A study of the information seeking behavior of undergraduate students of Makerere University, Uganda

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Abstract: *The study investigated the information needs and seeking behavior of undergraduate students of Makerere University. A cross–sectional survey was carried out, with samples of respondents from the Department of Biochemistry in the Faculty of Science and the Department of History in the Faculty of Arts. The sample consisted of 104 undergraduate students selected from their first, second, and third year of study. Ellis' six generic information–seeking activities were tested to establish how undergraduate students seek information. The chi–square statistic was used to test the stated hypotheses. The results provide an insight into the factors that influence students information–seeking behavior and the information sources used. The study makes recommendations that could lead to the improvement of students' information seeking behavior and use of information resources.*

Background

Information seeking is a basic activity indulged in by all people and manifested through a particular behavior. It is also an aspect of scholarly work of most interest to academic librarians who strive to develop collections, services, and organizational structures that facilitate information seeking (Wiberley, 1989:638). Mann (1993) notes that most researchers, even with computers, find only a fraction of the sources available to them. He explains that researchers tend to work within one or another mental framework that limits their basic perception of the universe of knowledge available to them. Students according to him use a subject–disciplinary method that leads them to a specific list of sources on a particular subject. He points out that while this method allows students and researchers to find more specific sources, it is limiting in that they may not realize that work of interest to their own subject appears within the literature of many other disciplines. This impinges on how much they get out of the library system.

Studies conducted among undergraduate students have shown that most of them are inadequate in using libraries. Zondi (1992:204) for instance conducted a study among first year undergraduate students at the University of Zululand, South Africa. She established that the majority of students showed a very low level of competence in the use of a library and displayed poor information seeking patterns. Kamanda (1999:44) did a similar study at the East African School of Library and Information Science Library, Makerere University, Uganda. He observed that more than half of the students experience problems in locating library information materials. He noted that the majority of them either located materials through browsing the shelves or sought assistance from library staff, but they did not make full use of the card catalogue. Ssendikadiwa (1996:42) also observed about Makerere University that

although the catalogue was the most essential library tool in accessing library collections, it was the most avoided and least consulted by undergraduates. Considering the rapid changes in information provision in the 21st Century with computerized access, digitized information formats, and the plethora of resources on the Internet, the access and retrieval capabilities of users who are traditionally accustomed to manual information library systems is questionable. Atkinson (1997:60) enumerates these as the circumstances under which it was worthwhile to re–examine issues of user behavior in academic settings. This study is one small contribution to that end. It seeks to investigate the process undergraduate students use while seeking information, with Ellis' model as the backbone of the hypotheses to be tested. Ellis' model describes the information seeking activities that a scholar may indulge in, not categorically as steps, but as a set, taken together to explain the components of the information seeking patterns.

Statement of the problem

Undergraduate students in Makerere University are expected to maximally utilise the University Library as one of their major sources of information. However, noting from observation and from the studies conducted on library use in this University it was established that students do not use most of the library information resources. It was assumed that students could be experiencing technical problems in accessing information resources; coupled with lack of knowledge and awareness of the resources. The students' poor information seeking behaviour was singled out as the biggest cause that needed investigation.

Purpose of the study

Library information resources are expensive. The librarians needed to manage these resources and make them accessible are also costly in terms of recruitment, and retention. To attain cost effectiveness in the university library services and promote the use of library information resources, this study sought to establish ways of improving the information–seeking behaviour of undergraduate students. Ellis' six generic information–seeking activities were used as a basis of establishing how undergraduate students seek information. To attain that goal, the study stipulated the following objectives:

1. To establish the undergraduate students' information needs;
2. To determine the undergraduate students' information seeking behaviour;
3. To establish the problems that undergraduate students encounter in information seeking; and,
4. To suggest strategies of improving undergraduate students' information seeking behaviour.

Hypotheses

The study was predominantly quantitative, with the following two hypotheses tested to establish the information "search strategies" and "seeking problems" that students face.

1. Makerere University undergraduate students' search strategies were not the same as Ellis' six characteristic information–seeking activities.
2. Makerere University undergraduate students' information seeking problems were not as a result of the procedural set up of the information institution — the library.

Literature review

Information seeking

Information seeking is undertaken to identify a message that satisfies a perceived need (Wright and Guy, 1997). This activity may be actively or passively done when taking steps to satisfy a felt need (Ikoja–Odongo, 2002). On the other hand, Andersen (2000) noted that research on information seeking has looked at how individuals go about finding the materials that they need in order to satisfy information needs. It was therefore noted on this basis that a number of models had been developed in this respect like Ellis' 1993 model, Eisenberg and Berkowitz's 1992 model, and Kuhlthau's 1992 model. These models have been applied in a number of instances to follow up the patterns used in seeking information or to explain how information could be sought systematically.

