Assessing students' perceptions of ease-of-use and satisfaction on mobile library website: a private university perspective in Bangladesh

Md. Maidul Islam

Lecturer

Department of Information Science and Library Management
Faculty of Arts, University of Dhaka, Dhaka-1000, Bangladesh
Email: maidul528du@gmail.com

Contents…….

Introduction;
Objectives of the study;
Background of the study;
Mobile phone in Bangladesh;
Mobile application of LIS services;
Methodology;
Results;
Discussion and recommendations; and
Conclusion.

Introduction

In the era of enhanced mobile communication technologies, vast amount of changes are generated in facilitating communication and the transfer of information (Steenderen, 2002). Libraries are mastering the mobile web to bring a new set of services (Kroski, 2008). For this, new means of communication practices are necessary to keep in touch with library users.

This devices has made access to information very convenient and timely to the users from the comfort of their own home, office and from where ever they are!

Objectives of the study…

- **The main aim is to examine BRAC University (BRACU) students' perceptions of ease-of-use and their satisfaction with the mobile library website.**

The objectives are to:

- explore the nature and utilization of mobile library website in the educational environment among students;

- identify the demographic characteristics of the students using BRACU mobile library website;

- examine students' perceptions of ease-of-use in terms of terminology clarity, screen design, navigation, learning and their satisfaction with BRACU mobile library website;

Objectives of the study

- examine the effect of students' demographic characteristics such as gender and age, and their individual differences such as experience in using mobile, internet and the mobile website on their perceptions of usability of BRACU mobile library website; and

- suggest some heuristic guidelines for the design of library's mobile interface.
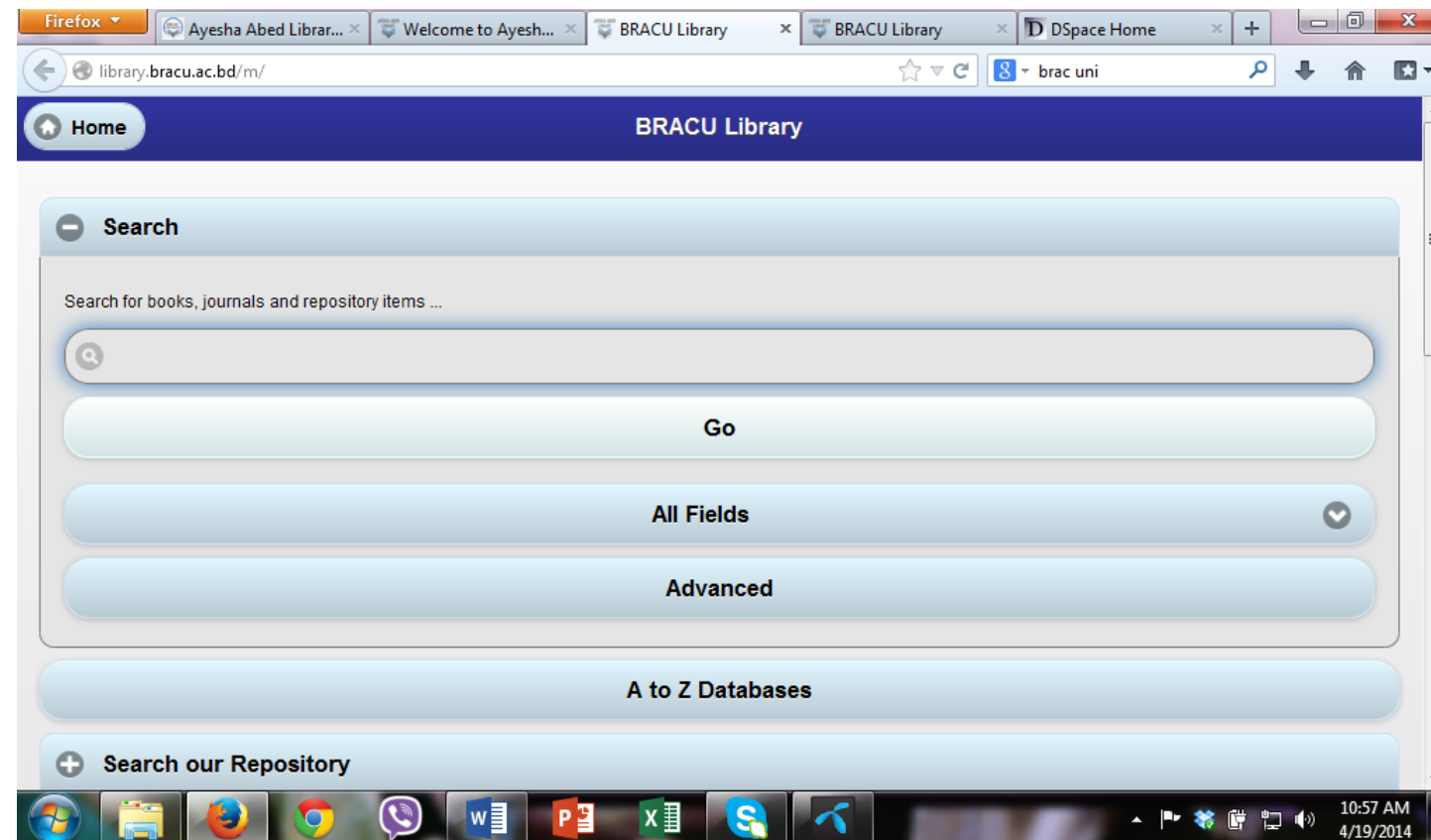
Background of the study…

The Library at BRAC University aims to become a world-class Knowledge Resource Centre and provide innovative new services and a wider collection of books (30,000+) and resources (IR=2500+ and huge collection of online databases from different publishers) to the teaching, learning and research communities, using latest technological developments of the 21st century. The development, organization and maintenance of archives in multiple locations; access to world class resources; personalized assistance in the use of library and information resources; and instruction on research strategies and tools have made this one of the richest libraries in the country.
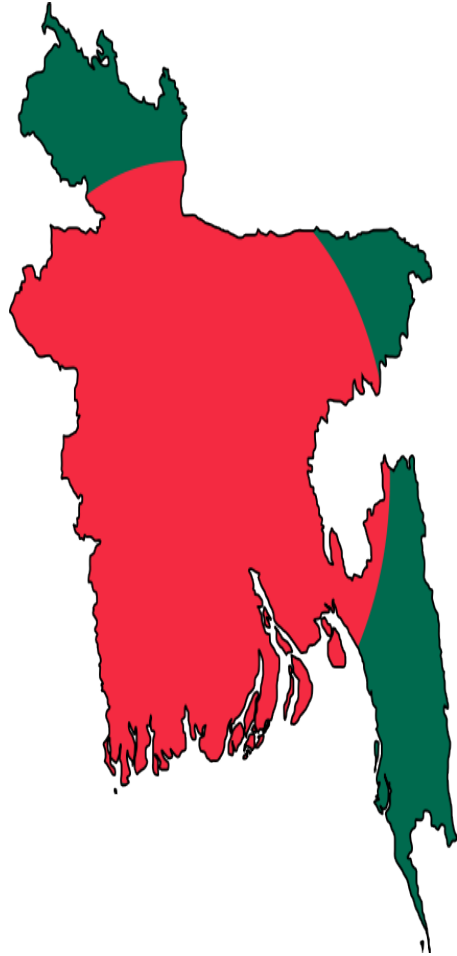
Background of the study

The Library's mission is to provide comprehensive resources and services in support of the research, teaching, and learning needs of the University community. Develop a world-class Knowledge Resource Centre and provide innovative new services and collections to the teaching, learning and research communities, using latest technological developments of 21st century. **BRAC University Library introduced mobile website on April 2013.**

BRACU Mobile Library Website

BRACU mobile library website is available at:

http://library.bracu.ac.bd/m/

Bangladesh : A Brief Description

Name:	People's Republic of Bangladesh.
Capital:	Dhaka
Location:	Southern Asia, sharing border by Bay of Bengal, India and Myanmar.
Area:	143,998 sq km
Population :	**15,2518015 (16-07-2012)**
Literacy:	**51.8%**
Language:	Most of the people speak in Bengali (However, English is widely spoken and used)
Religions:	89.5 % Muslim of the total population , others are Hindu, Buddhists, Christians and others.
Independence:	16 December 1971 (from West Pakistan)
Economy:	Agrarian but readymade garments, textile, fisheries, jute products, pharmaceuticals, tea and leather goods are also major industries.
Natural resources:	Natural gas, arable land, timber, coal

Mobile phone in Bangladesh

Bangladesh is one of the few countries in the world that can guarantee each one of its residents can get a cellphone signal - no matter where they are in the country with a population of over 150 million (BBS, 2012).

 is the first cellular company in Bangladesh started operation in 1996.

Continued…..

GrameenPhone (Widely known as GP) is the second operator that start their operations in 1997. It is a joint venture enterprise between Telenor and Grameen Telecom Corporation, a non-profit sister concern of the internationally acclaimed microfinance organization and community development bank name as 'Grameen Bank.'

In **2006**, first Bangladeshi **Professor Muhammad Younus** and **Grameen Bank** received the Nobel Peace Prize for the economic and social development. PalliPhone (Rural phone, a service of grameenphone for the rural people) was the first mobile tools that reached to the rural women in Bangladesh.

Continued …..

The total number of Mobile Phone subscribers now has reached 115.240 million at the end of March 2014 (BTRC, 2014).

