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# Cognitive Factors that Influence Information-seeking Behavioural Process Amongst Postgraduate Students: A Case Study from Kenyatta University Post-modern Library in Nairobi, Kenya

**D. W. Muthee**

School of Education, Kenyatta University, PO Box 43844-00100, Nairobi, Kenya  
(E): dwambiri@yahoo.com

**J. M. Masinde**

School of Information Management, Central China Normal University, No.152 Luoyu Road  
Wuhan – 430079, Hubei, P R China  
(E): masindejohnson@mails.ccnu.edu.cn

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## Abstract

This article discusses the salient features of a case study carried out among postgraduate students at Kenyatta University Post-modern Library. The study was primarily focused at recognizing cognitive factors, responsible for influencing library users' information-seeking behaviour. In order to develop the variables, Vroom's Expectancy Theory of motivation was used. A descriptive survey method was utilized to study a sample size of 384 students spread across four main schools:

(i) Education, (ii) Business Studies, (iii) Humanities and Social Sciences, and (iv) Science and Technology. Results confirmed that expectancy theory can be utilized to explain students' information-seeking behaviour. Three different groups—some with strong, others with medium, and rest with weak influences—were found. Interaction service quality, driven by students' perception of service quality was found to be the most critical. Information needs satisfaction (outcomes) together with student users' perception of service quality amongst others informed their level of satisfaction with the overall service.

The findings support the idea that understanding cognitive information behaviour can help university libraries to plan more appropriate services. The implication of this study is that there are particular key cognitive drivers that trigger users' information-seeking behaviour in academic libraries.

**Keywords:** Cognitive factors, Information seeking, Expectancy theory, Motivation, Postgraduate students

## Introduction

Information seeking is conceptualized as a process of reducing uncertainty (Caperon 2014). It occurs when an individual senses a problem situation which internal knowledge does not satisfy, normally referred to as the mental state—Anomalous State of Knowledge (ASK). Information is an ordered sequence exercise involving affective, cognitive, and sensory motor elements (Masinde 2016). The sequence arises out of a motive (affective behaviour) which selects the interpretation which is in harmony with it (cognitive behaviour), resulting in an act (sensorimotor) (Nahl 2010).

At the root of information seeking are personal cognitions which are known as cognitive needs. Weights argued that there are three categories of cognitive needs: (i) need for new information, (ii) need to elucidate the information held, and (iii) need to confirm information held (Weights 1993). The motives that give rise to cognitive needs resulting in information seeking are physiological, affective, and cognitive (Carol 2003; Savolainen 2013). This study was concentrated on the cognitive information-seeking behaviour.

Cognitive approaches examine the individual user attributes as the main driving force behind information-seeking behaviour. Such an approach would help libraries to answer basic questions such as: why do students use, stop, or avoid using university libraries?

Earlier studies that investigated information-seeking behaviour (Conrad 2014; Kassim 2017; Masinde 2016; R Savolainen 2013), were mainly concentrated on the means and processes by which users seek information, the sources of information, the behavioural patterns in different service environments and the influence of academic disciplines in information seeking. The studies have similarly explained when users start the information-seeking process, the strategies they employ when seeking information and when they completely stop searching for

the information. Nonetheless, the studies have not sufficiently explained why library users make choices to use or avoid using libraries. The cognitive variables that motivate the users to seek information have not been adequately explained or are incomplete (Nahl 2010; Savolainen 2013). Such a situation creates a knowledge gap amongst library service providers. Thus, the studies have not addressed the central question of cognitive information-seeking elements which drive it. They have failed to explain why users seek information. This calls for focusing on cognitive behaviour and developing cognitive approaches of information seeking (Brindesi 2013; Tambala 2010). It is worth mentioning that a cognitive approach is user centred, stet. Such an approach demands that libraries customize the services, add value to information resources, give users more direct support in research and be part of their problem-solving process. This study focused on the cognitive attributes of individual users to explain the information-seeking process. It used the cognitive attributes of the postgraduate students, principal library users in Kenyatta University Post-modern Library.

## Statement of the Problem

Many times students avoid consulting the library because of negative past experiences with library staff that lack understanding of cognitive and affective elements of information seeking. This is mainly because the library service design has not been developed on the basis of understanding of human-information interaction of the intended users (Kassim 2017). Thus, there is need to examine how human-information behaviour research can help information system design in order to bridge the gap between library users and services (Masinde 2016). Recent research has also suggested a paradigm shift from system-centred to user-centred research to define, measure, and explain the information-seeking behaviour of users (Savolainen 2013).

Kulthau's work mainly focuses on the cognitive viewpoint formulated information-searching process, represented by six stages of inquiry (initiation, selection, exploration, formulation, collection, and presentation) from affective, cognitive and actions points of view; confirming the stages an individual moves through in information seeking (Kulthau 2004). Her research did not show the different motivations that trigger the information seeking. Resultantly, it failed to explain the model. This gap called for research of the cognitive elements that drive the mental activities of information seekers in the library. This study intends to fill this gap by focusing on the cognitive factors derived from the Vrooms Expectancy-Value theory to explain the drivers and triggers of information seeking, with main emphasis on exploring the period prior to users' decision to approach a library to ask for help.

### **Purpose of the Study**

The purpose of the study contained in this article was to identify cognitive factors that can explain the library users' information-seeking process of postgraduate students at the Kenyatta University Post-modern Library, based on the expectancy theory of motivation.

### **Research Objective**

To determine the cognitive factors that influence information-seeking behavioural process.

### **Significance of the Study**

University library users are consumers of information from a wide variety of sources including people, web services, and libraries. Information-seeking behaviour among users is driven by cognitive, affective, or physiological needs. This study considered the cognitive variables that drive users' information-seeking behaviour. The findings can be used to design a library service to meet users' information needs, based on users' cognitive information process.

### **Conceptual Framework**

The conceptual model in this study is based on Expectancy Value Theory, as introduced by Vroom (Vroom 1964) and imported by Porter, Lawler, and Campbell (Porter and Lawler 1968; Campbell 1970). The common factors are outcomes (valence) and individual's personal probability estimate of task accomplishment (expectancy) instrumentality, value of outcome, and effort. These perceptions are affected by service personnel's (interaction service quality) and users' past experience. These factors largely influence both service providers and users.

In this study, outcomes were considered as information needs and service satisfaction, which a postgraduate library user seeks through the use of the service. Performance is the person's subjective probability about the likelihood that he/she can perform at a given level or that effort on his part will lead to successful performance or acquisition of the required results. This expectancy can be influenced by the individual's past experience with the service. A combination of value of outcome and the expectancy level can help determine the cognitive motivational force or effort the individual will apply.

Library-user interaction with the reference librarian was considered an important component of user satisfaction with the reference service. Khaola argued that interaction with reference librarian influences users' perception of service quality which is influenced by outcomes, interactions, and physical (environment) surroundings of the service (Khaola 2015). The interpersonal interactions that take place during service delivery had a great effect on service quality perceptions among postgraduate users. User service performance can be referred to determine how well a user performs the basic requirements of a service without difficulties. This study focused on the users' role in service delivery and can be influenced by the service personnel's response and the users' past

experiences. Service personnel's (staff) attributes include professional competencies (knowledge and skills) of the librarian, courtesy, and willingness to help.

### Literature Review

Psychological literature focuses largely on the concept of cognitive dissonance as a motivation for behaviour. Conflicting cognitions make people uncomfortable and consequently they seek to resolve the conflict. One way in which dissonance may be reduced is by seeking information— either to support existing knowledge or to add new knowledge. Motivation is the determinant of an individual's thought and action: why an individual's behaviour is initiated, persists, and stops. This also depends on what choices are made by the individual in certain circumstances. The aspiration to accomplish a goal, pooled with the energy to work towards accomplishment of that goal enhances a person's interest, urge, and ability to complete task even when the task seems difficult or uninteresting. Motivation is the force that guides our behaviour. It can be seen as either intrinsic or extrinsic. If intrinsically motivated, a person can perform a task even if there is no reward (Deci 1985). On the contrary, a person is extrinsically motivated when an activity is rewarded by incentives not associated with the task. Incentives cause people to perform a task even if it is not of their interest. Motivation theories can be categorized into two groups: (i) content theories and (ii) process theories. Content theories which place emphasis on factors within an individual that direct, sustain, and stop behaviour are largely driven by Abraham Maslow's Hierarchy of Needs Theory (1943) and Herzberg Two Factor Theory. Process theories analyse and describe how individual behaviour is directed, sustained, and stopped. Goal Setting Theory and Expectancy-Value Theory are mainly utilized to achieve this (Porter 1968; Vroom 1964).