Information seeking behaviour

Information seeking behavior refers to the way people search for and utilize information (Fairer–Wessels, 1990:361). Most times students information seeking behavior involves active or purposeful information seeking as a result of the need to complete course assignments, prepare for class discussions, seminars, workshops, conferences, or write final year research papers. Fister (1992:168) noted that undergraduate students are smart people, but find the university library to be a threatening place and find the process of research intimidating. Unfortunately they do not learn the basic information skills. They end up using trial and error methods of research that limits their capabilities to satisfy their needs. Wilson's 1996 model notes that in the process of seeking information, problems are encountered. Taylor (1990) noted that after interacting with the information sources (like in a library), what a user actually needs may not tally with what is practically available, due to constraints either within the stock or due to the users own inability. Mellon (1986) noted that undergraduates encounter barriers like library anxiety. User's perceptions of the library and its programs also act as an intervening variable to information utilisation in the library.

Improving information seeking strategies

Finding ways of intercepting the barriers to information seeking is one of the solutions to improving the students' information seeking behaviour. Bearing in mind that contact with students in information institutions is either through reference interviews or bibliographic instruction sessions, Martin and Metcalfe (2001) acknowledged that modes of informing are specific to each persons concern, as are the topics they want to be informed about. Both note that libraries in the past sought to accommodate this need by promoting current awareness services (CAS) and selective dissemination of information (SDI), either through print or electronic means. These are user outreach avenues that can still be optimally utilized in addition to customizing access points in accordance with user interests using Internet or the university intranet. Fister (1992:163–164) in analyzing and comparing the bibliographic instruction research processes taught to students and the approaches that students used in seeking information noted that students should not be left to flounder on their own. Library skills should be put in context of the research process. Callison (1997:355) recommends increased efforts to expand instruction beyond the one–time lesson in introducing students to

the library. Lau (2001) observed that although librarians had assumed the role of user information educators, their work tended to occur in isolation. Teamwork was needed to make library instruction part of the learning process. The publicity services provided in an information institution play a big role in influencing how its resources are utilized and how the users seek for information.

Methodology

Study design

This study was largely quantitative, because of the need to test Ellis' model of the six characteristic information–seeking activities. The chi–square statistic was selected to test the study hypotheses as the most appropriate measure of association between the variables. The study was conducted at Makerere University Main Campus where the majority of undergraduate students attend courses. This study utilized a cross sectional perspective, by considering all the three levels of study (First, Second and Third years) in two Departments, namely Biochemistry in the Faculty of Science and History in the Faculty of Arts during the year 2002/2003. These samples were selected because they had the library physical requirements, with qualified librarians manning them. The study was confined to establishing the students' information needs, their information seeking behaviour and the problems they encounter in seeking information. With an undergraduate student population of 30,226 students (Makerere University 2001–2002 Students' Nominal Roll), a representative study population of 1,864 and a sample of 115 undergraduate students derived from the selected study faculties were used. This sample was derived using the proportion of the study population to the total undergraduate student population in the 2001–2002 academic year, (*i.e.* 1,864 : 30,226) which yielded a percentage of 6.17. Proportions were used to arrive at the sample size because the quota sampling techniques were used in this study. The same proportion (*i.e.* 6.17%) was used to derive the sample strata according to the students' year of study. The number in each stratum (*i.e.* each quota) was derived using Walpole's formula for proportions (Walpole 1982):

i.e. $n_i = (N_i / N) n$
Where: n_i represents Quota size required,
N_i represents Number of students in each stratum
N represents Total study population,
n represents Total sample size used.

Table 1: Computed sample of students by year of study from the study population.

	Faculty/Program		
	Bachelor of Arts	Bachelor of Science	Total
First year (Population)	726	271	997
First year (Sample)	[726/1176] X 73 = 45	[271/688] X 42 = 16	61
Second year (Population)	256	193	449

Second year (Sample)	[256/1176] X 73 = 16	[193/688] X 42 = 12	28
Third year (Population)	194	224	418
Third year (Sample)	[194/1176] X 73 = 12	[224/688] X 42 = 14	26
Total Population	1176	688	1864
Total Sample	[1176/1864] X 115 = 73	[688/1864] X 115 = 42	115

Methods

Non–probabilistic quota sampling techniques were applied to select the student respondents, while purposive sampling was used in selecting the academic staff respondents. The questionnaire, interview and observation methods were used in this study, with self–administered and hand delivered questionnaires distributed to the student respondents. Semi–structured in–depth face–to–face interviews were used to collect data from the key informants purposively selected from staff members who interact with undergraduate students in their information seeking endeavors. A total of six lecturers who lecture in all the three years of study in each of the selected departments were purposively selected and interviewed, (three from each of the faculties of Arts and Science). A total of 12 librarians, 10 from the university library and two from the Departmental/Faculty libraries (one from each of the two faculties of Arts and Science) were purposively selected and interviewed. A librarian with established section responsibilities was selected from at least each of the University Library sections/divisions.

Direct observation of the students, yielding careful identification and accurate description of the students' information seeking processes was done in the University library. Observation focused at particular points in the University library where students interact with the library system and staff. Mann (1990:50) notes that any library is a social setting where people's behaviour is, for the most part, reasonably open to view. Therefore sampling a few entrants, it was possible to record systematically what the students did first when they got to the library, noting "… whether they seem purposive in their book selection or whether they appear to be browsing rather aimlessly..." as quoted by (Mann, 1990:50). The specified locations where observation was done include the catalogue area, the issue/reference section, the information desk, the open shelves areas, and the service windows.