At present, there are six mobile phone operators are offering mobile phone services in Bangladesh. There name, subscribers are presented in the following:

Mobile phone operators and users in Bangladesh

SL No	Operators	Subscribers (in million)
1	Grameen Phone Ltd. (GP)	48.683
2	Banglalink Digital Communications Limited	29.366
3	Robi Axiata Limited (Robi)	23.936
4	Airtel Bangladesh Limited (Airtel)	8.408
5	Pacific Bangladesh Telecom Limited (Citycell)	1.414
6	Teletalk Bangladesh Ltd. (Teletalk)	3.434
Total		**115.240**

Continued …..

Presently, in Bangladesh, 3G service is available from all the operators.

Mobile application on LIS services

❖ Wireless technology has the potential to offer many new possibilities for accessing information from online catalogues, online databases, the internet and virtual libraries (Karim, Darus & Hussin, 2006)

❖ Today, the convergence of mobile phones and the internet through the WAP standard presents libraries with a real opportunity to deploy wireless phone technology to manage their operations for the following services……

Continued ……….

❖ checking records of books borrowed;

❖ getting alerts on overdue books;

❖ getting alerts on outstanding fines;

❖ receiving reminders to return library items that will be due soon;

❖ renewing library items;

❖ reference enquiry services;

❖ receiving text alerts to new resources on the library web site;

Continued ……….

❖ getting alert on library event information;

❖ getting information from the library opac/database; and

❖ contacting librarian for help.

Currently, libraries are looking for ways to communicate with their users in such an effective manner. Although, the applications are limited to notification, very few libraries in Bangladesh are making the effort to use the wireless application services for such purposes.
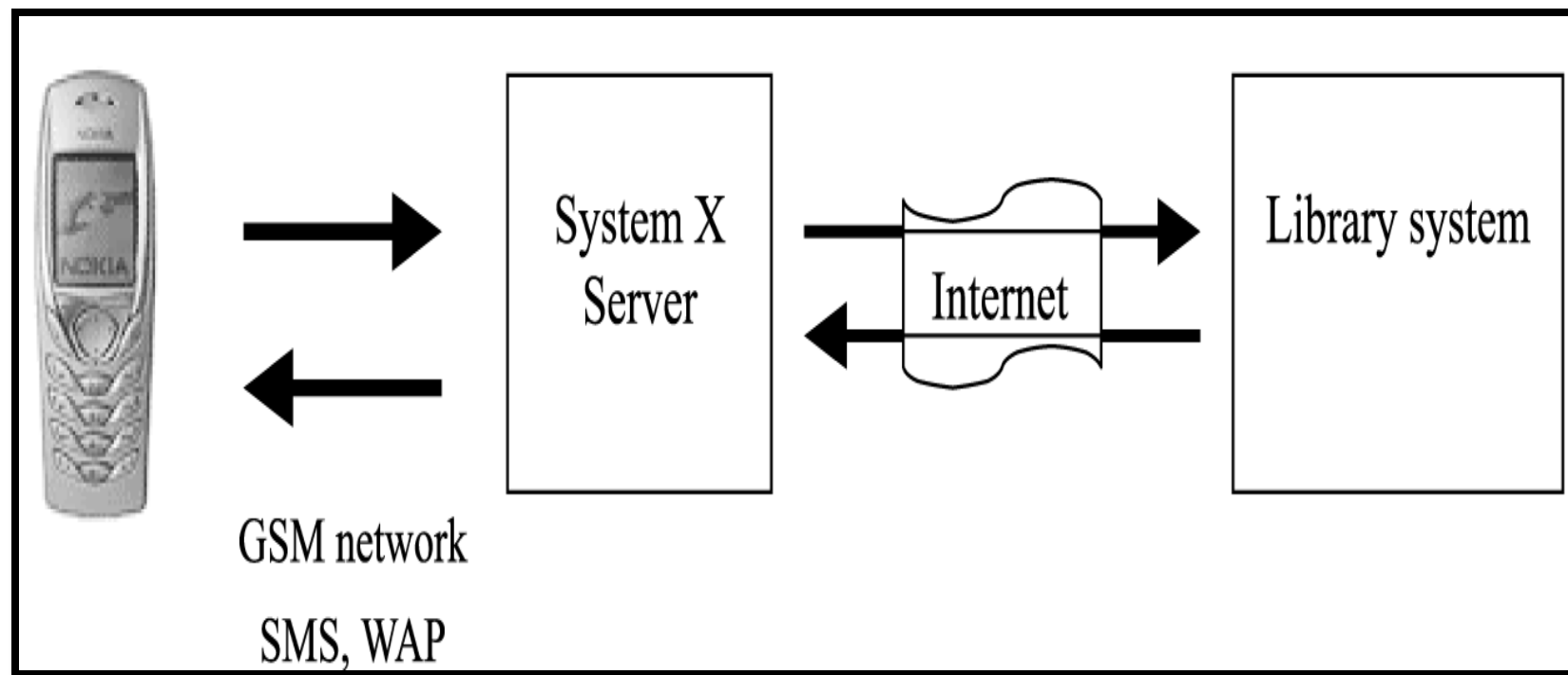
Continued ……….


Fig: An outline of system X architecture

Continued ....