Individuals will be motivated if they meet three criteria. They must value the behavioural outcome valence and they must believe that the desired behaviour is instrumental in achieving the valent outcome. This means that individuals must expect that if they perform task in a particular way, they will receive certain things. Third, they must expect that they are capable of performing the behaviour that is instrumental in achieving the outcome. The common factor in all process motivation theories is the emphasis on the cognitive processes in determining individual level of motivation and the capacity to explain motivational factors of individuals in various settings and situations. The proposed study utilized a cognitive approach to explain variations according to the attributes of the individual library users. The results of the study can be used for the creation of a model to confirm the information-seeking motivational process.

The Expectancy Theory of Motivation (Vroom 1964) on which this study is based, suggests that individuals will be motivated if valence, expectancy, and instrumentality are present. According to Vroom, an outcome is positively valiant when a person prefers to attain it and it is negatively valiant when a person prefers not to attain the outcome. Valence is the value of outcomes to the individual (Vroom 1964).

When information users choose between alternatives which involve certain outcomes, their behaviour is affected by the degree they believe the outcomes to be probable (Vroom 1964). Such beliefs are probabilities or expectancies. An expectancy is a momentary belief, followed by a particular outcome. The range of expectancy can be from zero to one. Zero expectancy is a person's probability that his act will not be followed by outcome. Expectancy is a person's estimation of the probability that effort will lead to successful performance. That belief is based on the confidence a person has in

his/her own capacity to influence outcome. This is defined as self-efficacy.

The perceived probability that good performance will lead to desired outcomes is referred to as instrumentality. It is related to individual beliefs or expectations that if a person behaves in a particular way, he will get certain things. Porter and Lawler improved Vroom's theory (Vroom 1964) by adding several factors (Porter and Lawler 1970). Two of the most notable factors are:

1. Value of reward
2. Effort–reward probability outcomes of an individual

This is the same as valence (Vroom 1964). Judging the values of the rewards, individuals determine the effort they put into their works 'effort–reward probability', generally is perceived as the probability that there is a close relationship between effort and reward. According to Campbell, outcome is instrumental to obtain need satisfaction (Campbell 1970). This study includes value of outcomes and expectancy as variables. The value of outcome is an anticipated one; with which users expect to benefit; when their needs are satisfied from the use of service. This expectancy can be influenced by the library users' past personal experience with the service.

## Methodology

The purpose of this study was to assess cognitive determinants of library users' information-seeking motivational process. The determinants were based on Vroom's Expectancy Theory of Motivation (Vroom 1964). The Theory suggests that individuals will be motivated if the following three factors are present:

1. Valence – they must value the outcome
2. Expectancy – they should expect that they are capable of performing the behaviour that is instrumental to the outcome
3. Instrumentality – they must believe that

the desired behaviour is instrumental in achieving the valent outcome

To achieve the intended overall objective, this study chiefly focused on the determinants that influence the user motivational process.

## Research Design

This study used survey design as a framework for the collection of data. The survey research was cross-sectional and the data was organized on the basis of a questionnaire and focus group interview guide. The collected data—quantitative in nature—was collected from the Department of Library and Information Science. The research examined different variables, their relationship, and contribution to the library user motivational process.

### *Variables*

A variable is an attribute on which cases vary. Cases in this study are students who use the library for their knowledge access. The independent variables in the study are the information needs and the expectancy levels. The dependent variables are the user service performance. These variables are influenced by users' past service experience.

## Value of Outcomes

According to Vroom, value of outcome is the valence (Vroom 1964). The valence is an individual's subjective judgment about possible outcomes. There can be a discrepancy between the anticipated satisfaction from an outcome (valence) and the actual satisfaction from the outcome (value).

### *Effort to Performance Expectancy*

This is the second variable in this study. It is the library user's estimated probability that he or she can accomplish a task. It is the likelihood that a user can perform a task at a given level and that his/her effort will lead to successful performance.

This was scored on a Likert scale on three main areas: the conviction that a user will be able to access the service without difficulties, that he or she will be able to use the service without problems, and that he or she will be able to communicate with the librarians offering the service.

### *Efforts by the User*

This is the amount of energy library users exert in the information-seeking process. According to Porter, effort is influenced by the value of rewards (Porter 1968). If the rewards can satisfy individual's needs for security, self-esteem, autonomy, and self-actualization, the rewards are considered valuable to the individual.

### **Service Performance/ Accomplishment**

The study examined how well a library user performs the basic requirement of the reference service (without difficulty). This variable focused on users' role in service delivery. Issues and challenges, faced by the users, in accessing information while performing the tasks were assessed and scored.

### *User Perception: Interaction Service Quality*

Interpersonal interaction that takes place during the service delivery between the reference librarian and the user was assessed. It considered the service providers' response, willingness, courtesy, and ability of the service personnel. The users' perception of the service quality is an important aspect of the study.

### *User's Past Experience*

This is mainly in reference to the previous experience a user had with the service. It summarizes the overall experience by the service user. This is important because it influences people's convictions in their own effectiveness or self-efficacy (Deci 1985).

## **Library Users' Service Satisfaction**

It is the subjective judgment of the service by the user. It includes service features, attribution of service (success or failure), and perceptions of equity and fairness.

### *Location of the study*

This study was carried out in Kenyatta University Post-modern Library in order to determine role of a library to support teaching, learning, and research. Kenyatta University was selected because the Post-modern Library has the best postgraduate facilities with a sitting capacity of 6000 students. New information technology-based services are also being offered by the library.

### **Sampling Technique and Sample Size**

To select the participants of the study, purposive method of sampling was used. The study targeted to collect data from a sample of 384 students out of a total of 13,193. The design demanded that the data be collected at one point in time from a specified population (Ary, Jacobs and Sorensen 2010), for the reason that the data collected was subjected to correlation analysis. Postgraduate library users were intercepted in the postgraduate floor of the Post-modern Library. The purpose of the research was explained to them and then they were requested to spare a few minutes to fill in the questionnaire.

A quota sampling approach was applied. The purpose for this was to produce a sample that would reflect the total postgraduate students' population. Out of a census of 13,193 students it was expected that 384 students would be in the sample. For the purpose of this study, 95% confidence level was expected. This corresponded to a 'Z' score of 1.96 and a 5% margin of error (Saunders 2009).

## Research Instruments

The study used a questionnaire which was developed on the basis of the objectives of the study and the variables. The variables were: Interaction service quality, Effort to performance expectancy, User needs satisfaction, Service performance (service satisfaction), Effort by the user, Outcome, Value of outcomes, Users' past experience, and Gender relationship with cognitive variables.

## Findings, Interpretation, and Discussion

### *Factors that influence information-seeking process*

#### *Performance Expectancy*

Three main variables were examined on performance expectancy of students:

1. Ability to access face-to-face reference service without difficulties
2. Ability to understand how to communicate with face-to-face reference librarians
3. Ability to use reference service without any problem

The overall findings on the three abilities are reported below:

Majority of the respondents (70.9%) agreed that they were able to access reference service without difficulties. A high proportion (76.4%) of the respondents agreed or strongly agreed that they were able to understand how to communicate with face-to-face reference librarians. A high proportion (67.4%) reported that they would be able to use reference service in the future without a problem. Overall, more than three-quarters of the respondents had a high performance expectancy, based on the three abilities.

A small proportion (11.8%) anticipated that they would have problems in face-to-face communication with reference librarians. An

almost equal proportion of respondents (11.9%) were not sure about success/failure of their face-to-face communication with reference librarians.

Asked whether they were convinced that they would be able to use reference service without any problem, a total of 67.4% were fully convinced that they would be able to use reference service without difficulty. Close to one-fifth (18%) were of the opinion that they would not be able to use reference service without difficulties. The majority of the students had high belief in their capacity to help themselves.

The emerging pattern was such that there was consensus in the way the respondents scored their expectancy: those who could access were also able to understand and use the reference service.

### **Effort by the User to use Face-to-face Reference Service: Overview**

The effort by the users to use face-to-face reference service was assessed in two main areas:

1. Extent to which effort was made to use reference service
2. Rating the level of effort spent on reference service

### **Overall No Problems with Communication with Reference Service Versus Extent to Use Reference Service**

Among the respondents who strongly agreed that they had no problem with communication, about one-fifth rated their effort to use reference service as high (18.5%) or very high (5.2%). Their effort to use reference service was mainly low (24.2%) or medium (36.4%). The low- and medium-effort users constituted over half (57.6%) of the respondents who strongly agreed that they had overall no problem with communication with reference service. About 75.9% of the respondents who reported that they had problems communicating with reference

service rated their extent of use as low (34.5%) or medium (41.4%). The majority of those who had communication problems with reference service tended to be low or medium users of the services. Their level of usage was similar to those who had agreed that they did not have problems with communication [low (22.4%) and medium (42.4%) users]. Those without problems and

those who had problems communicating with reference service considered themselves to be either low or medium users of service. Table 1 gives the pattern of use of reference service.