Research procedure

A total of 120 questionnaires were distributed to the undergraduate students, putting into consideration a non–response rate of 5. Out of the 120 questionnaires issued out, 108 were returned. Four, (4) of the returned questionnaires were rejected because they were not satisfactorily filled. Only 104 questionnaires (90.4%) were used for analysis. The breakdown of participation is shown in Table 2.

Table 2: Sampled/Planned and Obtained/Actual number of undergraduate student respondents.

		Faculty/Program				Total	
		Arts		Science			
		Planned	Actual	Planned	Actual	Planned	Actual
Year of study	First Year	45	40	16	15	61	55
	Second Year	16	17	12	10	28	27
	Third Year	12	14	14	8	26	22
Total		73	71	42	33	115	104

Results

Undergraduate students information needs

The findings revealed that the main information demands that led undergraduate students into seeking for information include: course works and assignments (86), preparation for examinations and tests (68), general reading to enhance lecture notes (55), and class–group discussions (44). Seminars or preparation for workshops (10), tutorial presentations (15) and dissertation research (15) all had a lower rating.

Information sources

To establish what information institutions the students preferred using most and how much they valued them, they were asked to select and rank each information source. The findings show that lecture notes and handouts were the most preferred and used, followed by using departmental Book–Banks and then the University Library. Consulting and photocopying from colleagues took the fourth position, followed by using Internet sources, while the University Bookshop took the last position. Considering the nature and range of information resources in each of the sources used, the University Library was noted as the only well–established institutional information source with varied information resources for further investigation. These resources were therefore categorized by type, and the respondents asked to select what they frequently used. The findings revealed that textbooks were the most heavily used with a rating of 101 (97.1%) respondents. The rest had frequencies below average (52), with Theses/Dissertations, Reference materials, Newspapers, and the Internet having frequencies between 21 and 30 respondents. CD–ROMs, online databases, Conference Literature Proceedings, and Print Journals were the least used information resources with frequencies ranging between 1 and 15 respondents.

Library usage

Because students visit the University Library with different objectives, undergraduate students were asked to identify and rank the activities that occupied them most while using the library. The findings revealed that the majority of the respondents (65) ranked utilising library books first, followed by those who use it as a quiet study space to read their books, then those who borrow library materials and those who seek assistance and do photocopying where necessary.

Undergraduate students' information seeking behavior

"To determine the undergraduate students' information seeking behavior", a hypothesis was stated and tested using Ellis' model as follows: The First Research Hypothesis (H_1) and the Null Hypothesis (H_{01}) stated that:

H_1: "Makerere University undergraduate students' search strategies are not the same as Ellis' six characteristic information seeking activities"
H_{01}: "It is statistically significant that Makerere University undergraduate students search strategies are the same as Ellis' six characteristic information seeking activities"

In the null hypothesis, it was assumed that undergraduate students follow Ellis' six characteristic information–seeking behaviours as their information search strategies.

The variables identified in this hypothesis were:

1. The "Search strategies", which defined how students approach their information needs.
2.
3. "Ellis' six characteristic information seeking activities", identified as starting, chaining, browsing, differentiating, monitoring, and extracting.

The purpose of this hypothesis was to establish how undergraduate students seek information. Ellis' six characteristic information–seeking activities, established on academic researchers, were the independent variables on which the students search strategies (the dependent variable, measured by the students 'yes' or 'no' response) were observed in this study. The essence of the relationship was to establish whether the undergraduate students follow Ellis' activities when seeking information. If yes, the null hypothesis was accepted, otherwise it was rejected. Each of the six characteristic activities: starting, chaining, browsing, monitoring, differentiating, and extracting were tested individually using the chi–square statistic. A number of questions were set to collect data on these variables; which were tested for majority use ('yes' response) or non–use ('no' response) of each technique. The findings and chi–square computations were summarized, tabulated and discussed as follows:

Testing the students' BROWSING and CHAINING techniques

Table 3: Chi–square values for "Browsing" and "Chaining" techniques.

	Browsing and Chaining techniques						
	Frequencies				Chi–square test statistics		
	Yes		No				
	Observed	Expected	Observed	Expected	χ^2_{ob}	df	χ^2_{cv} at 0.05 level
Browsing	60	45.0	30	45.0	10.000	1	3.84

Chaining	84	49.0	14	49.0	50.000	1	3.84

Note: χ^2_{ob} represents the obtained/calculated chi–square value

χ^2_{cv} represents the critical chi–square value obtained from chi–square tables
df. represent the degrees of freedom calculated as:
(n — 1) in an n X 1 contingence table [n = rows or columns]
(R — 1) (C — 1) in an n X m contingence table [n = rows (R), m = columns (M)]

χ^2_{ob} is calculated as follows:

$$\chi^2_{ob} = \sum_{i=1}^{n} \frac{(o_i - e_i)^2}{e_i}$$

Where: i = 1, 2, ... n
o_i is the obtained frequency
e_i is the expected frequency calculated as:
e_i = (Total items observed/number of items) *E.g.* (Total for 'yes' and 'no' observed/2)

In Table 3, an obtained chi–square value is statistically significant if it is greater than or equal to 3.84, at a significance level of 0.05, with 1 degree of freedom. The obtained chi–square statistic for browsing (10.000), and chaining (50.000) both indicated a high significance level, with the null hypothesis accepted. Thus, browsing and chaining were concluded to be among the undergraduate students' information seeking search strategies.