❖Wireless application in library services can be established through an infrastructure that integrates the library systems and databases, through an application system that allows for information to be processed and delivered to a smaller device such as a mobile phone unit. **Before offering this service, the library should list their subject and assign code against each subject and provide the code to the users.**
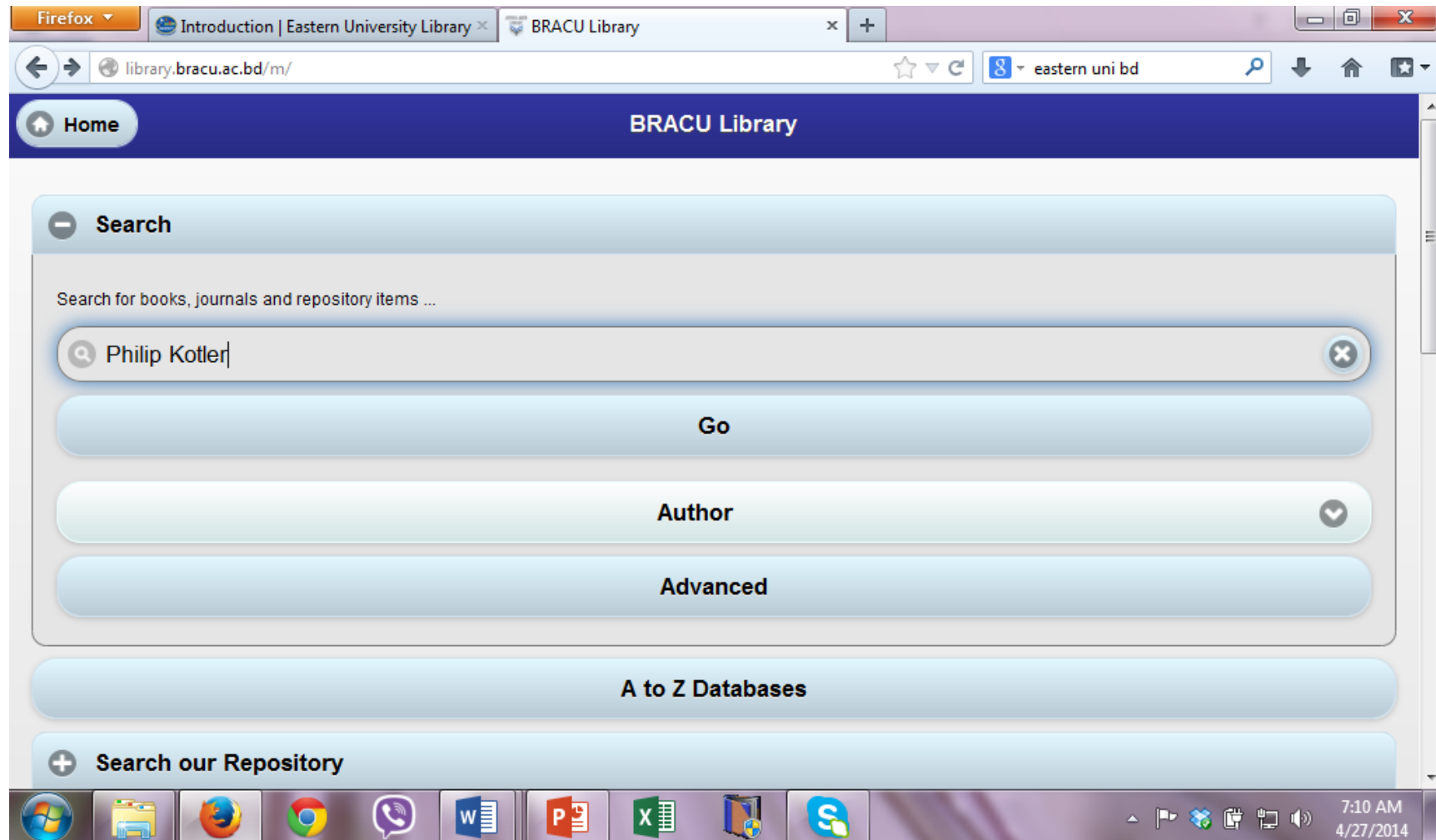
Homepage of BRACU mobile library website
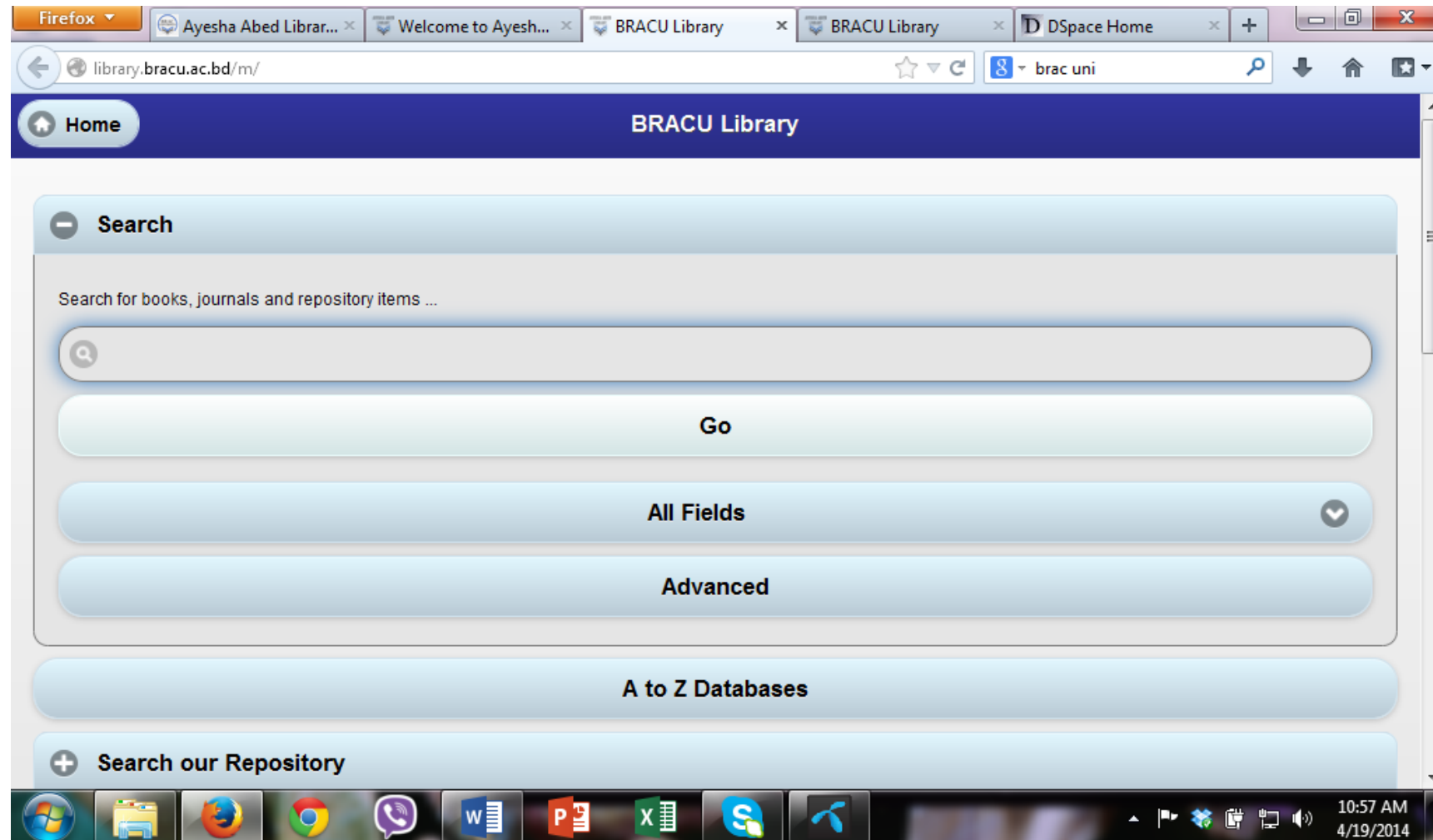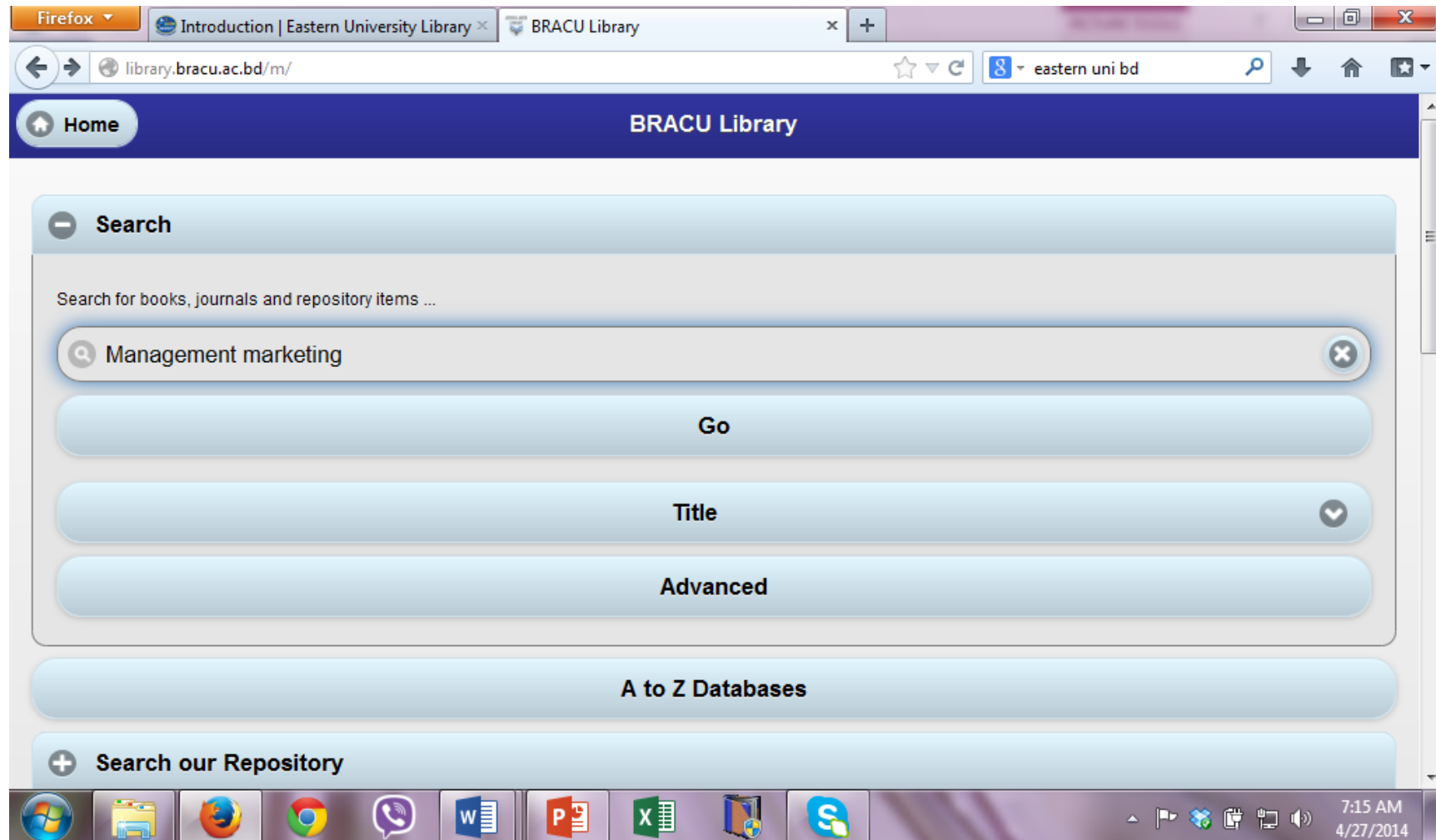
Search fields of BRACU mobile library website
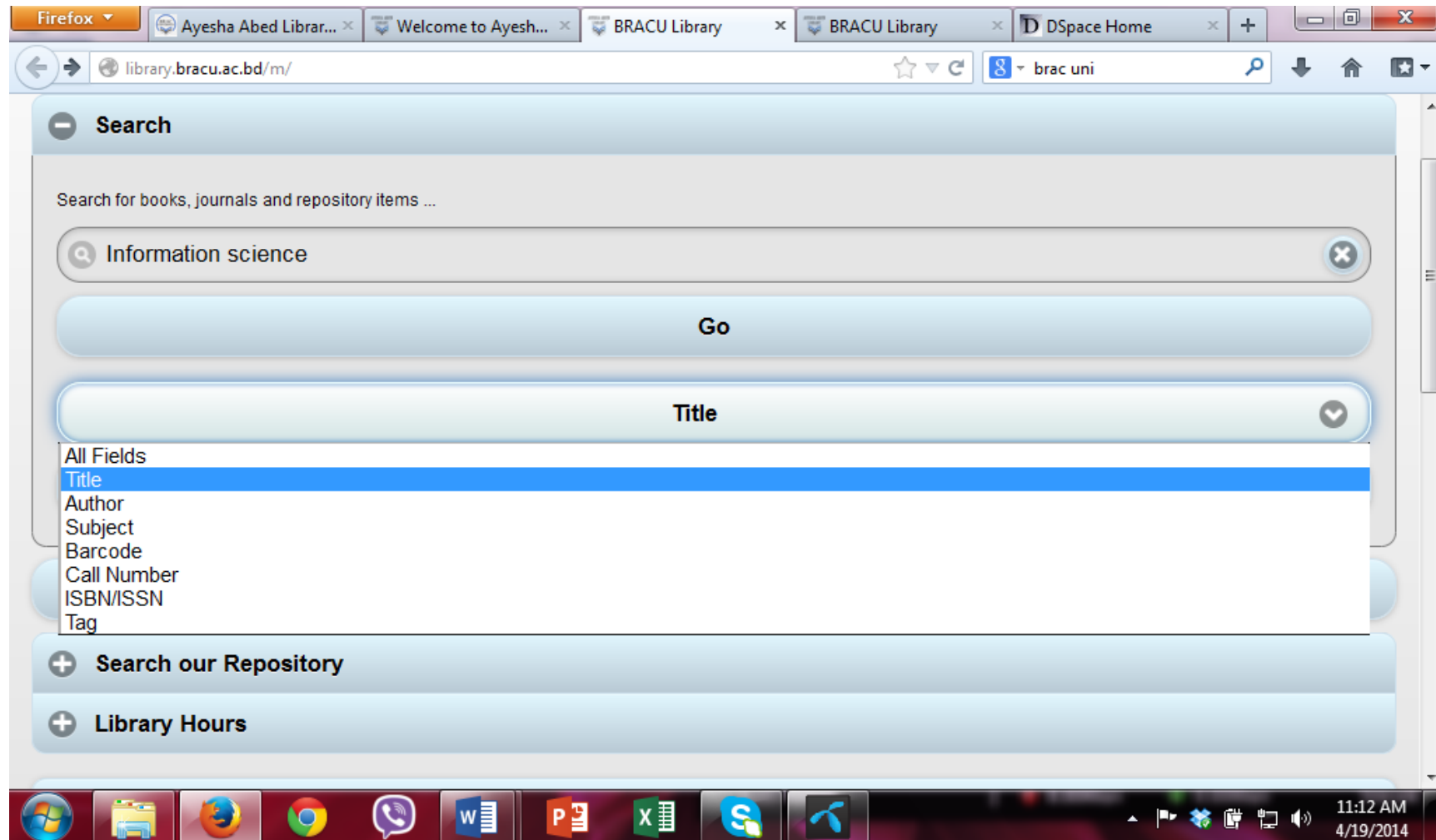
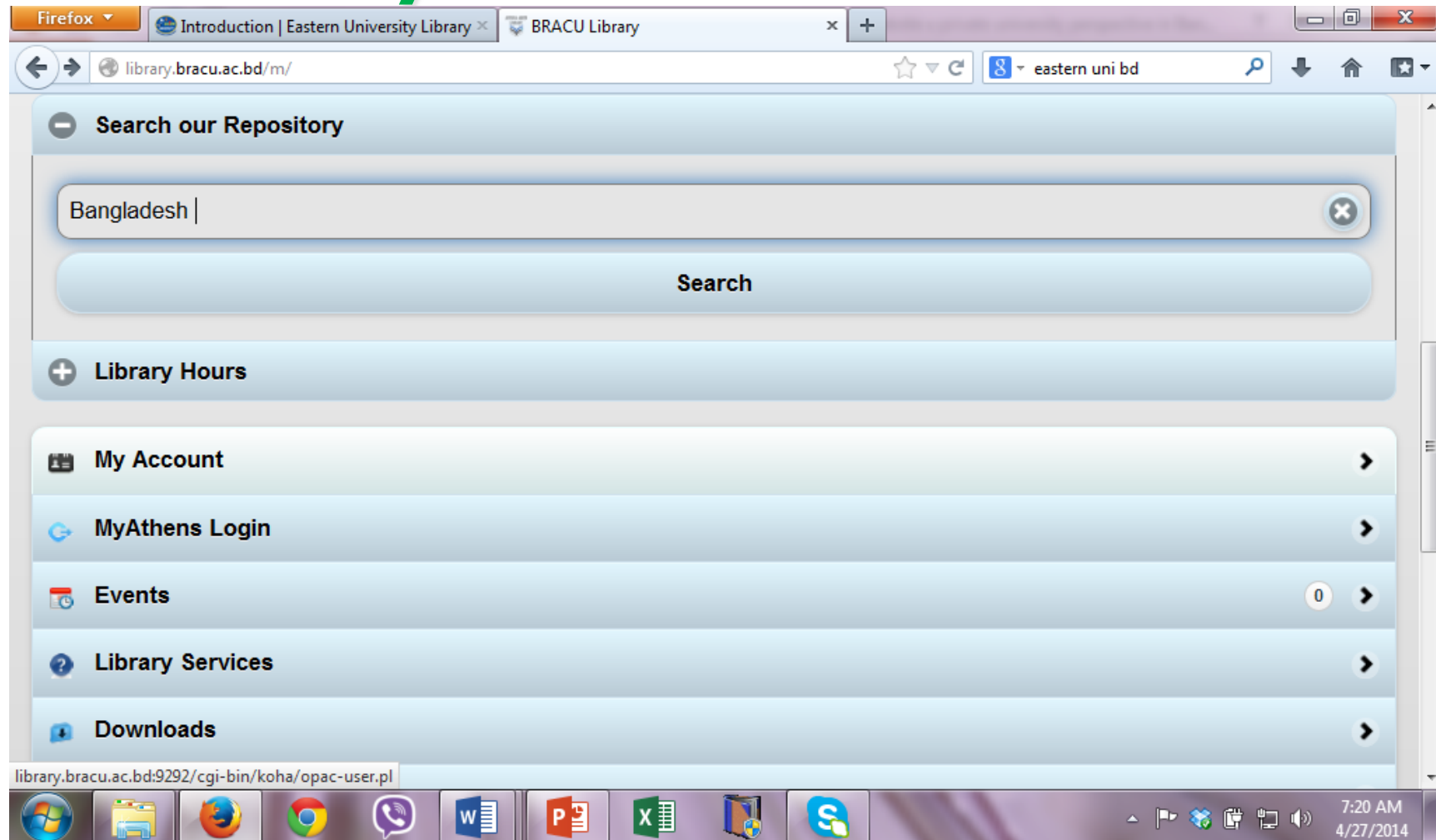# Author search of BRACU mobile library website