Table 2 lists the users per school who had no problems with communication with reference service versus extent to use reference service.

**Table 1:** Pattern of use of reference service

Overall no problem with communication	Low (%)	Medium (%)	Total (%)
Strongly disagreed	21.7	40.4	62.1
Disagreed	34.5	41.4	75.9
Agreed	22.4	42.4	74.6
Strongly agreed	24.2	36.4	57.6

**Table 2:** Extent to use versus problem with communication by schools

School	Extent to use reference service	Overall no problem with communication with reference service					Total (%)
		Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)	
Humanities and Social Sciences	Low	2.6	5.3	7.9	2.6	2.6	21.1
	Medium	15.8	15.8	7.9	13.2	0	52.6
	Neutral	0	2.6	2.6	0	0	5.3
	High	0	5.3	5.3	2.6	2.6	15.8
	Very high	0	2.6	2.6	0	0	5.3
	<b>Total</b>	<b>18.4</b>	<b>31.6</b>	<b>26.3</b>	<b>18.4</b>	<b>5.3</b>	<b>100.0</b>
Science and Technology	Low	4.1	8.1	9.5	9.5	1.4	32.4
	Medium	2.7	12.2	6.8	21.6	1.4	44.6
	Neutral	0	0	1.4	1.4	0	2.7
	High	0	4.1	1.4	6.8	1.4	13.5
	Very high	0	1.4	0	4.1	1.4	6.8
	<b>Total</b>	<b>6.8</b>	<b>25.7</b>	<b>18.9</b>	<b>43.2</b>	<b>5.4</b>	<b>100.0</b>

*Contd...*

Table 2 *contd...*

School	Extent to use reference service	Overall no problem with communication with reference service					Total (%)
		Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)	
Education	Low	2.3	2.3	2.3	7.0	2.3	16.3
	Medium	2.3	11.6	7.0	20.9	11.6	53.5
	Neutral	0	0	0	2.3	0	2.3
	High	0	4.7	2.3	9.3	4.7	20.9
	Very high	0	2.3	0	2.3	2.3	7.0
	<b>Total</b>	<b>4.7</b>	<b>20.9</b>	<b>11.6</b>	<b>41.9</b>	<b>20.9</b>	<b>100.0</b>
Business Studies	Low	0	2.9	0.0	2.9	0	5.7
	Medium	0	11.4	14.3	28.6	2.9	57.1
	Neutral	2.9	0	2.9	0.0	2.9	8.6
	High	0	0	2.9	17.1	0	20.0
	Very high	5.7	0	0	2.9	0	8.6
	<b>Total</b>	<b>8.6</b>	<b>14.3</b>	<b>20.0</b>	<b>51.4</b>	<b>5.7</b>	<b>100.0</b>
Others	Low	0.0	13.3	6.7	8.9	2.2	31.1
	Medium	4.4	8.9	15.6	11.1	4.4	44.4
	Neutral	0	0	0	0	2.2	2.2
	High	0	2.2	6.7	2.2	6.7	17.8
	Very high	0	0	2.2	2.2	0	4.4
	<b>Total</b>	<b>4.4</b>	<b>24.4</b>	<b>31.1</b>	<b>24.4</b>	<b>15.6</b>	<b>100.0</b>

Most of the respondents assessed the extent of their efforts to either (23.8%) or medium (47.1 %) in using face-to-face reference service. A total of 70.9% of the postgraduate students put either low or medium effort. Only one-fifth of the respondents put in high or very high effort, to use face-to-face reference service.

The users rated their levels of effort spent in the face-to-face reference service to either

(25.7%) or medium (46.2%). The majority (71.9%) of the respondents were within that cluster. One-fifth (19.9%) rated their efforts to be either high (16.2%) or very high (3.7%). The extent of effort (70.9%) to use face-to-face reference service and level of effort (71.9%) spent using the service were comparatively close. Table 3 gives the level of effort versus problems using digital reference service by various schools.

**Table 3:** Level of effort versus problems using digital reference service by various schools

School	Rating level of effort spent on reference service	Overall no problem with digital reference service					Total (%)
		Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)	
Humanities and Social Sciences	Low	5.3	10.5	5.3	2.6	2.6	26.3
	Medium	13.2	7.9	7.9	7.9	2.6	39.5
	Neutral	5.3	2.6	2.6	0	0	10.5
	High	2.6	7.9	5.3	2.6	0	18.4
	Very high	2.6	2.6	0	0	0	5.3
	<b>Total</b>	<b>28.9</b>	<b>31.6</b>	<b>21.1</b>	<b>13.2</b>	<b>5.3</b>	<b>100.0</b>
Science and Technology	Low	5.4	13.5	4.1	8.1	2.7	33.8
	Medium	5.4	13.5	2.7	14.9	2.7	39.2
	Neutral	1.4	2.7	0	2.7	1.4	8.1
	High	0	8.1	4.1	2.7	1.4	16.2
	Very high	0	1.4	0	1.4	0	2.7
	<b>Total</b>	<b>12.2</b>	<b>39.2</b>	<b>10.8</b>	<b>29.7</b>	<b>8.1</b>	<b>100.0</b>
Education	Low	10.0	2.5	5.0	5.0	2.5	25.0
	Medium	2.5	15.0	12.5	17.5	0.0	47.5
	Neutral	0	0	0	0	2.5	2.5
	High	5.0	7.5	2.5	2.5	0	17.5
	Very high	0.0	5.0	0.0	2.5	0	7.5
	<b>Total</b>	<b>17.5</b>	<b>30.0</b>	<b>20.0</b>	<b>27.5</b>	<b>5.0</b>	<b>100.0</b>
Business Studies	Low	0.0	2.9	2.9	5.9	0	11.8
	Medium	17.6	11.8	5.9	20.6	2.9	58.8
	Neutral	2.9	0	2.9	0	0	5.9
	High	2.9	5.9	2.9	5.9	0	17.6
	Very high	2.9	2.9	0	0	0	5.9
	<b>Total</b>	<b>26.5</b>	<b>23.5</b>	<b>14.7</b>	<b>32.4</b>	<b>2.9</b>	<b>100.0</b>
Others	Low	2.1	25.5	0	2.1	0	29.8
	Medium	6.4	27.7	0	6.4	6.4	46.8
	Neutral	0	2.1	0	4.3	2.1	8.5
	High	2.1	4.3	4.3	2.1	0	12.8
	Very high	0	2.1	0	0	0	2.1
	<b>Total</b>	<b>10.6</b>	<b>61.7</b>	<b>4.3</b>	<b>14.9</b>	<b>8.5</b>	<b>100.0</b>

### Level of Effort Spent on Reference Service Versus Problems with Communication with Reference Service

Majority of the students rated their level of effort spent on reference service as low or medium. On communication with reference service, almost half (48.6%) of the respondents in Humanities and Social Sciences had problems with reference librarian while 24.3% reported to have no problem(s) communicating with reference service. Figure 1 shows the level of effort spent versus overall problem with digital reference service.

The majority of students put in either low or medium effort to use reference service. Education (62.8%) and Business Studies students (57.1%) reported that they had minimal problems communicating with reference service. Half of the Humanities and Social Sciences students (50%) faced more challenges than rest of the students from other schools in communicating with reference service. However, most of them did not put in high effort (23.7%). Table 4 gives summary of efforts by schools versus problems in communicating with reference service.