Testing the students' STARTING techniques

Starting techniques signify where the initial search for the relevant documents is first done after identifying an information need. The various options suggested to the students for selection according to what they used are as explained below and shown in Table 4 namely; using recommended reading lists; searching through the subject catalogue; inquiring directly from lecturers; inquiring from colleagues; searching directly on the shelves; searching through e–resources; and searching through the journal contents to identify relevant articles, and browsing the Internet.

Table 4: Chi–square values for "Starting" search techniques.

Starting techniques							
	Frequencies				Chi–square test statistics		
	Yes		No		χ^2_{ob}	df	χ^2_{cv} at 0.05 level
	Observed	Expected	Observed	Expected			

Reading lists	59	51.5	44	51.5	2.184	1	3.84
Subject catalogue	53	51.5	50	51.5	0.087	1	3.84
Lecturers	65	51.5	38	51.5	7.078	1	3.84
Colleagues	58	51.5	45	51.5	1.641	1	3.84
Shelves	41	51.5	62	51.5	4.282	1	3.84
E–resources	7	51.5	96	51.5	76.903	1	3.84
Journal contents	3	51.0	99	51.0	90.353	1	3.84
Browse Internet	16	51.5	87	51.5	48.942	1	3.84

From Table 4, the chi–square values that were statistically significant at the 0.05 level, with 1 degree of freedom for starting techniques were: lecturers with 7.078 > 3.84; shelves with 4.282 > 3.84; E–resources with 76.903 > 3.84; journal contents with 90.353 > 3.84; and browsing the Internet with 48.942 > 3.84. These implied that the deviations between the observed and expected frequencies were high though not on the same side of the 'yes' or 'no' response. The lecturers fall on the 'yes' side while the rest fall on the 'no' side. Therefore, it was noted that using lecturers was the only statistically significant starting option used by undergraduate students, whereas shelves, e–resources, journal contents and browsing the Internet were significantly not used by the students as starting points.

Examining those that were not statistically significant, (*i.e.* Reading lists with 2.184 < 3.84, Colleagues: 1.641 < 3.84, Subject catalogue: 0.087 < 3.84) revealed that the deviations between the observed and the expected frequencies were quite small; and using the eyeball test (visual inspection), the 'yes' response was higher. To some extent therefore, reading lists, colleagues and the subject catalogue were used as starting techniques but not at probabilities high enough to accept the null hypothesis.

Testing the students' DIFFERENTIATING techniques

To differentiate between the many documents identified by a user and select what is appropriate for use to satisfy an identified need; three options were suggested for the respondents to select what they used. These are described in the statements below:

1. Comparing the **titles** of documents related to a need and selecting.
2. Critically looking at **contents** of each document before deciding on which one to use.
3. Critically searching the **index** of each document to identify whether what is required is actually in a particular document before it is selected for use.

These were all subjected to a chi–square test, with a probability level of 0.05, and 1 degree of freedom to establish whether the majority of the students used them or not. The findings are

as shown in Table 5.

Table 5: Chi–square values for "Differentiating" search techniques.

	Differentiating techniques						
	Frequencies				Chi–square test statistics		
	Yes		No		χ^2_{ob}	df	χ^2_{cv} at 0.05 level
	Observed	Expected	Observed	Expected			
Titles	42	49.5	57	49.5	2.273	1	3.84
Contents	68	49.5	31	49.5	13.828	1	3.84
Book index	46	49.5	53	49.5	0.495	1	3.84

From Table 5, an obtained chi–square value is statistically significant if it is greater than or equal to the chi–square critical value of 3.84. It was therefore found that inspecting through the contents of information materials is the only statistically significant differentiating technique used by undergraduate students. On a general note, however, the differentiating technique is not practically accepted as an information searching technique because most times students do not find the actual documents that they would have preferred using and end up with any alternative available, provided it is relevant for the specified information need. Secondly, because the most used documents are in the closed access sections, the opportunity of using more than one document to compare the contents is limited. These differentiating techniques are therefore not so dictating for what a student actually uses in the end. On most occasions students concentrate on using particular materials recommended by either their lecturers or colleagues who have used them before; other than searching to find the most appropriate document to use. On this basis, the null hypothesis was therefore rejected that differentiating is not one of the major searching strategies used by undergraduate students.