Author search results of BRACU mobile library website

Title search of BRACU mobile library website

BRACU Institutional Repository search of mobile library website

A-Z Database of BRACU mobile library website
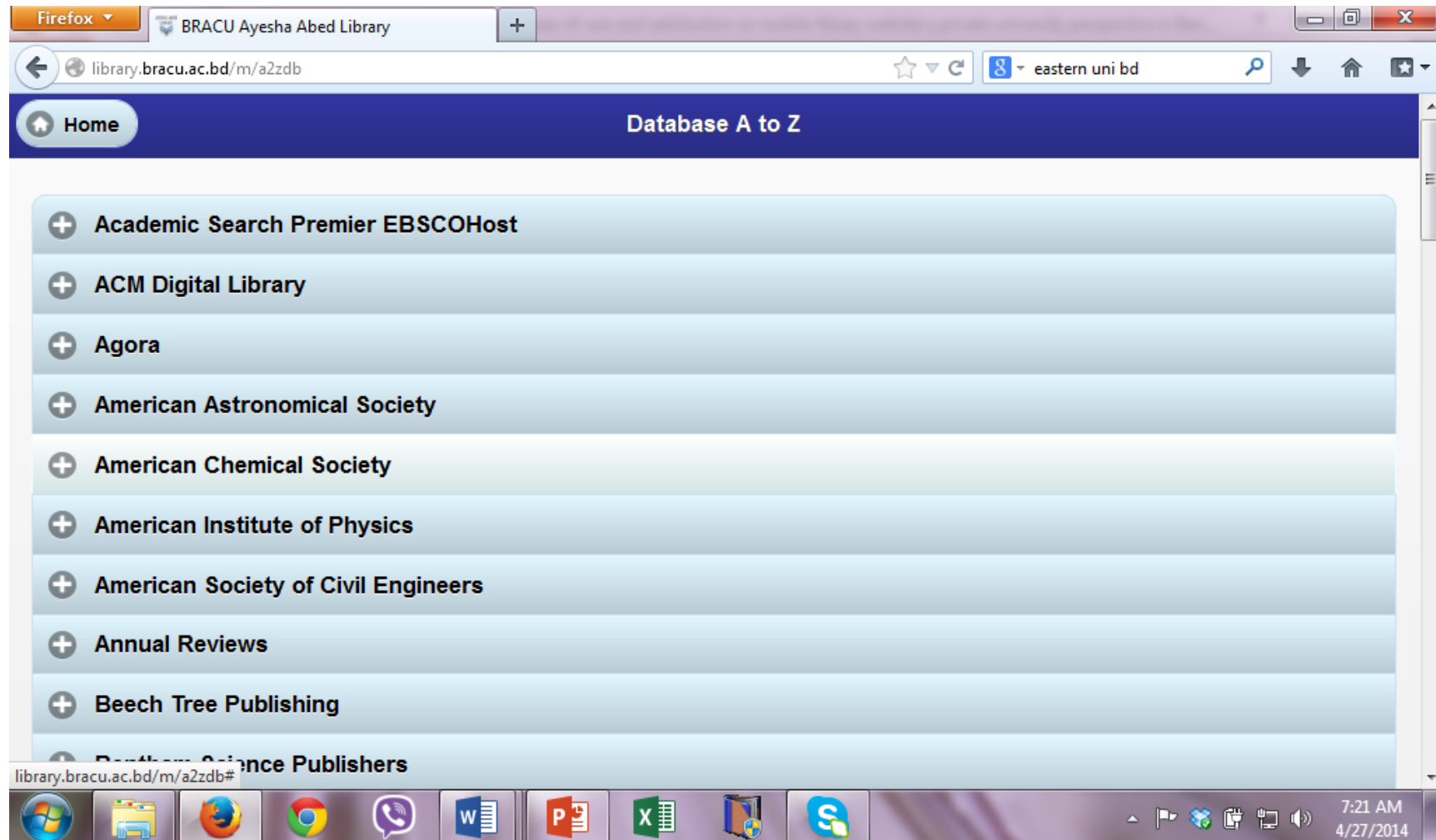
Methodology

- **Population and sample**

The study was conducted on the students of BRAC University. The data from the study was gathered from the undergraduate students from 9 departments. The total numbers 131 students of these 9 departments were considered as the research population.