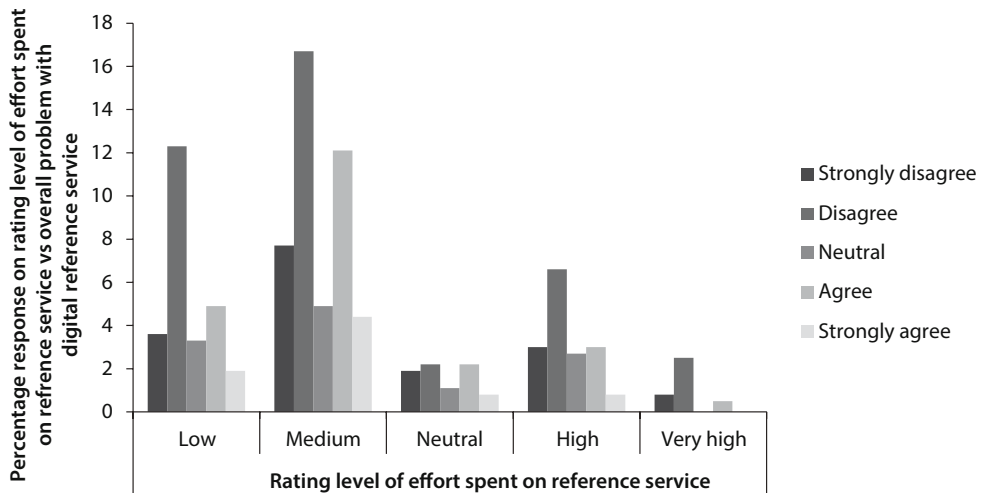


Figure 1: Level of effort spent versus overall problem with digital

Table 4: Summary of efforts by schools versus problems in communicating with reference service

School	Effort by school (%)	Level of problems in communication (%)
Humanities and Social Sciences	73.7	50.0
Science and Technology	77.0	32.5
Education	69.8	25.6
Business Studies	62.8	22.9
Others	75.5	28.8

Efforts made by reference service users were found to be positively correlated to service performance by users. A positive correlation of 0.12 to service performance was established. This meant that it could explain 1.44% of shared variance between the two variables. The finding was found to be statistically significant at the 0.08 level of significance. The finding—half of the students from Humanities and Social Sciences faced problems in communication—concluded that there was a major gap between the reference librarians and the students.

### Effort by Users Versus Expectancy

Majority of students rated their total effort above 70%, except for the students of Business Studies

(62.8%) and Education (69.8%) (Table 5). Students from the Humanities and Social Sciences and Science and Technology schools put in the highest effort whereas least efforts were made by the students of school of Business Studies.

Table 5 lists the efforts put in by students from various schools.

Expectancy among students from various schools was assessed from three perspectives:

1. Ability to access face-to-face reference service
2. Ability to understand how to communicate with face-to-face reference service
3. Ability to use reference service without problems

Table 6 gives the comparison between effort and ability to access reference service per school.

**Table 5:** Efforts put in by students from schools

School	Low (%)	Medium (%)	Total (%)
Humanities and Social Sciences	21.6	51.4	73.7
Science and Technology	32.4	44.6	77.0
Education	17.1	53.7	69.8
Business Studies	5.7	57.1	62.8
Others	31.9	42.6	74.5

**Table 6:** Comparison between effort and ability to access reference service

School	Extent of effort (%)	Ability to access (%)
Humanities and Social Sciences	73.0	59.4
Science and Technology	77.0	74.3
Education	70.8	80.4
Business Studies	62.8	65.8
Others	74.5	66.0

The data showed that the Humanities and Social Sciences students had the lowest level of expectancy (59.4%) to access reference resources without problems. Students from Education school had the highest (80.4%) level of expectancy to access reference resources. In fact, difference of level of expectancy between students of Education and that of Humanities and Social Sciences was 21%. Humanities and Social Sciences students exerted the highest effort, however, they did not have an equally high expectancy to access reference service. In comparison to the students of Humanities and Social Sciences, Education, and Science and Technology students put in less effort, yet their expectancy level was high. In fact, they had the highest level of expectancy to access reference service without problems. The aspect of

expectancy (self-belief) was noticeably higher in Education and Science and Technology students.

It is worth mentioning that Education and Business Studies students' expectancy (self-belief) on their understanding of how to communicate with reference librarians was higher in comparison to the efforts they put in. The Humanities and Social Sciences students' level of expectancy (self-belief) on their understanding of how to communicate with reference librarians was found to be equal to the efforts they put in. Business Studies students had the highest expectancy level (self-belief) than the rest of the students while students from Humanities and Social Sciences had the lowest expectancy (self-belief) level of understanding on how to communicate with reference librarians. Table 7 gives the ability to communicate (per school) versus extent of effort.

**Table 7:** Ability to communicate versus extent of effort

School	Able to communicate (Expectancy) (%)	Neutral (%)	Extent of effort (%)	Neutral (%)
Humanities and Social Sciences	73.7	13.2	73.0	5.3
Science and Technology	75.6	9.5	77.0	2.7
Education	80.4	7.3	70.8	2.4
Business Studies	82.4	11.8	62.8	8.8
Others	74.5	10.6	74.5	2.1

**Table 8:** Effort and ability to use reference service

School	Expectancy (in %)	Effort (low and medium) (in %)
Humanities and Social Sciences	63.1	73.7
Science and Technology	71.6	77.0
Education	74.4	69.8
Business Studies	70.6	61.8
Others	65.9	74.5

Table 8 gives the efforts and abilities of the students from various schools to use reference service. The Humanities and Social Sciences students rated their expectancy level (self-belief) to use reference service comparatively lower (63.1%) than the rest of the students from Education (74.4%), Science and Technology (71.6%), and Business (70.6%).

On the correlation of effort and expectancy by users, a positive correlation of 0.12 was established. This meant that they could explain 1.44% of shared variance between effort and expectancy. This finding was not statistically significant at the ‘0.00 level’ of significance.

### Performance/Accomplishment Versus Effort by Users

Performance/accomplishment by users was concluded by two inference statements:

(i) overall students had no problems with digital reference service and (ii) overall there were no problems in communicating with the reference librarians. The users’ effort was assessed by both the extent and the level of effort they made to use face-to-face reference service. The percentage

of those who had problem with use of digital reference service was either low (22.6%) or medium (50%). Only 24.2% of the users who had no problem with the use of digital reference service reported use of reference service as high (17.7%) or very high (6.5%). Half (50%) of the respondents who had problem with digital reference service rated their extent of use of service as medium. Out of the users who reported that they did not experience problems with digital reference service, about 27.9% rated their use of reference service as low. Majority of those (74.2%) who had problem with digital reference service reported low and medium use of service. A small group (23.8%) rated use of reference as high or very high. Majority of students had problems using digital reference service. Among those who reported to have no problems with digital reference service, nearly 40% of them had high use of reference service. This category of users had utilized reference service more than those who faced problems with digital reference service. Figure 2 gives an overview of the overall problems communicating with reference service versus level of effort spent on reference service.

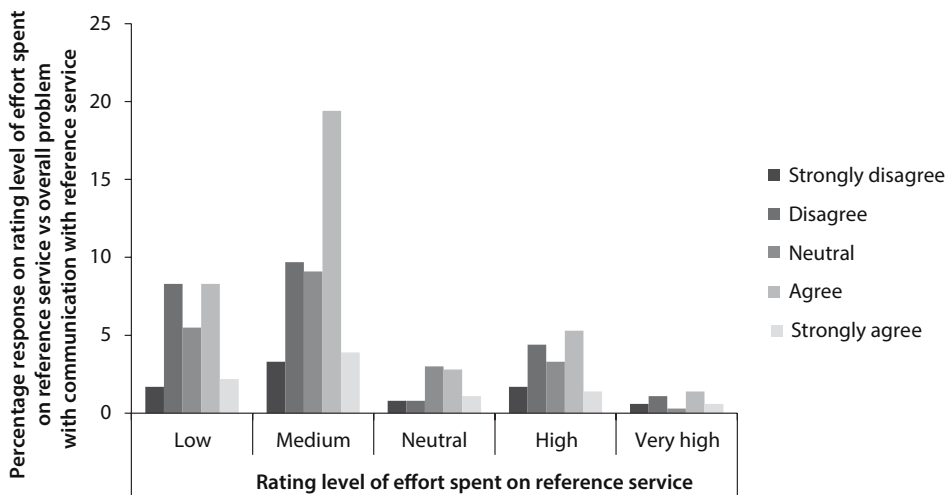


Figure 2: Overall problems communicating with reference service versus level of effort spent on reference service

### Problem with Digital Reference Service Versus Level of Effort Spent on Reference Service

The users who strongly agreed that they had no problem with digital reference service, scored their level of effort as low (24.1%) or medium (55.2%). Those who put in high effort were only 10.3%. A similar pattern was observed between users who did not have problems with digital reference service and those who rated their effort to be either low (21.7%) or medium (53%). Again only one-tenth (9.6%) rated their effort to be high and a very small proportion (2.4%) rated their effort to be very high. The majority of students who had no problem in utilizing digital reference service rated their effort to be either low or medium.

Respondents who had serious problems with digital reference rated their effort to be low (21%) or medium (45.2%). About one-fifth

of the students put high (17.7%) or very high effort (4.8%). Similar pattern was observed among those who agreed that they had problems using digital reference service [as they put low (30.6%) or medium effort (45.2%)]. Majority of the students expended low or medium effort, regardless of whether they had problems with digital reference or not.