Testing the students' EXTRACTING techniques

To extract material of interest for specified information needs, undergraduate students either approach the information resource directly on the shelves or they first use the various retrieval tools before selecting what is relevant. Table 6 shows the chi–square values on how undergraduate students utilize the information retrieval tools to extract information. Considering the obtained chi–square statistics in Table 6, all of them were highly statistically significant except for bibliographies where the computed chi–square value was less than the critical chi–square value (*i.e.* 1.222 < 3.84). For the card catalogue, periodical indexes, journal contents, CD–ROM indexes, e–resources and the Internet, the computed chi–square values were all greater than the critical chi–square value of 3.84 at a significant level of 0.05 with 1 degree of freedom. This implied that the deviations between the observed and the expected

frequencies were high but with only the card catalogue being significant on the use side ('yes' response). The rest fall on the non–use side ('no' response). The null hypothesis was therefore only accepted for the card catalogue, as an extracting technique used by undergraduate students.

Table 6: Chi–square values for "Extracting" search techniques.

Extracting techniques							
	Frequencies				Chi–square test statistics		
	Yes		No		χ^2_{ob}	df	χ^2_{cv} at 0.05 level
	Observed	Expected	Observed	Expected			
Card catalogue	83	49.5	16	49.5	45.343	1	3.84
Bibliographies	44	49.5	55	49.5	1.222	1	3.84
Periodical index	24	49.0	74	49.0	25.510	1	3.84
Journal contents	15	49.5	84	49.5	48.091	1	3.84
CD indexes	5	49.5	94	49.5	80.010	1	3.84
E–journals	9	49.5	90	49.5	66.273	1	3.84
Internet	20	49.5	79	49.5	35.162	1	3.84

Testing the students' MONITORING techniques

Monitoring as an information seeking procedure was subjected to a ranking scale of 1 to 7, with 1 as the highest rank and 7 as the lowest rank for each of the options set for the students to select from. The results showed very high variations in the students' choice for what they used most and what they used least. The chi–square test statistics showed very high significance levels for all the options, with either rank 1 or rank 7 taking the highest figure for each option, implying that the deviations were inclined at both rank 1 and rank 7. However, because of the scattered distribution of the frequencies, the results were re–grouped with the ranks combined to arrive at three groups classed as the highly used (ranks 1–2), moderately used (ranks 3–5), and the least used (ranks 6–7) as shown in Table 7.

Table 7: Chi–square values for "Monitoring" search techniques.

Monitoring techniques						
	Rank Frequencies			Chi−square test statistics		
Ranks	Ranks 1−2	Ranks 3−5	Ranks 6−7	df	X^2_{ob}	X^2_{cv} at 0.05 level
Catalogue (Observed) (Expected)	53 28.7	15 28.7	18 28.7	2	31.103	5.99
Lists (Observed) (Expected)	41 26.3	11 26.3	27 26.3	2	17.136	5.99
Displays (Observed) (Expected)	27 26.7	21 26.7	32 26.7	2	2.272	5.99
Library staff (Observed) (Expected)	30 27.3	23 27.3	29 27.3	2	1.050	5.99
Lecturers (Observed) (Expected)	34 27.7	28 27.7	21 27.7	2	3.057	5.99
Colleagues (Observed) (Expected)	43 28.0	29 28.0	12 28.0	2	17.214	5.99
Workshops (Observed) (Expected)	4 25.3	10 25.3	62 25.3	2	80.422	5.99

From Table 7, it is noted that at 0.05 significance level, with 2 degrees of freedom, the computed chi−square values for displays, library staff, and lecturers were less than the critical chi−square value and therefore not statistically significant. The null hypothesis was therefore rejected and the research hypothesis accepted that displays, library staff and lecturers are not the monitoring technique options used by undergraduate students. Table 7 also portrays the highly significant monitoring technique options (*i.e.* those with the computed chi−square value greater than the critical chi−square value) as: Catalogues (31.103 > 5.99); Lists (17.136 > 5.99); Colleagues (17.214 > 5.99) and Workshops (80.422 > 5.99). However, they all do not significantly fall on the highly used side (rank 1−2), to be accepted as monitoring techniques. Only the catalogue, lists and colleagues are significant with inclinations towards ranks 1−2. Therefore, the null hypothesis was only accepted for catalogues, lists, and colleagues as the monitoring technique options used by undergraduate students.

In general, the null hypothesis was therefore accepted that Makerere University undergraduate students follow only five of Ellis' six generic information−seeking activities. These are **Starting** (using lecturers and to some extent reading lists, colleagues and the card catalogue); **Browsing** (especially on the open shelves); **Chaining** (using references at the back of

consulted books); **Monitoring** (using the card catalogues, lists on library notice boards, and colleagues); and, **Extracting** (using the card catalogue).