Measurement and data collection

❖ The study used a survey questionnaire for the purpose of data collection. For this survey, in early January 2014, the students of 9 departments were contacted in their scheduled classes and given an explanation of the study.

❖ To maximize the response rate, students were advised that their responses would be completely anonymous and the data would only be used for the purposes of this study.

Measurement and data collection

A printed version of questionnaire was distributed in their class period separately. The data collection for this study began in January 2014 and continued through last week of February, 2014. Out of these 150 questionnaires, 131 were returned, giving a response rate of 87.33%. Few responses that were either incomplete or contained skipped answers were dropped from the analysis.

Continued…

❖ The questionnaire was pre-tested among good number of the students.

❖   The data collected were analyzed dominantly using descriptive statistical analysis. The findings were presented in tables, percentages and frequency distributions.

❖ The Statistical Package for Social Sciences (SPSS) was used for this purpose. A few inferential statistics were also performed to find out the relationships between variables.

Results

- A total of 131 students took part in this study. Among them 76 (58.02 percent) were male and 55 (41.98 percent) were female. **This suggests a balance between male and female students as respondents for this survey.** The age distribution of respondents is shown in Table 1. The largest group of students (61, 46.56 percent) was comprised of those in the age group of 21-25 years. The smallest group of students (2, 1.53 percent) was age group of 30+ years.

Table 1: Age group by gender

Age	Male		Female		Total	
	n	%	*n*	%	*n*	%
15-20 years	29	22.14	26	19.85	55	41.98
21-25 years	38	29.01	23	17.56	61	46.56
26-30 years	8	6.11	5	3.82	13	9.92
30+ years	1	0.76	1	0.76	2	1.53
Total	**76**	**58.02**	**55**	**41.98**	**131**	**100**

Department of the students

- Out of 131 students, 15 (11.45 percent) were studying in the first year, 30 (22.90 percent) were studying in the second year, 44 (33.59 percent) were in the third year, 79 (28.83 percent) were studying in the fourth year (Table 2). The lowest responses were from the students of sociology department (11, 8.40 percent). The highest responses were from the students of computer science and engineering department (20, 15.27 percent).

Table 2: Department by academic year

Department	1st year	2nd year	3rd year	4th year	Total
Computer Science and Engineering	2	6	6	6	20
Business Administration	2	4	7	5	18
Electrical and Electronic Engineering	3	4	3	5	15
Sociology	1	1	4	5	11
English and Humanities	0	5	3	4	12
Law	2	3	5	4	14
Architecture	3	3	5	3	14
Economics and Social Science	2	2	3	5	12
Pharmacy	0	2	8	5	15
Total	**15**	**30**	**44**	**42**	**131**

Experience of mobile usage

Table 3 illustrates respondents' experience in using mobile phones. **The results suggest that the largest group of students had three to four years of mobile experience.** A moderate number of students had five to six year of mobile experience. A few students had more than ten years of mobile experience. In total, only three students indicated that they had less than one year of mobile experience.

Table 3: Experience of mobile use by gender

Mobile experience	Male		Female		Total	
	n	%	*n*	%	*n*	%
Less than one year	2	1.53	1	0.76	3	2.29
1-2 years	4	3.05	5	3.82	9	6.87
2-3 years	10	7.63	8	6.11	18	13.74
3-4 years	11	8.40	11	8.40	22	16.79
4-5 years	8	6.11	7	5.34	15	11.45
5-6 years	13	9.92	7	5.34	20	15.27
6-7 years	7	5.34	8	6.11	15	11.45
7-8 years	9	6.87	5	3.82	14	10.69
8-9 years	5	3.82	0	0.00	5	3.82
9-10 years	3	2.29	0	0.00	3	2.29
More than 10 years	4	3.05	3	2.29	7	5.34
Total	**76**	**58.02**	**55**	**41.98**	**131**	**100**

Figure 1: Mobile phone use by gender

Figure 1: Mobile phone use by gender

55 — Female
76 — Male

Male
Female
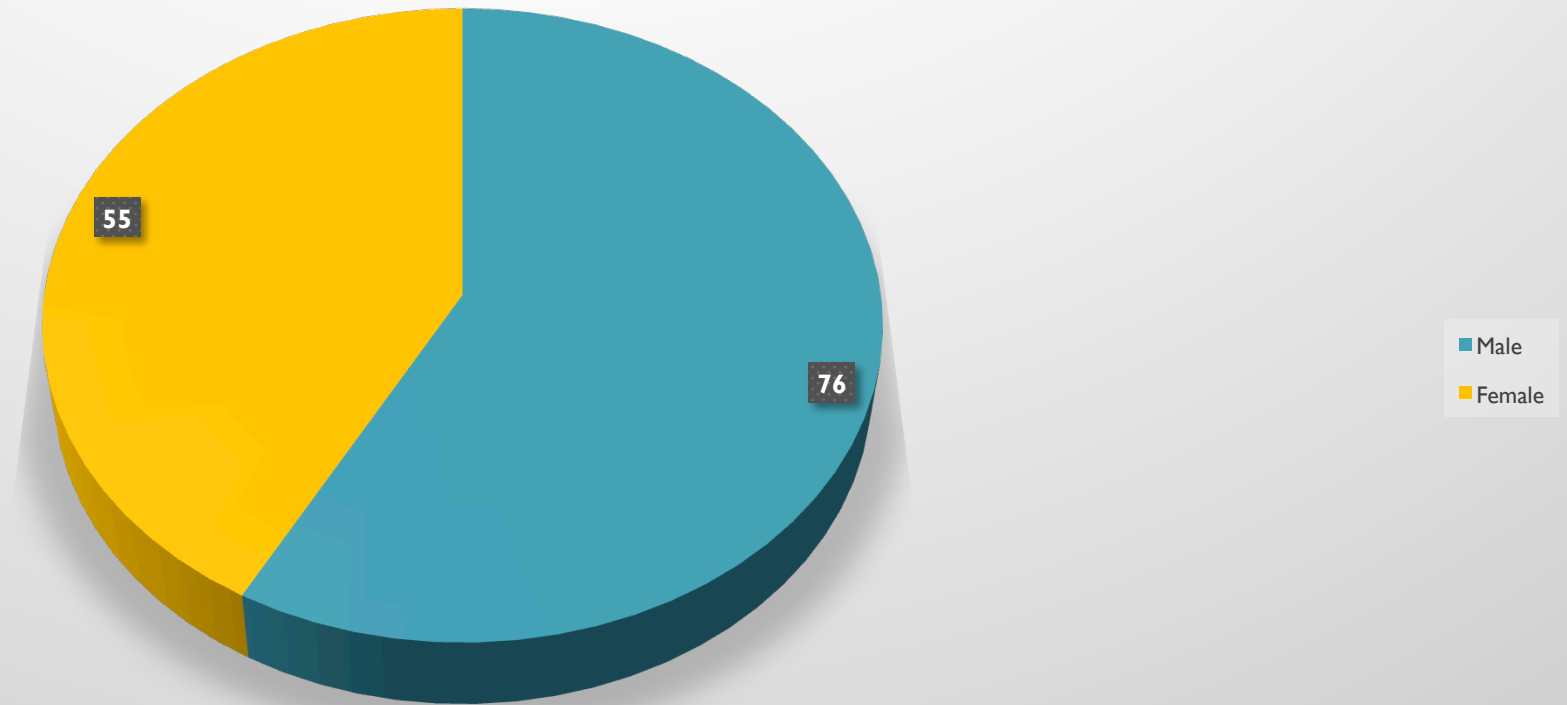
Tools used for internet use

Table 4 shows the tools for using internet. **A total number of students use mobile phone (131, 100 percent) for using internet.** Laptop and desktop were used 93 (70.77 percent) and 90 (68.70 percent) respectively. Only 27 (20.61 percent) students used the PDA for internet.