### Performance/Accomplishment of Service Versus Outcomes

Service performance/accomplishment of the service was assessed from two perspectives. These were the problems faced with digital reference service and communication with reference service librarian. The outcomes were assessed on the basis of helpfulness of information received, satisfaction with the information acquired, usefulness of information acquired through face-to-face reference service and satisfaction with digital service.

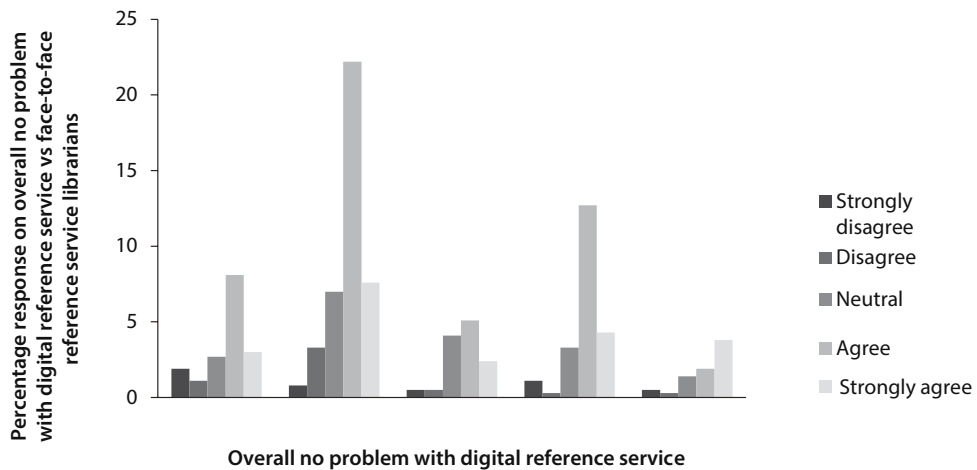


Figure 3: Problems with digital versus helpfulness of face-to-face reference service

The majority of students (71.2%) agreed with the statement that “face-to-face reference service librarians gave helpful information” and 10.2% did not agree this. In fact, only 4.9% strongly disagreed with the statement that “the face-to-face service librarian gave helpful information”. Over half (57.7%) of the same respondents reported that they had problems with digital reference service. One-third (29.6%) reported that they had no problems with digital reference service. Figure 3 shows problems with digital versus helpfulness of face-to-face reference service.

Majority of respondents were of the opinion that the face-to-face reference librarians gave helpful information. At the same time, most of them reported that they had challenges using digital reference service. A significant proportion of respondents (46.3%) had no

problem communicating with reference librarians but 32.6% reported having problems communicating with the librarians. On face-to-face communication, 21.1% were either neutral or undecided. Nearly 71.2% thought the librarians were helpful while 32.6% had problems communicating with them. Considering half of those who were undecided and those who had problems communicating with the librarians, it would mean that over 40% had problems communicating with the librarians. Communication came out as a major issue in the provision of reference service. Although most students considered reference librarians to be helpful, they had problems in dealing with digital resource and communicating with reference librarians. Figure 4 shows communication with reference service versus helpfulness of librarians.

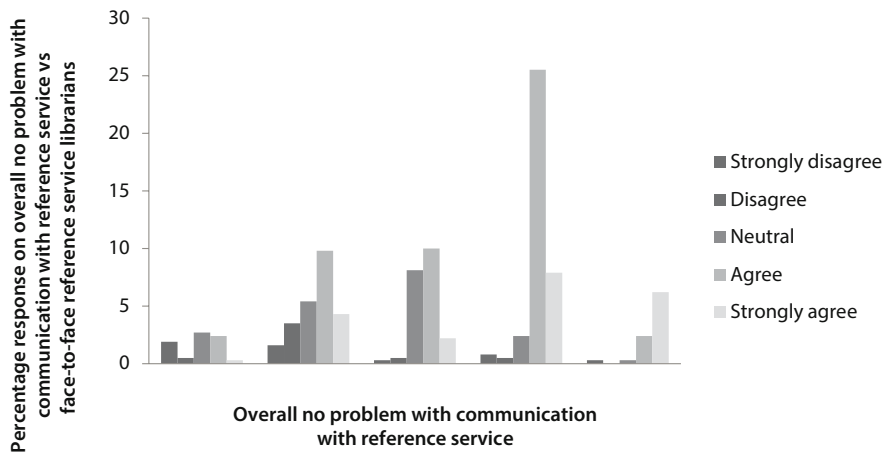


Figure 4: Communication with reference service versus helpfulness of librarians

One-fifth of the respondents (22%) were dissatisfied with the information acquired through digital reference service while 57.3% reported to have problems using digital reference service. Nearly 57.3% users faced serious challenges using digital reference service, same proportion of users (57.3%) were found to be satisfied with the information they acquired through digital reference service.

A medium positive correlation ( $r=0.39$ ) was established between users' satisfaction with the information acquired through face-to-face reference service and communicating with reference librarian. Correlation of 0.39 means that there was 15.2% of shared variance on the user satisfaction and communication with the reference librarian. This was, however, not statistically significant at '0.001 level' of significance.

Overall 56.9% of the respondents faced problems with digital reference service. One-third (30.6%) did not face any problem with digital reference service. However, problems with digital reference service were not positively correlated with usefulness of information

given by face-to-face librarians. This finding is statistically significant at the '0.318 level' of significance.

### Satisfied with Information Acquired Through Digital Reference Service Versus Problem with Communication with Reference Service

More than half of the users were satisfied with information acquired through digital reference service (57.2%) whereas 45.7% reported that they had no problem communicating with reference service. One-fifth of the respondents (21.6%) were dissatisfied with the information acquired through digital reference service and communication, half of them were satisfied with the information they acquired through digital service. One-third of the respondents (32.9%) reported that they had problems communicating with reference service. Although the respondents had problems with digital reference service and communication, half of them were satisfied with the information they acquired through digital service. Figure 5 is a representation of the user satisfaction with the service.

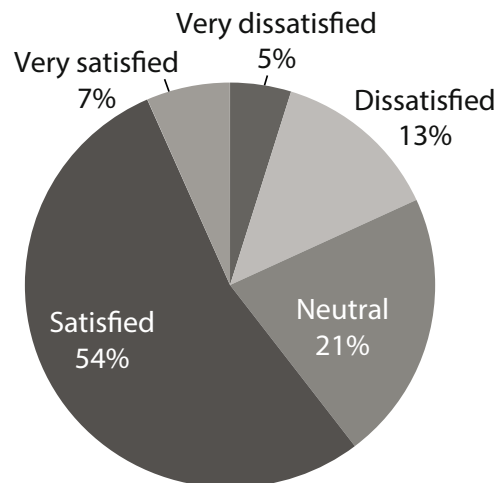


Figure 5: User satisfaction with the service

### Outcomes (Users' Needs Satisfaction)

Users' needs satisfaction by the face-to-face reference service was assessed on the following four aspects.

1. Whether reference librarians gave helpful information
2. Satisfaction with the information acquired through face-to-face reference service
3. Whether reference librarians gave useful information
4. Satisfaction with the information acquired through digital reference service

The findings showed that:

- Face-to-face reference service librarians gave helpful information
- The users reported that reference librarians were helpful (71.1%)
- The level of satisfaction with the information acquired through face-to-face was significant (61.3%)
- About 68.9% users did find information acquired through face-to-face reference service useful whereas 10.3% of users did not find the information useful.

- On the digital reference service, the levels of satisfaction and dissatisfaction were 57.4% and 21.5%, respectively. Users were less satisfied with digital reference service than the face-to-face service. Face-to-face reference librarians were considered helpful (71.1%) and 61.3% of respondents were satisfied with information acquired. Out of the total information received, 68.9% was reported to be useful. However, only about half of (57.4%) of the users were satisfied with information acquired through digital reference service. Figure 6 shows the percentage response of the understanding of the users on how to communicate with reference librarians versus helpfulness of the information received.

The level of outcomes in all the areas [discussed under Outcomes (Users' Needs Satisfaction)] was nearly the same. The respondents who agreed with statements relating to helpfulness, usefulness, and satisfaction were more than those who disagreed. It can be confirmed from Table 9 that the students were satisfied and found the information given to be both helpful and useful.