Undergraduate students' information seeking problems

"To establish the problems that undergraduate students encountered in information seeking", a hypothesis was stated and analyzed as follows: The Second Research hypothesis (H_2) and Null Hypothesis (H_{02}) stated that:

H_2: "Makerere University undergraduate students' information seeking problems are not as a result of the procedural set up of the information institution — the library"
(H_{02}: "It is statistically significant that Makerere University undergraduate students' information seeking problems are as a result of the procedures of use in the Library"

It was therefore assumed in the null hypothesis that undergraduate students' information seeking problems are inclined to the library's procedures of use other than as a result of the students own difficulties of not knowing what to do or any other factors. The variables identified in this hypothesis were:

1. The "Library's procedures of use"
2. The "Information seeking difficulties" encountered by students

The purpose of this hypothesis was to establish the major problems that undergraduate students encountered while seeking information and on which side (the library or individual ignorance) they fell most in order to lay strategies on how they could be addressed. A number of questions were set to collect data on the two identified sides — the "Library" and "Individual ignorance" (here after referred to as "Institutional" and "Personal").

On the "Institutional side", the findings and Chi–square computations revealed the following: Lending information materials to students for use outside the University library is an institutional service rendered to those in need of borrowing. In Makerere University library, the information materials lent out are those that are on the open shelves, while all those in the closed sections are only used within the confines of the library. Analyzing the respondents' trend of responses to borrowing library materials using the chi–square test revealed no significant difference between those who borrow and those who do not borrow. That is, the obtained chi–square value was less than the critical chi–square value at the 0.05 significance level with 1 degree of freedom (0.038 < 3.84). By visual inspection, it was found that those who borrow are almost equal to those who do not borrow. Thus, having a high rate of none borrowers implied there are some problems with the institutional procedures of operation. The students' reasons for not borrowing were further assessed and the following registered as the major causes: the undergraduate students' arguments were that the closed access system does not give them chances to use textbooks outside the library and the books are too few for all the students to use; the procedures used are time consuming and too restrictive on how long a textbook should be used even within the library. It was noted that fear of losing the library materials and later pay lots of money, made undergraduate students prefer using the library materials within the library. Having less lent out to students was therefore regarded as an institutional focused problem. Since most of the respondents' reasons hinted on the closed access system, the question as to whether the closed access system prohibited them from accessing library materials was subjected to a chi–square test to establish its significance to

the students responses. The obtained chi–square value was noted to be greater than the critical chi–square value (*i.e.* 9.986 > 3.84). It was found to be statistically significant that the closed access system in the main library is one of the prohibiting factors limiting the students' maximum utilization of library resources. To investigate further on the factors that were assumed to be limiting the student's maximum utilization of the University Library, undergraduate students were also asked to comment on how current the information resources they often used in the university library were. It was established that the information resources that the students used were either current (with 37.5 percent) or old (with 52.4 percent). Very few students acknowledge using the very current information resources probably because they are too few; or the users were not aware of their existence; or lecturers have not referred them to those sources; or the students are just not adventurous in discovering what could be new in the library. The very old information resources were also less utilized (probably because they are not relevant; or the lecturers do not refer the students to use them; or they are over shadowed by the current information resources). Since the majority of the students acknowledged having access to mainly old information resources, this was also considered a substantial problem hindering the students from utilizing the library resources, thinking that the resources that are available are only old materials that may not be helpful.

There are instances where the library has played its part to ensure that library users are knowledgeable and capable of utilizing its resources independently. Some of the endeavors include conducting user education, ensuring that library staff are available for consultation and that the access tools are available for use. It also conducts some computer workshops to ensure that the students know how to access the e–resources though at a very low coverage. On the "Personal side", a number of questions were put forward to the undergraduate students to assess whether they utilized the training opportunities availed by the University Library to be able to optimally use the library resources, or whether there were any other factors that hindered them from attending these sessions. Undergraduate students were therefore asked whether they attended the user education workshops conducted during each of the students first year orientation week (beginning of semester one); 54.4 percent of the respondents said they had never attended any of these workshops. The dominating reasons being that the notification of these workshops was not adequately done. Sometimes workshops are conducted concurrently with other programs or during lecture times. One of the respondents said the workshops were not clear to them. But considering the student's response to whether user education was sufficient, 74.7 percent of them said it was sufficient enough. For the few who had ever attended the user education sessions (45.6 percent), and felt it needed some improvement, the following were recommended:

1. More frequent and short–term training workshops should be organized with few students so that all understand;
2. User knowledge provision should be changed from being general to being particular and practical;
3. The training sessions should be broken into sections so that not every thing is taught at once; and,
4. Other delivery methods should be used such that those who miss can obtain handouts and brochures or pocket books.

The undergraduate students were also asked whether they do consult library staff when

stranded with any information problem in the library. All the student's (104) responded to this question with 78 respondents acknowledging seeking assistance from library staff, while 26 respondents said they do not consult librarians at all. Inquiring on how often they sought help from library staff, the majority (41.4 percent) said they seek help only 'sometimes', followed by those who seek help 'most times' (20.2 percent), then 14.1 percent who 'rarely' seek help, and just a few who 'always' seek help. The rest of the students (18.2 percent) do not seek any help at all. Seeking help is an initiative that originates from the information user though to some extent, the environment that the user encounters has an effect on whether the user takes the courage to ask or not. Assessing the case of those who did not seek help at all was therefore not so conclusive because there was need to establish why they did not consider seeking help at all; or it would be concluded that they are always sure and confident whenever seeking information.