Table 4: Tools used for internet use (multiple)

Tools for using internet	Male		Female		Total	
	n	%	*n*	%	*n*	%
Mobile	76	58.02	55	41.98	131	100
Laptop	54	41.22	39	29.77	93	70.99
Desktop	56	42.75	34	25.95	90	68.70
iPad	16	12.21	21	16.03	37	28.24
PDA	12	9.16	15	11.45	27	20.61
Netbook	33	25.19	28	21.37	61	46.56

Figure 2: Use of internet by gender

Figure 2: Use of internet by gender

Female 42%

Male 58%

Male
Female
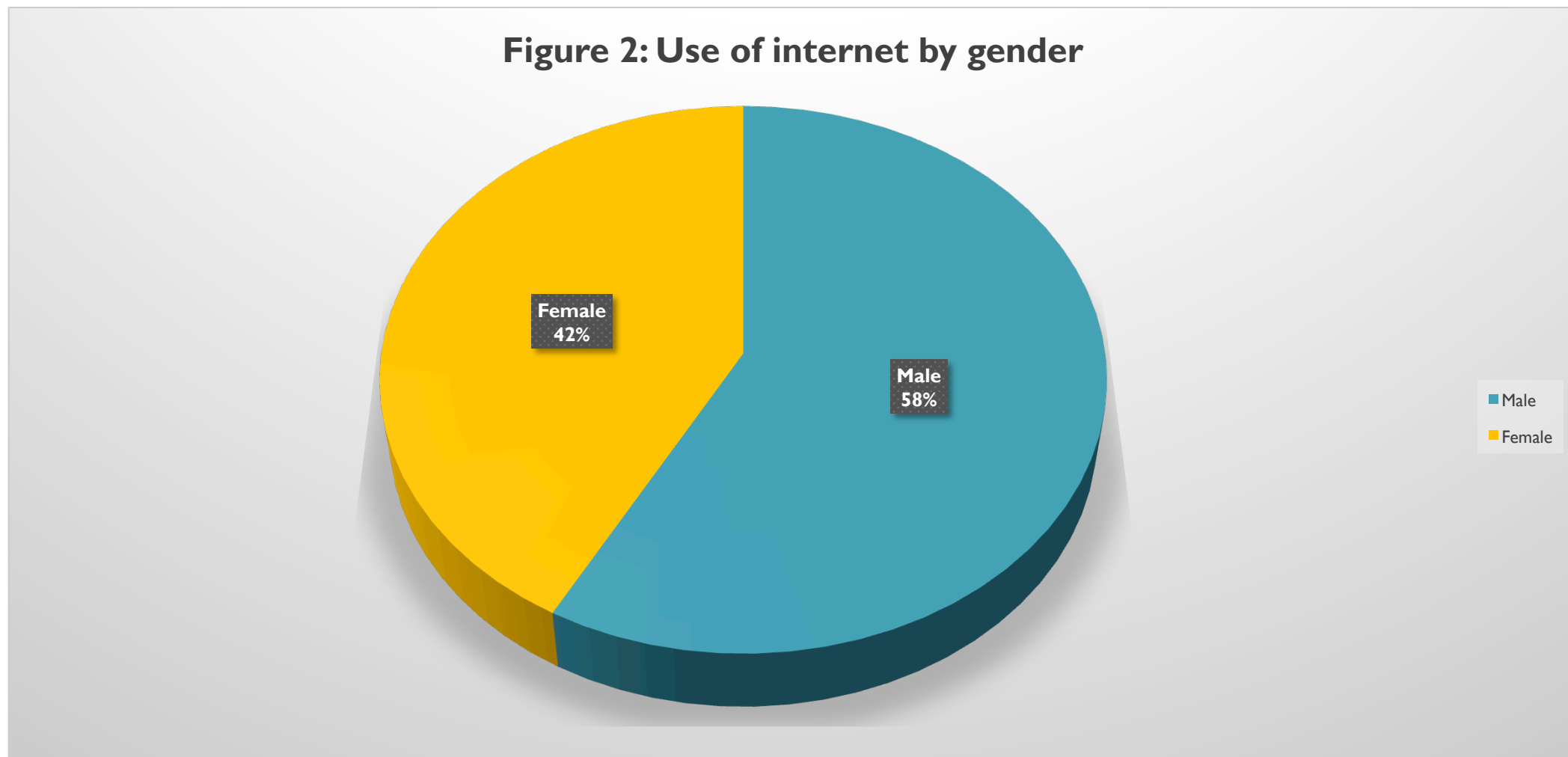
Frequency of internet use on mobile

The frequency of internet use on mobile varies among students. **Table 5 shows that the largest group of students used internet frequently.** A significant proportion of students used internet on a few times every hour or at least once an hour basis, with 8 students indicating that they used internet at least twice a day.

Table 5: Frequency of internet use on mobile by gender

Frequency of internet use on mobile	Male		Female		Total	
	n	%	*n*	%	*n*	%
Frequently	30	22.90	16	12.21	46	35.11
A few times every hour	10	7.63	8	6.11	18	13.74
At least once a hour	17	12.98	10	7.63	27	20.61
At least twice a day	8	6.11	8	6.11	16	12.21
At least once a day	11	8.40	13	9.92	24	18.32
Total	**76**	**58.02**	**55**	**41.98**	**131**	**100**

Figure 3: Mobile internet is useful for academic purposes
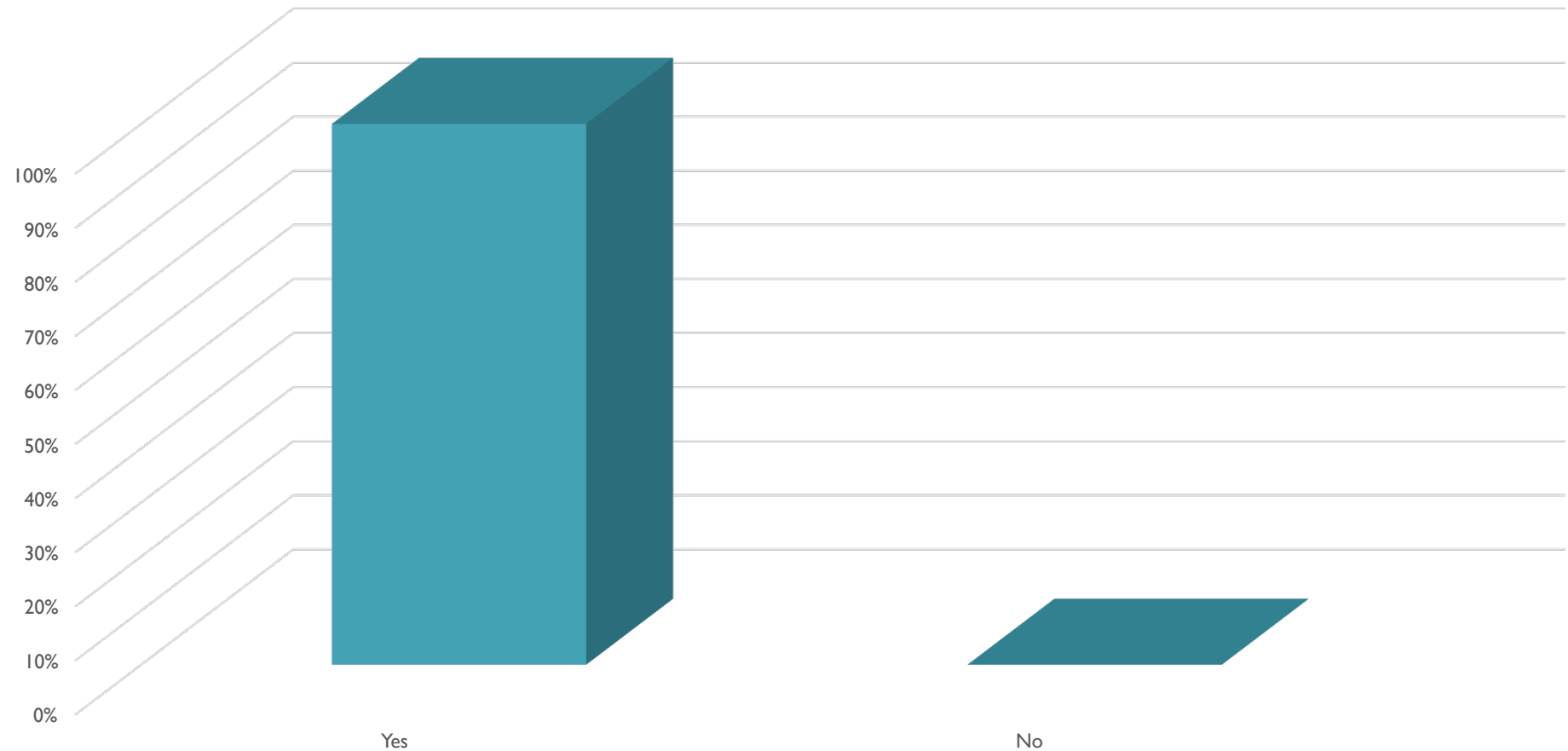
Figure 3: Mobile intenet is useful for academic purposes