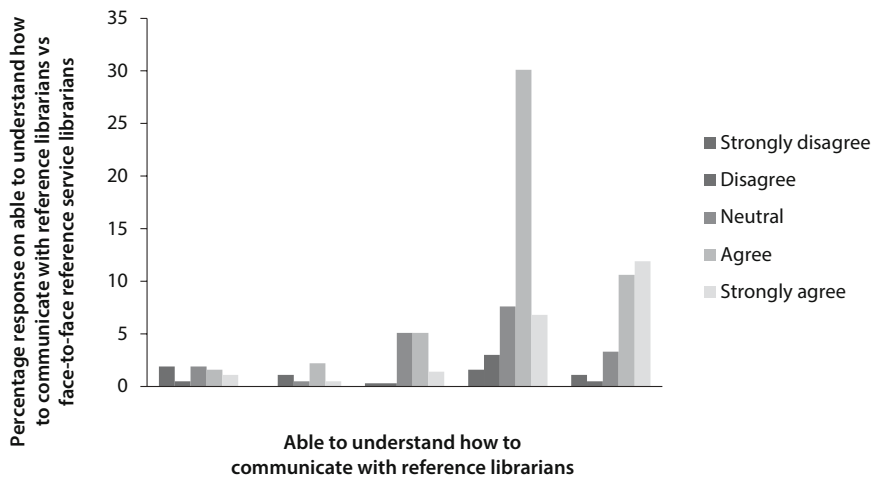


Figure 6: Communication with reference librarians versus helpfulness

**Table 9:** Usefulness, satisfaction, and helpfulness to users

	Useful	Percentage	Frequency	Percentage	Helpful	Percentage
Strongly disagree	12	32.3	18	5.3	18	4.8
Disagree	27	7.2	45	21.4	20	5.3
Neutral	79	20.8	81	21.4	70	18.7
Agree	203	53.2	174	46.0	186	49.7
Strongly agree	59	15.5	58	15.3	80	21.4
<b>Total</b>	<b>380</b>	<b>100</b>	<b>378</b>	<b>100</b>	<b>374</b>	<b>100</b>

### Overall User Satisfaction with the Service

On the basis of the levels of satisfaction or dissatisfaction, the respondents' likelihood of using the service in the future is enumerated here:

The level of likelihood of the students to use face-to-face reference service in the future was high (65.7%). However, about a quarter (23.8%) was unlikely to use service in the future. Only 10% of the students were not sure about using the service in the future. Majority (64%) of the students were likely to recommend the face-to-face reference service to their friends and colleagues. But one-fifth (19%) were unlikely or very unlikely to do so. Almost a similar proportion of the students was neutral.

The overall reference library user satisfaction was examined from three main perspectives: Overall satisfaction (68%), Likelihood of using the service in the future (65.7%), and Possibility of recommending the service to friends and colleagues (64%). The overall finding was that over 60% of the students were satisfied and a comparatively close number would use the

service in the future and even recommend it to their friends.

Assessing interaction service quality and overall satisfaction, librarians' willingness to help (46.4%) users and courteousness (45.7%) were not highly rated but the library users were satisfied with the service (61%). They were also likely to recommend the service to others (64%). The interaction service quality was scored lower than the level of satisfaction. However, between one-quarter to one-fifth of the respondents were not likely to use it in the future or recommend it to their friends.

The correlation coefficient between library user satisfaction with the service and the interaction service quality was found to be positively strong ( $r=0.61$ ). A strong correlation means that quality of service could explain 37.2% of the shared variance of the user satisfaction with service. This finding was not statistically significant at the '0.001 level' of significance.

In the case of the satisfaction with digital reference service, there were strong objections to the fact that they were satisfied with digital information service (Figure 7).

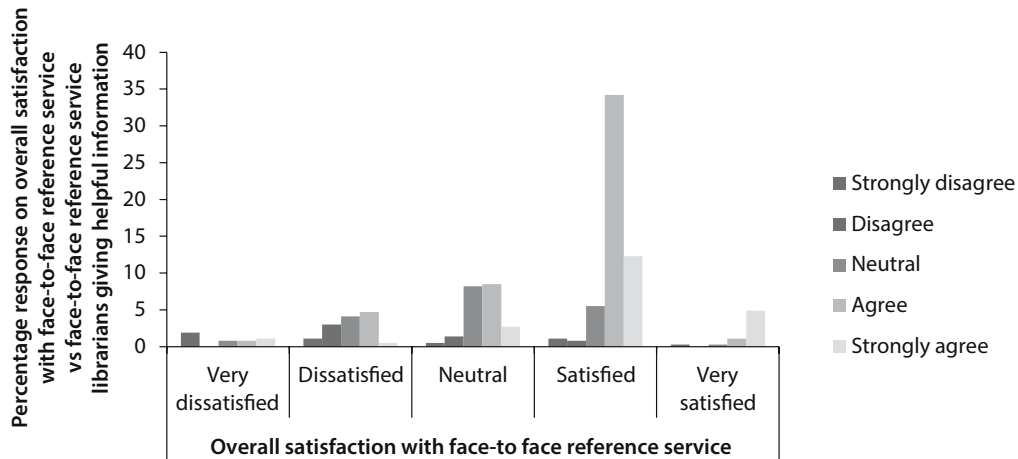


Figure 7: Overall satisfaction with reference service versus helpfulness of reference librarians

### Outcomes Versus User Satisfaction with the Service

An analysis of outcomes and user satisfaction among the schools showed that in the Humanities and Social Sciences, less than half (41%) were satisfied with the service whereas nearly one-third (33.3%) were dissatisfied. About 25.6% were neutral on this. The levels of outcome among the students of Humanities and Social Sciences were lower than the rest of the schools. Science and Technology (63.5%), Education (69.2%), Business Studies (58.9%), and others (73.9%) gave higher levels of satisfaction than Humanities and Social Sciences. More than half of the students from these schools were satisfied with the reference service.

One-fifth of Humanities and Social Sciences students found the service as unhelpful and one-third adjudged it as unsatisfactory. In addition, it is the only school that did find both helpfulness (46.2%) and satisfaction (41%) levels below 50%. It is worth mentioning that the levels of helpfulness and satisfaction were

nearly same in the case of rest of the schools. Although Education school students rated the level of helpfulness of face-to-face reference librarians to be very high (92.3%), however, the level of satisfaction was low (69.2%). The helpfulness level among Education students was 23.1 points higher than the satisfaction. The students from school of Business Studies rated the satisfaction level 14% points lower than the level of helpfulness. Science and Technology students rated both the levels of helpfulness and satisfaction almost equally. Majority of Education (71.8%) and Science and Technology students were satisfied (63.5%) with the face-to-face service. All students rated the level of reference librarians' helpfulness higher than their level of satisfaction.

Maximum of the students from the listed schools were relatively satisfied with the service, however, a significant proportion (33.3%) of the Humanities and Social Sciences were dissatisfied. Table 10 lists helpfulness and satisfaction of reference service utilized by schools.

**Table 10:** Helpfulness and satisfaction of reference service by schools

School	Unhelpful (%)	Helpful (%)	Satisfaction (%)	Dissatisfaction (%)
Humanities and Social Sciences	20.6	46.2	41.0	33.3
Science and Technology	13.5	64.9	63.5	16.3
Education	5.1	92.3	71.8	15.4
Business Studies	5.9	73.5	58.9	11.8
Others	8.6	80.4	73.9	12.8

Collectively, the dissatisfaction levels among students of all schools (except Humanities and Social Sciences) ranged between 11% and 16%. On the level of dissatisfaction, the Humanities and Social Sciences students were more than twice dissatisfied as compared to the students from other schools.

The overall level of satisfaction with the information acquired through face-to-face reference service was wide ranging. In this, 41% students of Humanities and Social Sciences, 63.5% of Science and Technology, 71.8% of Education, and 58.9% of Business Studies were satisfied with the information acquired. Again Education students experienced higher level of satisfaction than all the other schools.

About one-third (33.3%) of Humanities and Social Sciences students were dissatisfied with the information they received from face-to-face reference service. Among other schools, students of Science and Technology (16.3%), Education, (15.4%), and Business Studies (11.8%) were dissatisfied. The level of dissatisfaction among the students from the other schools was low as compared to the Humanities and Social Sciences students.

With an average of 70%, the overall rating of information given to students from face-to-face reference service was rated as useful, except for students of Science and Technology (64.9%), as given in Table 11.

**Table 11:** Usefulness of information given through face-to-face reference service

School	Useful	Not useful
Humanities and Social Sciences	69.2	5.1
Science and Technology	64.9	10.8
Education	76.2	14.3
Business Studies	70.6	5.8
Others	71.7	8.7

Schools that received the most useful information include Education (76.2%), Business Studies (70.6%), and others (71.7%). On the contrary, Science and Technology (64.9%) students received the least useful information. In most cases, very little information, received by students, was rated as not useful because it lied between 14.3% (Education) and 5.1% (Humanities and Social Sciences). Despite the fact that students from Education school were the most dissatisfied students among all schools, the information they received was found to be useful (69.2%).