Besides seeking help in the library, the students were also asked questions relating to using library facilities that are often clarified during the user education sessions. These included whether they experience any difficulties while using library information retrieval tools in general, and the subject catalogue in particular, service/resource awareness and use–problems, and whether the library system arrangement bothered them when seeking information. The findings are reported as follows: For tool–use difficulties, slightly more than half of the respondents (53.1 percent) experienced problems or difficulties when using them. However, assessing the explanations given, it was found that most of them were as a result of the institutional problems than personal. Of the 52 respondents who found difficulties in using retrieval tools, 48 gave explanations of where the difficulties lay. Twenty–three of these were personal use problems while 25 where based on the institutional procedures of use. On the "institutional side" the students felt the facilities were either inadequate or time consuming. Quoting some of their statements, they complained of scarcity of computers to browse e–resources and use the Internet and the limited time allocated to the use of computers; lack of clear–cut directions in the catalogue, which sections to directly go to, in order to get the books; too few catalogue access points leading to over–crowding at the catalogues; the cards are too many and sometimes mixed up for one to go through to reach what is required, thus time wasting. Furthermore the presence of cards in the catalogue, but with missing books on the shelves (*i.e.* the cards appear in the catalogue but the books cannot be found at the service counters by the staff); going to the library with the hope of getting the required document and there is no card in the catalogue — (un–processed books) and the public relations of staff at service counters are sometimes very poor (*i.e.* rude and high tempered) being other factors.

On the "personal side" the following factors were noted: the student's computer illiteracy levels limits them from using the Internet and the e–resources. One of the respondents put it that "Browsing e–journal publications on the Internet requires a lot of intellectual ability." It was also established that students did not also understand the index to periodicals and that poor catalogue searching skills limited them from using the subject catalogue. Most of them actually avoided using it or only know how to use the Author/Title catalogue. Subject catalogues were not clear to them. For instance one of the respondents put it that "the cards for geography writers are so many that one can not easily find where to get the necessary ones." This implied that one goes in for a search without properly conceiving the particular area of interest. Some do not know how to access a call number of a document from the catalogue. One of the respondents clearly stated that: "I do not know their operation very well."

Concluding on the above analysis, it was clear that most of the problems were experienced as a result of the institutional procedures of use than personal. For this case therefore, the null hypothesis was accepted.

Discussions of the findings

It is established from the findings that students have information needs that relate to their studies. These findings to some extent tally with earlier studies of researchers like Littlejohn and Benson–Tally (1990). However, the disadvantage is that the undergraduate students of Makerere University are still reliant on the transmission view of learning other than the problem oriented learning as found out by Limberg (1999). All the lecturers interviewed confirmed that the students prefer having lecture notes to searching and preparing their own notes.

The undergraduate students were also found to rely mainly on textbooks, with very little use of other information resources like journals (both print and electronic) and CD–ROMs. This could be as a result of not knowing their value and how to use them or not knowing of their existence. This therefore sets a challenge to the information resource providers (the librarians) to play their role in educating and sensitising the users about other useful information resources other than textbooks.

It was established that undergraduate students use the following search strategies when seeking information: Starting (using lecturers), browsing (on the shelves), chaining (using references at the end of books), monitoring (using the card catalogue, library notice board display lists, and colleagues), and extracting (using the card catalogue). The strategies are appropriate but the options used in each strategy are inadequate for the students to exhaustively achieve their goals. The information seeking behaviour of the undergraduate students are therefore quite limited. From their descriptions of the steps they undertook when completing assignments, very little was said, implying they practically follow only the easiest possible ways of getting some information to satisfy the given need. Critically analysing some of the steps they took, the most detailed student described them as: "To complete an assignment, the problem at hand is first read through, internalised, and then the related topics and titles are looked for specifically from the International Development Association (IDA) section catalogue for references." Otherwise, the general trend of describing the steps followed was, reading through the lecture notes given, doing research using textbooks in the library or book bank with reference to reading lists and finally asking friends or holding group discussions to finalize the assignment.

It is noted that a lot is desired in the way the students seek information, through exposure to more information resources and individual vigilance in exhaustively looking for the required information (with consultations from librarians) where necessary. Monitoring options that the students are exposed to in the university library are so limited. More attention needs to be focused here, using Current Awareness Services, Selective Dissemination of Information to target faculties and customizing the information on MakNET (the University electronic network) or on the library Web page.

Interviews with the lecturers showed that much as an effort is made to give reading lists with a variety of information resources (*i.e.* textbooks and journals in print, online databases), the

students still have a preference for textbooks. The lecturers suggested the following remedies: a change in the teaching methods, so that students are encouraged to research and enhance their interest in independently looking for information. One lecturer noted that dependence on lecture notes and handouts undermines independent building of knowledge. Training students to seek information using a variety of sources and sharing information between them is necessary. At the same time it was noted that lecturers' need exposure to online resources and other databases to be able to help themselves and be able to guide the students.