Figure 4: Awareness of BRACU mobile library website

Figure 4: Awareness of BRACU mobile library website

No 2%

Yes 98%

Yes

No
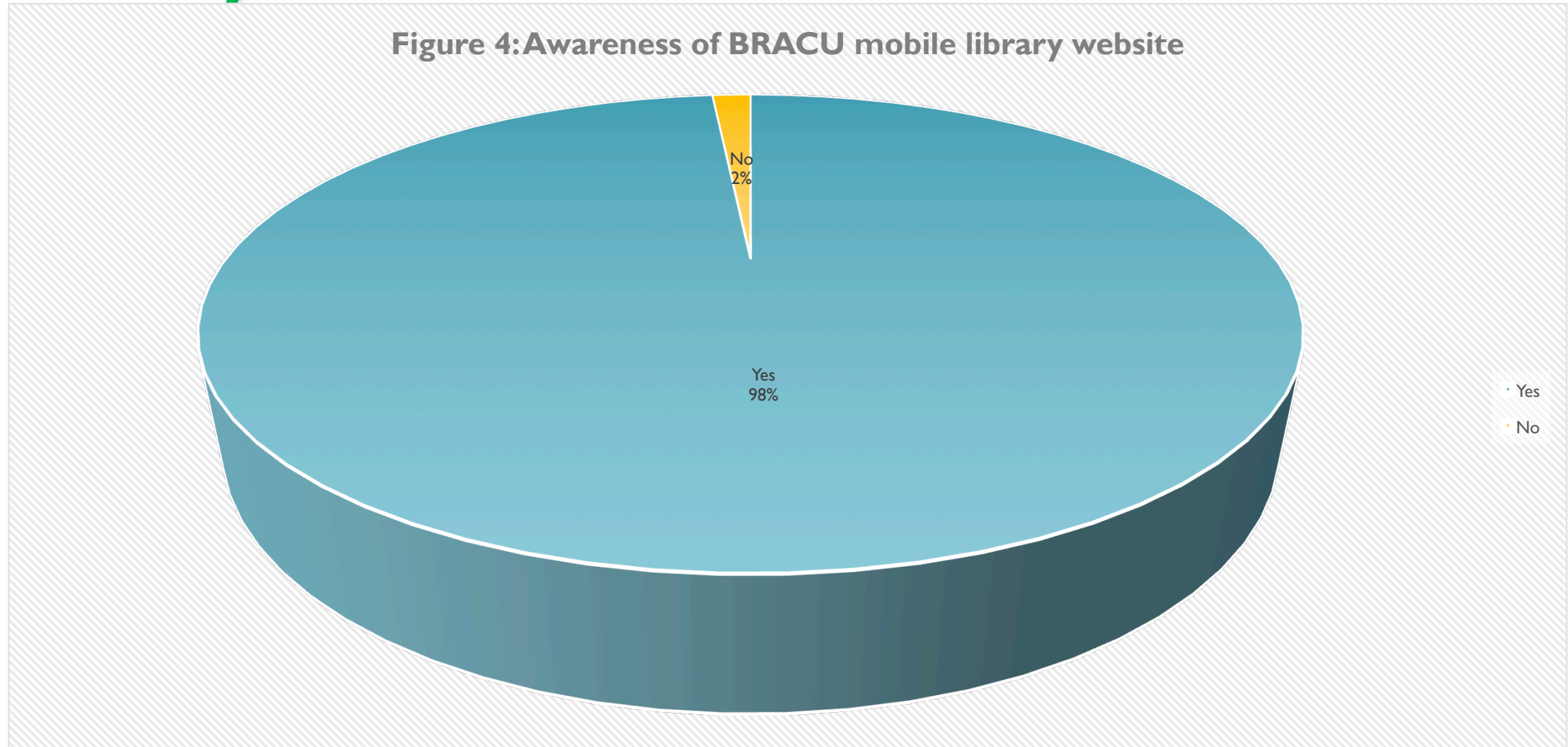
Figure 5: BRACU mobile library website use

Figure 5: BRACU mobile library website use
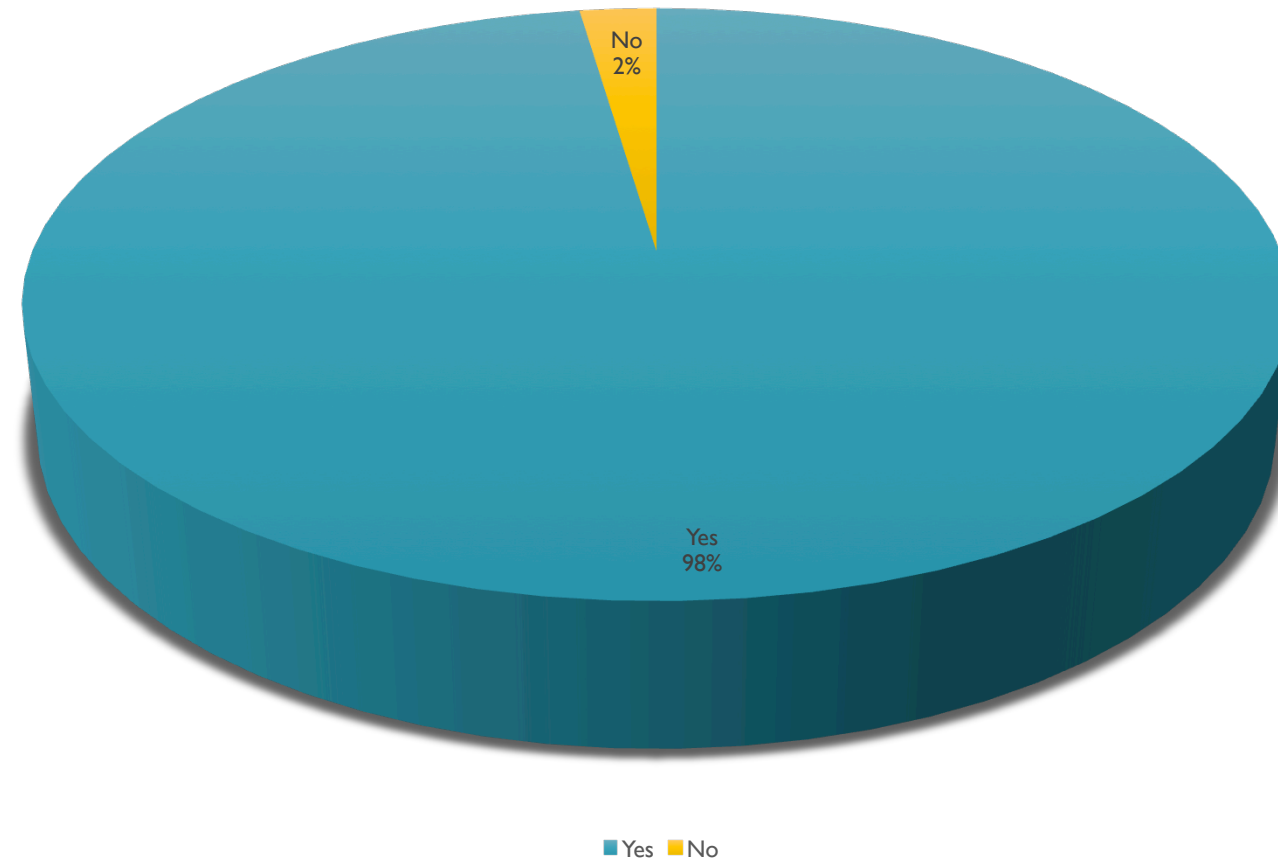
Frequency of BRACU mobile library website use

- Among 129 students, 126 (97.67 percent) students used the Library's mobile website. **The data on frequency of mobile website use (Table 6) indicates that the largest group of students accessed the BRACU mobile library website when needed.** A significant proportion of respondents used the mobile website sometimes. Only a few students used the mobile website on other categories.

Table 6: Frequency of BRACU mobile library website use by gender

Frequency of mobile website use	Male		Female		Total	
	n	%	*n*	%	*n*	%
Sometimes	14	11.11	10	7.94	24	19.05
Most of the times	10	7.94	6	4.76	16	12.70
When needed	24	19.05	15	11.90	39	30.95
Very few times	5	3.97	4	3.17	9	7.14
A few times every day	5	3.97	4	3.17	9	7.14
At least once a day	6	4.76	3	2.38	9	7.14
Most days	4	3.17	3	2.38	7	5.56
A few times every week	2	1.59	4	3.17	6	4.76
At least once a week	3	2.38	4	3.17	7	5.56
Total	73	57.94	53	42.06	126	100

Finding needed information

Table 7 illustrates that 64 (50.79%) students most of the times, sometimes 53 (42.06%), rarely 9 (7.14%) generally find what they are searching for.

Table 7: Finding needed information

Finding needed information	Male		Female		Total	
	n	%	*n*	%	*n*	%
Most of the times	37	29.37	27	21.43	64	50.79
Sometimes	31	24.60	22	17.46	53	42.06
Rarely	5	3.97	4	3.17	9	7.14
Total	**73**	**57.94**	**53**	**42.06**	**126**	**100**

Students' opinions on terminological clarity

Table 8 shows the means and standard deviations (on a 7-point scale) of students' opinion on terminological clarity of BRACU mobile library website. **It seems students are generally satisfied with terminology offered in the interface as most ratings fell above 5** (i.e. the average score).

Table 8: Mean and SD of students' opinions on terminological clarity

Variable	Mean	SD
Simple and natural dialogue	5.42	1.007
Use of terms throughout the interface	5.67	0.894
Prompts for input	5.57	0.898
Error messages	5.63	1.025

Students' opinions on screen design

Table 9 indicates students' opinions on screen design of BRACU mobile library website. **Students seem generally satisfied with BRACU mobile library website as all ratings were above 5 on a 7-point scale.**

Table 9: Mean and SD of students' opinions on screen design

Variable	Mean	SD
Reading characters on the screen	5.83	0.892
Onscreen information	5.67	0.810
Arrangement of information	5.50	0.846
Items are easy to find	5.71	0.799

Students' opinions on navigation

Table 10 shows students' opinions on navigational clarity of BRACU mobile library website. **All students seem highly satisfied with navigational clarity of mobile website such as arrangement of navigational menus/icons, navigation from page to page, screen back track and back to screen**.

