awareness of library resources

<b>Resources</b>	<b>Awareness (%)</b>
Printed Books	99.1
e-Journals	99.1
Abstracts	98.1
Current Printed Journals	97.2
Old Printed Journals	97.2
e-Books	95.3

Table 9 Researchers' awareness of library services

Services	%
Book Loan	98.1
OPAC	98.1
ILL	96.3
Reference Service	95.3
Library as a Space	93.5
Photocopying Services	91.7
Access Databases from Outside	91.7
Renewing Books Online	91.7
Reserving Books Online	90.7
EndNote for Managing References	86.1
New Books Request	84.3
New Journals Request	83.3
A-Z Journals Locator	83.3
EndNote Manuscript Template	82.4
Electronic Alert	77.8
Emails from Liaison Librarian	76.9

The level of awareness of library resources and services can be used as an indicator of the effectiveness of strategies used by the libraries in publicizing their services. The lower awareness of some new library services might be the result of lack of publicities from the library.

A study related to the use of library resources and services by faculties in University of Iowa User Needs Assessment Group (2002) revealed that faculties underutilized libraries' resources and services simply because they were not aware of the existence. Jankowska (2004) reported the result of the survey clearly confirmed previous findings about the fact that unawareness of the range of databases and the lack of knowledge on electronic resources were among critical obstacles to effective use of electronic resources and services by the researchers.

Roberts (1995) in her study found that researchers were aware of only 47 per cent of library services, and they were least aware of those services which required direct communication from librarians. Popoola (2008) who did a study in South-West Nigeria universities reported that faculty awareness of available library information products and services had positive relationship with the frequency of use, consultation with the librarians, faculty status and membership of library related committees. It shows the importance of communication links between librarians and the users.

#### ANALYSIS OF RELATIONSHIP

In the analysis of relationship Spearman's Rho and Pearson Correlation Coefficient were used to determine the degree and directions of relatedness between dependent and independent variables.

Table 10 shows that the demographic characteristics such as age, rank and years of service of researchers did not relate to their perceived effectiveness of library resources and services. This is in conflict with Davis and Bentley (1979) statement that the shorter the period of services, the greater the tendency to be critical of library services. Their survey of faculty members from three academic institutions showed that institutional affiliation, academic rank, and length of time with the institution affected their perceptions and use of libraries. They stated that longer periods of library use will increase researchers' familiarity with the library.

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Technology has eased the use of searching tools such as the web OPAC and subscribed databases. Whereby, users can easily master the information searching skill. This is much easier than the traditional way of searching which is time consuming because all were dependent on printed tools (card catalogs, indexes and abstracts). As a result, gaps between researchers based on their demographic characteristics has been eliminated because technology has made it possible for them to be equally competent.

However, a weak relationship between researchers' disciplines and their perceived effectiveness of library resources in this study supported Davis and Bentley (1979) and RIN (2007) who stated that there is a difference in ability of libraries in fulfilling the demands of researchers from different disciplines.

Table 10 Spearman's rho correlation between perceived effectiveness of library resources and services and demographic characteristics

		Perceived effectiveness of library resources	Perceived effectiveness of library services
Age	Correlation Coefficient	.108	.174
	Sig. (2-tailed)	.267	.076
Rank	Correlation Coefficient	.028	.027
	Sig. (2-tailed)	.775	.783
Years of service	Correlation Coefficient	.143	.140
	Sig. (2-tailed)	.140	.153
Discipline	Correlation Coefficient	.224*	.085
	Sig. (2-tailed)	.020	.386

N=108     \*. Correlation is significant at the 0.05 level (2-tailed).

In Table 11 and Table 12, the study show significant relationships between researchers' library activities and their perceived effectiveness of library resources and services. Such activities were new titles requests, user education programs and the frequency of use of library resources and services.

These results support the findings of Majid, Anwar and Eisenschitz (2001) whereby they stated that the involvement of library users in the selection of library materials is likely to result in developing library collections that are more relevant to their information needs. They further added that consultations by the library in seeking researchers opinion on selection of library materials could also create a feeling of being involved, thus, leading to enhanced perception of library effectiveness. In identifying factors, Majid, Anwar and Eisenschitz (2001) reported that there was relationship between participation in user education program and perception of library effectiveness.

Table 11 Spearman's rho correlation between perceived effectiveness of library resources and services and library related characteristics

		Perceived effectiveness of library resources	perceived effectiveness of library services
Use of new book request	Correlation Coefficient	.338**	.427**
	Sig. (2-tailed)	.000	.000
Use of new journal request	Correlation Coefficient	.291**	.439**
	Sig. (2-tailed)	.002	.000
Participation in user education program	Correlation Coefficient	.054	.292**
	Sig. (2-tailed)	.587	.03

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 12 Pearson correlation between perceived effectiveness of library resources and services and frequency of use of library resources and services

		Perceived effectiveness of library resources	perceived effectiveness of library services
Frequency of use of library resources	Pearson Correlation	.351**	.317**
	Sig. (2-tailed)	.000	.001
Frequency of use of library services	Pearson Correlation	.211*	.420**
	Sig. (2-tailed)	.029	.000

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## CONCLUSION

Assessment of library effectiveness is important to all libraries especially in today's changing environment and technological applications. As such, the effectiveness of library resources and services can be assessed to see how such technologies affect them. The high scores recorded in the domain of access to online resources (OPAC and subscribed databases) reflect how the advancement of technology has helped the library in improving its services.

Among the four domains identified for assessment, library resources was found to be fairly adequately provided. In the domain of services the study found that new acquisitions and ILL service need to be improved. Finally, in assessing researchers interaction with the library, this study sought to investigate how far that interaction was able to bring about awareness of library resources and services. The low level of awareness of some services demonstrated that improvement is needed in the way library publicized its services.

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Results from the analysis of relationship proved that demographic characteristics of users (age, rank and years of service) did not relate to their perceived effectiveness of library resources and services. However, there was a significant relationship between researchers' discipline and perceived effectiveness of library resources. In the case of researchers library activities (new titles request of journals and books, participation in user education program, use of library resources and services), there were significant relationships with their perceived effectiveness of library resources and services. These mentioned and measured activities have always been reported as the library's outputs which have stayed to be mere output reports. In maximizing on these outputs, the library should use these reports as indicators for the betterment and more effective provision of library resources and services.

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