The following were noted as the major factors limiting the students' appropriate utilization of the University Library: limited borrowing of the most relevant books in the closed access section; insufficient copies of the relevant information materials (books); out–dated (old) information materials dominating the stock; poorly conducting user education; reliance on manual information retrieval tools which lead to poor filing and slow retrieval; and, limited sensitisation of the library information resources and services. We add here that Makerere University Library last received government subvention for library books in 1975. The Bookshop where students used to sign for books paid for by the government closed in 1989. The limitation in book provision led in 1985 to the creation of closed access sections within the Main Library, with the Book–Bank scheme introduced in 1990 (Ikoja–Odongo, 1997).

To minimize most of these problems, it was recommended by all respondents that training and sensitisation be used as the main tools to ensure that the students are well equipped and informed of the information resources and services in the University Library. To ensure appropriate sensitisation, the University Library should actually use a variety of marketing tools, including using notice boards in Faculties and Halls of residence; handouts, guides, and instruction booklets to ensure that users are always informed of what to do when in the library. Automating all the library's access procedures would also minimize the problems of using manual information retrieval systems that cause a lot of delays.

Recommendations

The University Library faces a number of challenges in its user instruction programs, yet it is through user education that the librarians' work is made easy and the students' efforts quickened while retrieving and utilizing the library's information resources. In this respect, the current library user instruction program should be enhanced to empower students with the benefit of using information resources in all formats, and be proficient in library use. It is recommended that for information resources to have a direct impact on the students learning processes, the library needs to embark on two broad tasks, namely liaising with the teaching faculties to develop the appropriate collections, and providing a number of new digital information services that can be accessed by many users at a time.

The library should integrate physical expansion of collections and buildings as well as propose a well–planned user instruction and information skills program. It should lobby for funds to increase the print collections; electronic collections; including serials and reference databases; expand on the access points — probably electronically; and, increase the number of librarians serving the ever growing population of students in the University. All these should be done while addressing the information demand so that the resources are appropriately utilized.

Since Makerere University Library is in the automation process with the first online catalogue commissioned on 17 December 2003, the following user education strategies could be tried

out: creating a set of two–hour workshops to teach students how to use the Online Public Access Catalogue (OPAC); use Online databases; use CD–ROM resources; and, carry out Internet navigation, and use selected Web sites. It is also necessary that the library organizes the user education program in an up–to–date technology environment (electronic class) with at least 50 personal computers, with Internet access, networked CD–ROMs, access to the OPAC, and all the audiovisual gadgets needed for a hands–on information search experience. Meanwhile, manuals should accompany the programs with documented instructions for exercises, a quick general library tour (physically or on video). The program should have practical homework based on the subject of the students or faculty choice and have provisions for evaluating the workshops for future improvements.

For first year undergraduate students, the program could be used as a prerequisite course, providing basic training with 75 percent of the time devoted to hands–on practice. The quality of homework assignments should be graded by the instructors (librarians) and results submitted to the departments where the students belong. This could be a requirement for all first years to register for their second semester. This implies setting up a special academic unit, staffing it and leaving the University Library to manage the program. The units staff could organize for the first year students to sign in for the user–instruction course during normal university registration such that they each choose the week and time convenient for them to attend the workshops. As a reminder, the library should use banners hang around the university urging the students to take the course. For it to be effective, it should be declared compulsory by the University Academic Senate so that it is made part of the general University curricula.

Networked information services (probably on MakNET) should be introduced for all users to share so that libraries off–campus or located away from the Main Library can conduct the same services within their localities. There is need for quick infrastructure development within the institution and the country at large.

The program instructors (the librarians) also need to be taken through refresher courses on how to prepare the instructional materials, classroom communications and coursework evaluation, among other teaching techniques.

For publicity of the libraries resources and services, the following could be done:

1. Use of attractive posters in each section of the library describing the services and scope of collections;
2. Issue out pamphlets about the library services and workshops;
3. The user instruction workshops should be marketed using flyers and pamphlets, promoting the collections, services and library regulations in general and provide current editions of video coverage that includes new developments in the library to be used to introduce fresh students to the library and its services;
4. Be creative in producing posters and postcards depicting library topics. This could turn out to be a money–generating venture;
5. Library personnel should publish articles, news releases and short communications for the university news publications to increase on the sensitisation mechanisms or use the library Web page for publicity;
6. Students should also properly be initiated and guided into being good information

resource users so that they do not depend mainly on lecturer notes to accomplish their knowledge goals;

7. Reading and research should be the dominating activity of which information literacy is the foundation; and,

8. Lecturers should take the lead in initiating library use to their students, with the librarians left to ensure that the students are appropriately informed and guided.

Conclusions

Understanding the actual needs of information users and taking steps to satisfy them is the first step towards effective service provision. This can best be achieved through formal in–depth studies. Librarians, especially those involved in bibliographic instruction should be interested in ways individuals approach the library and the methods they use to search for needed information. Librarians could redesign strategies intended to improve the provision of library services especially towards information skills development and information resource awareness.

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