Table 10: Mean and SD of students' opinions on navigation

Variable	Mean	SD
Arrangement of navigational menus/icons	5.53	0.772
Navigation from page to page	5.56	0.765
Screen back track	5.77	0.831
Back to search screen	5.40	1.096

Students' opinions on learning

Table 11 indicates respondents' opinions on learnability of BRACU mobile library website interface. **The highest perceived scores were learning to operate the system, help messages on the screen and exploring new features by trial and error.** The lowest perceived scores were performing tasks is straightforward and help access.

Table 11: Mean and SD of students' opinions on learning

Variable	Mean	SD
Learning to operate the system	6.03	0.799
Exploring new features by trial and error	5.65	0.958
Performing tasks is straightforward	5.40	0.869
Help messages on the screen	5.67	1.012
Help access	5.50	0.994

Students' overall reactions to the mobile library website

Table 12 reveals the overall reactions to BRACU mobile library website by the students. **They seem generally satisfied with the current mobile library website as all scores fell above 5 on a 7-point scale.**

Table 12: Students' overall reactions to the mobile library website

Variable	Mean	SD
Terrible vs. wonderful	5.83	0.874
Unimpressive vs. impressive	5.78	0.809
Difficult vs. easy	5.98	0.769
Inefficient vs. efficient	5.97	0.748
Useless vs. useful	5.78	0.893
Unfriendly vs. friendly	5.83	0.837
Frustrating vs. satisfying	5.85	0.904
Ineffective vs. powerful	5.96	0.753
Dull vs. stimulating	5.95	0.884
Rigid vs. flexible	5.68	0.745

Intention to continue using BRACU mobile library website

Table 13 shows that **all of the students 126 (100%) indicated that they intend to continue using BRACU mobile library website in future.**

Table 13 : Intention to continue using BRACU mobile library website

Future use	Frequency n=126	Percentage
Yes	126	100
No	0	0
Unsure	0	0
Total	**126**	**100**

Reasons for not using BRACU mobile library website

The non-users of BRACU mobile library website were asked to indicate the reasons for not using the service. The table 14 shows that only two students do not know how to use it, likewise, only two students do not know where to find it and only one students do not have any interest for currently not using BRACU mobile library website.

Table 14 : Reasons for not using BRACU mobile library website

Reasons for not using	Frequency n=5
I do not know how to use it	2
I do not know where to find it	2
I do not have any interest	1

Discussion and recommendations

- **The overall results of this survey suggest that the students are overwhelmingly satisfied with the BRACU mobile library website.** The library mobile website was recently introduced and it seems students' initial use of the website may have positively influenced their perceptions of and satisfaction with the system. The results also show that a few students were unaware of the mobile website and those who knew did not use it frequently.
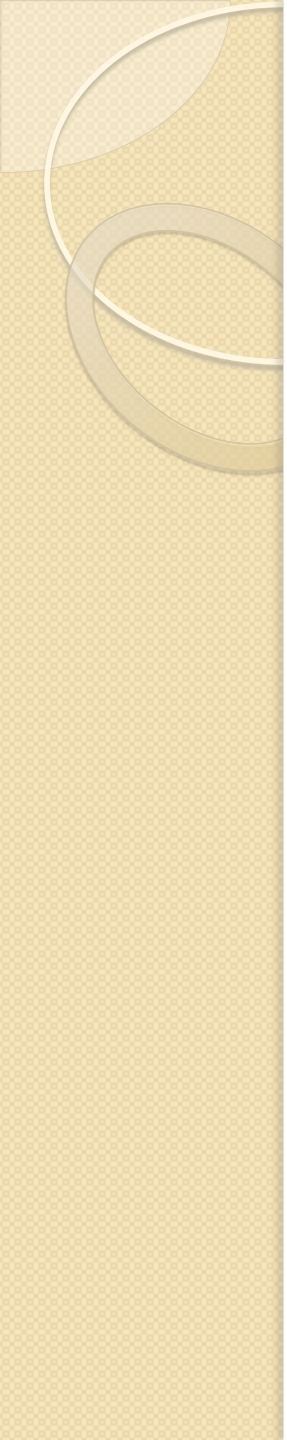
- **This finding suggests that the BRACU Library needs to promote the awareness of and use of its mobile library website by providing comprehensive orientation and information literacy programs to students.** The development of a user-friendly website with enhanced accessibility must be made to increase visibility of the mobile library website. The participation of faculty members in encouraging the use of mobile library website by students is also critical. Most new students come to the university with hardly any library experience.

- **Faculty members could instruct them on how to use the mobile library website as part of their teaching assignments.** **Many students indicated that they sometimes or rarely found what they were searching for in the mobile library website.** Therefore, the functionalities offered by the mobile library website need to be improved to make the searching more efficient and relevant to students' needs. A formal task-based usability test and refinement of the search interface using the test results can enhance the usability of the mobile library website.

- **There are some differences in students' perception of ease-of-use and their satisfaction with mobile library website.** The differences were significant for students' gender, age, frequency of mobile library website use and the success of their search. As opposed to previous studies (see, for example, Kani-Zabihi et al., 2008), this study found that mobile experience and frequency of internet use do not much affect students' opinions on a mobile library website.

- This study found that a comprehensive needs assessment was not conducted before implementing the current mobile library website. The overall results of this study emphasize once again the need for a user-centered approach in designing interfaces (Ahmed et al., 2006). The BRACU mobile library website is still at the formative stage and many different options and search features are yet to be developed; it is expected that involving students in the design process would ensure the usability and acceptability of the interface.

- **This study has clearly highlighted the need for improvement of the current BRACU mobile library website and the students' perceptions of its utility and effectiveness.** The findings indicate that improvements are needed in several areas of the mobile interface, particularly in using simple and natural dialogue, availability of onscreen information, supporting navigation from page-to-page, learning to operate the system, and searching the mobile library website.

- **Based on the findings of this study, some heuristic guidelines are suggested for designing mobile library website interfaces.** These heuristics could be applied globally to designing university mobile library websites to ensure usability and their acceptance by the academic community:

Strive for consistency:

- Inconsistencies in the mobile library interface could affect usability and satisfaction with the interfaces significantly. **It is important to make sure that the terminology, screen design (i.e. colors, backgrounds, fonts, headings, text layout, etc.) and navigation are used consistently across interfaces.** Consistency could greatly reduce the time needed for learning to operate the website, leading to more effective searches and higher satisfaction. The designers should also avoid using technical jargon and buzz words whenever possible.

Incorporate individual differences:

- Mobile library website needs to incorporate users' individual characteristics into its design. **Recognizing that not all users have the same level of proficiency, designers should consider developing a set of search screens to support their unique needs.** For example, novices could be presented with a simple, Google-like interface that offers the basic functionality of the interface. Alternative interfaces could be offered for advanced searchers giving them more control, more options and more features.

Avoid complex navigation:

- Mobile library interface design should **reduce the amount of navigation on the screens** by making the navigation menu available to the user all the time. **The mobile library interface should also provide intuitive bridges between search and result screens.**

Support learnability and memorability:

- **Mobile library website designers could employ a number of techniques to support learnability and memorability.** A compact design that minimizes scrolling and jumping and anchors users in a screen space that tightly couples search and result is useful. Displaying search options as a drop-down list or a set of radio buttons will help to increase learnability and memorability. The mobile interface should also suggest the required format whenever users are asked to input a query statement and, if possible, provide an example of valid input.

Make the actions visible and reversible:

- **All services and actions should be visible to the user. Every action should be reversible so users can go back to a previous state in a session.** This would encourage users to perform exploratory learning since they could always try out new options, knowing they have the ability to get out of trouble without repercussions.

Assist users in refining the search query:

- **Mobile library website should provide clear and simple ways to modify or reset a query. The query can be summarized on the results page so that users can be reminded exactly what was searched for.** Once a search is made, the query terms can be displayed in a window on the top of the results list. This would allow the user to modify the query terms, thus reducing the need to navigate to search screens for query (re)formulation.

Offer informative feedback:

- **The users should be informed about all aspects of the search, such as the fields selected and the query terms entered.** When a search is done, it should be obvious to the user what happened and why. Results should be structured in such a way that the contents of the returned records are clear. The information most important to users should be clearly displayed in the results. The inclusion of the query statement in the result and the highlighting of search terms are essential.

Offer simple error handling:

- **All error messages should be specific, constructive, uncritical of the user, and should offer no more technical detail than necessary.** The error messages should also indicate methods of diagnosing search failures and provide hints on more successful strategies. **The interface should always offer an easy way out from the system.**

Conclusion

- This paper reported an empirical study on BRAC University student's perceptions of ease-of-use and their satisfaction with BRACU mobile library website. **The results of this study could be used to redesign the current BRACU mobile library website.** The author also proposes a formal task-based usability test with the mobile website to determine end-users' performance and success with the system. User task performance can be reviewed and task analysis can be done to find out problem areas in the interface.

- The author believes users' task requirements, along with their perceptions and expectations, form an integral part in the design and development of user-centered mobile library websites. **The designers should adopt such user-centered approach in designing user interfaces for such systems.**

- **This study was a first attempt towards usability evaluation of a university mobile library website based on what students perceived about their experiences of using the mobile interface in Bangladesh.**

- **It has clearly highlighted the need for and benefit of such an approach.** Author's future research would involve students to assess the usability of the interface and to observe their interactions with the interface based on real task driven usage of the system. **Although user interface design is the domain of software developers, this study emphasizes once again the fact that care must be taken to incorporate input from users in terms of their needs and expectations so that the usability of the mobile library websites can be improved and streamlined.**

Thank you!