Table 12 gives the overall satisfaction with the face-to-face reference service. Education (69%) and Science and Technology (63.5%) were the most satisfied schools in terms of information acquired through face-to-face reference service. The overall finding was such that the students of Humanities and Social sciences were the least satisfied (41%), followed by Business Studies students (58.9%). From the finding, less than half of the students of Humanities and Social Science were satisfied with information acquired.

### Likelihood of the Use of Face-to-face Reference Service in the Future

About one-third (33.4%) of Humanities and Social Sciences students were unlikely to use

the face-to-face reference service in the future. This percentage was comparatively close to the proportion of students (33.3%) who rated ‘overall dissatisfaction’ with the face-to-face reference service. Approximately 53.9% of the students, especially from the school of Humanities and Social Sciences were likely to use the face-to-face reference service in the future. A small proportion of 12.8% students (Humanities and Social Sciences) was not sure whether in the future they would use the service or not.

A high proportion of students (80.8%), in all other schools, was likely to use the reference service in the future in comparison with the students from Humanities and Social Sciences (53.3%). Similar pattern was observed in the case of Science and Technology (67.6%), Education (71.8%), Business Studies (70.6%), and others (70.8%). The ratings from the other schools were almost 20% points higher than Humanities and Social Sciences. One-third of the students in Humanities and Social Sciences (33.4%) and about one-fifth students of Science and Technology (25.7%), Education (18%), Business Studies (20.6%), and others (20.9%) were unlikely to use the reference service in the future.

The likelihood of the use of face-to-face reference service (with satisfaction) for acquiring information by various schools is summarized in Table 13.

**Table 12:** Overall satisfaction with the face-to-face reference service

School	Satisfied (%)	Dissatisfied (%)
Humanities and Social Sciences	41.0	33.3
Science and Technology	63.5	16.3
Education	69.0	15.4
Business Studies	58.9	11.8
Others	73.9	12.8

**Table 13:** Satisfaction and use of face-to-face reference service

School	Satisfied (%)	Dissatisfied (%)	Use: likely (%)	Use: unlikely (%)
Humanities and Social Sciences	43.6	25.6	53.9	33.4
Science and Technology	56.7	17.6	67.6	25.9
Education	77.0	15.4	71.8	18.0
Business Studies	55.9	14.7	70.6	20.6
Others	73.0	14.6	80.8	20.9

In can inferred from the table that in almost all cases the level of satisfaction was lower than the likelihood of the use of the service in the future. In the school of Education, both the likelihood of the use of face-to-face reference service in the future and the level of satisfaction are high. It can be noted that the likelihood of the use of face-to-face reference service (71.8%) in the future is higher than the level of satisfaction (77%). On the level of dissatisfaction and the unlikelihood of the use of face-to-face reference service in the future, the percentage of the users who are unlikely to use the reference service in the future is more than the dissatisfied users. The outcome of the analysis of face-to-face reference service is strongly correlated with the user overall

satisfaction ( $r=0.548$ ). This means that outcome helped to explain 33.6% of shared variance. There is a statistical significant relationship between user satisfaction with the service at the '0.001 level' of significance.

Comparing the usefulness of information acquired through face-to-face reference service and the likelihood of use in the future the percentage points were found to be very close (Table 14). Majority of the students found the information acquired through face-to-face interaction to be useful. The likelihood of use of service in the future was high except for the students of Humanities and Social Sciences. Only half of them (53.9%) are likely to use the service in the future.

**Table 14:** Usefulness of information versus likelihood of use of face-to-face reference service in the future

School	Useful (%)	Not useful (%)	Use: likely (%)	Use: unlikely (%)
Humanities and Social Sciences	69.2	5.1	53.9	33.4
Science and Technology	64.9	10.8	67.6	25.7
Education	76.2	14.3	71.8	18.0
Business Studies	70.6	5.8	70.6	20.6
Others	71.7	8.7	70.8	20.9

The level of usefulness of information provided did not seem to deter future use of the service. The results showed that usefulness of information correlated positively with likelihood of use. On further examination of the most critical variable that seemed to influence information seeking especially user satisfaction, interaction service quality was found to be important. Interaction service quality was assessed on the basis of librarians' helpfulness and courtesy. The reference service users considered reference librarians to be about 50% helpful and courteous. It is worth mentioning that interaction service quality has a strong positive correlation with satisfaction. The level of user satisfaction was lower than helpfulness. There was also a strong correlation coefficient between need satisfaction (outcome) and overall satisfaction. Need satisfaction was also strongly correlated with interaction service quality. Helpfulness and courtesy of reference librarians correlated strongly with need satisfaction. That might mean that though the provision of the answer to satisfy an information need is critical, users' perception of helpfulness and courtesy were equally important. The two variables also correlated strongly with overall satisfaction including likelihood of use of the service and recommendation to colleagues and friends.

### Values of Outcomes

Values of outcomes were assessed from the following three aspects:

1. It was desirable for information needs to be met through face-to-face reference service
2. It was very important for information to be met through reference service
3. It was valuable for information needs to be met through reference service

Value of expected outcome meant attractiveness of outcome to the postgraduate students. This largely depends on the context in which they utilize the reference service. They may be preparing for an examination or expanding their knowledge on a general topic.

On the value of information needs to be met through face-to-face reference service, about 65.3% agreed that it would be very valuable to fulfil their information needs through face-to-face reference service. Less than one-fifth (17.6%) responded negatively (disagreed). A comparatively close (64.7%) percentage to those who agreed that it would be very valuable (65.3%) to have their information needs met through face-to-face reference service reported that it was important for their information needs to be met through reference service. Contradictorily, one-third (29.4%) disagreed to it. An important proposition of this study is that face-to-face interaction is the most preferred mode of fulfilling information needs. Majority (68.7%) of the respondents agreed with this statement while about one-tenth (14.5%) were not in agreement with this. Postgraduate students reported that it was desirable (68.7%), valuable (65.3%), and important (64.7%) for their information needs to be met through face-to-face reference service. This service remains critical to students in Kenyatta University. Figure 8 shows the response on the value of outcomes met through face to face reference services.

In identifying the factors that influenced the process of information-seeking behaviour, correlation coefficient was evaluated and interpreted (Jiang 2013).

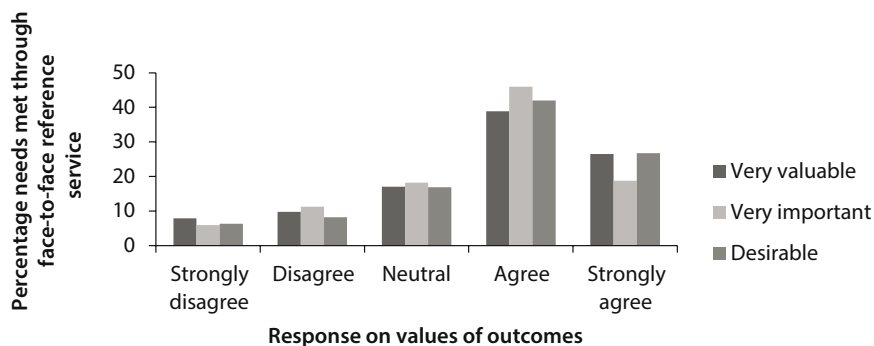
Correlation coefficient

+/-	0.10 to 0.29	=	Weak
+/-	0.30 to 0.49	=	Medium
+/=	0.50 to 1.00	=	Strong
	P Value	p≤	0.05

Three levels of correlation were found:

(i) strong, (ii) medium, and (iii) weak. Table 15 summarizes the correlations. The following three correlations were found to be strong:

1. Interaction service versus user satisfaction with the service
2. Outcomes versus user satisfaction
3. Outcomes versus interaction service quality



**Figure 8:** Outcomes to be met

Interaction between reference librarian and users can be measured not only on information provided but also by positive and negative impact of the reference librarian–user interaction from the users’ perspective. Gers and Seward found that behaviour has a strong impact on performance (Gers and Seward 1985). Library courtesy, interest and helpfulness are critical

in the success of reference service (Whitlach 1990). Library users tend to value ease of use and familiarity higher than the accuracy of information (Kim and Sin 2007). Consequently, librarians, perceived approachability and accessibility are critical in the interaction for service provision. Added to this are the librarians’ technical skills/competencies.

**Table 15:** Summary of correlations

S. No.	Variables	Correlation coefficient	Percentage	Relationship
1	Interaction service quality versus user satisfaction with service	0.61	37.20	Strong
2	Outcomes versus user satisfaction with service	0.58	33.64	Strong
3	Outcome versus interaction service quality	0.50		Strong
4	Performance/accomplishment of service by users versus outcomes	0.46	21.10	Medium
5	Performance/accomplishment of service by users versus value of outcomes	0.46	21.10	Medium
6	Performance/accomplishment of service by users versus interaction service quality	0.36	12.96	Medium
7	Effort by the users versus past experience	0.38	14.40	Medium
8	Performance/accomplishment of service by users versus user satisfaction	0.33	10.89	Medium
9	Expectancy of the users versus outcomes	0.32	10.24	Medium

*Contd...*

Table 15 *contd...*

S. No.	Variables	Correlation coefficient	Percentage	Relationship
10	Past experience versus interaction service quality	0.32	10.24	Medium
11	Effort by users versus interaction service quality	0.25	6.25	Weak
12	Value of outcome versus effort	0.25	6.25	Weak
13	Expectancy of users versus performance/ accomplishment of service by users	0.23	5.30	Weak
14	Expectancy of users versus user satisfaction with the service	0.24	5.76	Weak
15	Expectancy versus value of outcome	0.23	5.30	Weak
16	Expectancy versus value of outcome	0.22	5.30	Weak
17	Past experience versus outcome	0.21	4.41	Weak
18	Value of outcome versus user service satisfaction	0.14	1.96	Weak
19	Past experience versus performance/accomplishment of service by users	0.15	1.69	Weak
20	Effort versus performance/accomplishment of service by users	0.12	1.44	Weak
21	Past experience versus value of outcome	0.12	1.44	Weak
22	Expectancy versus effort	0.12	1.44	Weak

### Overall Correlations Among Cognitive Variables

Brindesi argued that libraries should compete with other information providers on user service quality and satisfaction (Brindesi 2013). User satisfaction is an attitude change resulting from the experience of using reference and information service. Such an experience includes library's response as perceived by the user. Quality of service should be interpreted from the users' perception including what the users believe they have received. The user service satisfaction includes, responsiveness, assurance, reliability, and empathy. Library service quality as perceived by users can enhance reference service usage (Tsia-ying Hsieh 2015). It is likely that the higher the quality of service, higher is the usage. Generally, interaction service quality has the strongest correlation with users' overall satisfaction. In this study, reference service was

considered as information consultation to help users to solve problems they encounter while seeking information in the library.

A correlation analysis showed that interaction service quality was strongly correlated to users' satisfaction. The principal objective of face-to-face reference service was to satisfy users' information needs. Satisfaction of needs was measured, in the study, as outcomes. A strong correlation between user information needs satisfaction (outcomes) and user's overall satisfaction was found. Outcomes could explain 33.64% of shared variance with users' overall satisfaction.

Outcome (need satisfaction) was also found to be strongly correlated to interaction service quality. It could explain 25% of shared variance between the two variables. Information need, in this case, is seen as a cognitive and affective state brought about when an individual realizes that he/she is not comfortable with his/her

current state of knowledge on an issue. It is an 'Anomalous State of Knowledge' as described by Weiller (Weiller 2005). Users are not just interested in the answers, they are equally interested in the environment (helpfulness and courtesy) in which the answers are given. What happens during staff–student encounter and what they value is critical. During such encounters librarians can hold rapport with users and teach them how to frame their questions (Masinde 2016).

The three variables of interaction service quality, outcomes (needs satisfaction), and overall user satisfaction with the service have strong influence in the information-seeking process. Users' performance/accomplishment of service (users' ability to communicate with reference librarian and to use digital reference service) correlated positively with outcomes. Information (needs satisfaction) was found to have a medium positive correlation with many outcomes, values, service quality, and user satisfaction.

Over 40% of the students had problems communicating with reference librarians. This could be interpreted to mean that they were not able to explain what they were looking for. Kulthau has summarized the challenges as 'uncertainty principle' which is both a cognitive and affective state (Kulthau 2004). In this state, users are unclear about the topic or information they may be looking for. Librarians need to prioritize assisting such students. Dervin argued that it is important on the behalf of librarians to understand the processes people go through in information seeking (Dervin 2003). Information needs can best be satisfied by understanding the process that each individual user goes through in experiencing a gap and trying to resolve it. Greenberg felt that because sometimes users cannot easily express what they don't know or missing, their submission to reference librarians cannot best represent their information needs (Greenberg 2013). Reference librarians should focus on how the problem developed by paying attention to situational elements of need (Tambala 2010). This means that reference

librarians should appreciate that users seek information because they have a problem to solve. For this, a cognitive approach should be followed. This demands that librarians hold reference transaction in an environment that users would consider helpful and courteous. In such a situation users would discuss their problem with ease and trust.

As summarized in Table 15, seven groups of relations were found to have a medium positive correlation, ranging from 0.46 of the performance/accomplishment of service by users versus outcomes and value of outcomes to 0.32 on the past experience versus interaction service quality.

Users' performance/accomplishment with service, as assessed by ease of use of digital reference service and communicating with reference librarian correlated positively with outcomes, value of outcome, interaction service quality, past experience, and satisfaction. Among the variables with medium positive correlation, performance/accomplishment by users seems to affect and correlate positively to make information-seeking variables. Yet from the findings, it can be established that majority users faced serious challenges using digital reference service. Indeed, their level of satisfaction with digital reference service was 57.4%, meaning 42.6% were dissatisfied. Information personnel ought to ensure that such group of users become actual users. The reference service needs to develop training strategies that can reduce the challenges users face in using digital reference service. Different strategies should be developed to empower users with appropriate information literacy skills. An important approach would be an embedded programme which can be mounted jointly by the faculty and the reference service. This would be an integrated initiative offered at the appropriate time during course work focused on information literacy competency skills. The embedded information literacy programme should be assessed and the marks earned should contribute to the students' overall grades (Ary, Jacobs, Sorensen 2010).

Past experience was found to have a medium positive correlation with the effort users expended on information seeking and interaction service quality. Past experience had 0.38 correlation coefficient of shared variance with effort. This meant that 14.4% of shared variance could be explained. Equally, past experience had a 0.32 correlation coefficient of shared variance with interaction service quality.

Past experience was also found to have a weak correlation coefficient with user satisfaction with service 0.28 of shared variance. This meant, it could explain 7.84% of shared variance. Outcome was also found to have a weak correlation coefficient with past experience. It was found that it had 0.21 correlation coefficient, meaning it could explain 4.41% of shared variance other variables that correlated positively with past experience were performance/ accomplishment of service by users and value of outcomes.

Success of a reference service can be measured not only on the basis of the information provided but also by the positive or negative interaction between reference service personnel and users. Such a perception observed by the users could be a major determiner of success or failure. That connection was established by Seward (Seward 1985) who found that “behaviours have a strong influence on performance”. Saxton had a similar conclusion that “Interaction correlates highly to a successful reference transaction (Saxton 2002).” Conrad has confirmed in his studies that users’ experience would affect the future use of the service. Similarly, the findings of the current study indicate that past experience will influence the future use in the efforts users will expend in information seeking (Conrad 2014).

## Conclusion and Recommendations

This study examined the cognitive attributes which when combined together can drive and trigger information-seeking behaviour prior to consulting a librarian. Cognitive information

seeking-behaviour can be considered as an approach on how an individual applies his/her mental models of the world to process information seeking. The focus was user-covered and used a cognitive motivation theory to explain information seeking.

Seekers of information have choices of where to seek the information they require. That means that to fulfil their information needs, there is a decision-making process with which they go through while experiencing a need to solve a problem. Understanding that process can help libraries to:

1. Predict the likelihood of being consulted in the future by users
2. Design a system that would be user-friendly during their problem-solving time.

The Expectancy Theory can explain information-seeking process as driven by cognitive factors. It is based on the fact that people want to maximize satisfaction and minimize dissatisfaction. Users’ perceptions and expectations are critical in decision-making to seek information. These are mental processes which are formed as they interact with the reference library environment.

There are crucial cognitive factors that influence information-seeking process prior to making contact with reference librarians. The strongest factors include interaction service quality, outcomes (needs satisfaction), overall satisfaction of service, users’ competencies in performing a service, expectancies, and past experience. These are user experiences which form the basis for their mental models.

A very important implication of this study is that there is more to user satisfaction than just giving the right information. In other words, the environment in which a need is satisfied is also important. A library–user experience is highly influential in future use of the library as the library could become the place of choice for information seeking. The Kenyatta University, Post-modern Library should organize the services

such that users form a great positive experience that may drive them to avail the services in future.

In the study, the cognitive factors (mental models) that could influence students' use of the library were established. These factors can be altered, shaped, and developed. This can be accomplished through appropriate information literacy programmes.

Reference library personnel interaction with users has a determining influence on users' probability of approaching the services in future. There is a need for the library to train librarians on user-centred systems. These include improving their competencies in handling resources, users, and subject knowledge.

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