Information seeking behaviours of engineering students: Case of Near East University

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Abstract

This study examines the information seeking behaviours of university students and explores students' preferences between the university library and the Google search engine with their reasons. The research questionnaire was applied to 250 Near East University, Faculty of Engineering students. According to the results of the study; even students have enough knowledge to use the university library, they prefer to use Google and Internet resources for various purposes because they think that this is the fastest and easiest way to reach information. Even students obtain information via the Internet; they give importance to indicate the source in their assignments and projects. Findings also showed that there are some significant differences between departments' information seeking behaviours.

Keywords: Information seeking behaviours, Internet, Google, engineering education, university libraries.

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1. Introduction

In the past, printed items such as encyclopaedias, newspapers or books were the only sources of information used to reach information. Radio and television were added to these resources with the developing technology (Altay, Akin Gurdal & Yilmaz, 2012). After its invention, Internet technology has developed rapidly and turned into the biggest information store. This situation has led to a change in people's information seeking behaviour (Askar & Mazman, 2013). The amount of information on the Internet has increased day by day and users started to have difficulty about finding what they are looking for. The need to access the right information in a short time caused the invention of search engines (Jarvis, 2011).

Previous research has shown that university students' often use Internet to access information. Therefore, the university libraries have adapted to this change and started to provide electronic resources as well as printed resources for their members (Kurulgan & Argan, 2007). Uçak and Al (2000) emphasised the importance of developing techniques for the users so that they could better access to the Internet resources. Savolainen (2005) classified the barriers to users during access to information and provided solutions for how these barriers could guide the user to the right information.

This research was carried out to determine the information search behaviours and significant differences between the departments of the Faculty of Engineering of Near East University (NEU) in the Turkish Republic of Northern Cyprus (NEU). Since 2008, the Google search engine still maintains the world's most preferred search engine title by 90.8%. The NEU library offers 800,000 printed resources and provides access to approximately 150 million electronic resources. Based on this information, the aim of the research is to explain the choice of participating students between university library and Google together with their reasons.

2. Methodology

In the research, five departments are selected. These departments are Information Systems Engineering (ISE), Electrical Electronics Engineering (EE), Mechanical Engineering (ME), Civil Engineering (CIVE) and Computer Engineering (CE) departments. Fifty students from each department were selected without considering any criterion and students were asked to complete a questionnaire named 'Information Seeking Behaviours of NEU, Faculty of Engineering Students' between February and March 2019. All of our participants are Internet users and members of the university library.

There are two sections in the survey. The first part consists of four questions and aims to determine the demographic information of the participants. The second part, which consists of seven questions, is designed to provide information about the participants' information search behaviour. The Cronbach's Alpha value of the survey was 0.775. The data collected through the questionnaire were evaluated with SPSS 20. Table 1 summarises the demographic data of the participants.

Table 1. Demographic data of the participating students

Characteristic	Frequency	%
Age		
18–22	66	26.4
23–27	159	63.6
28–32	22	8.8
33+	3	1.2
Gender		
Female	23	9.2
Male	227	90.8
Program		

3 Years Technical	1	0.4
Undergraduate	246	98.4
Masters	3	1.2

3. Findings

Table 2. Students' research needs and research skills

	Mean	SD
I enjoy doing research	1.62	0.84
I need to do research for my courses or homework	1.68	0.82
I know what I have to do to get the information I need.	1.68	0.82

Sd, Standard deviation.

Table 2 shows the One Sample *t*-test results about the research needs and skills of the participants. In the questionnaire, three questions were asked using the 5-point Likert scale. 1 = Totally Agree, 2 = Agree, 3 = Unsure, 4 = Disagree and 5 = Totally Disagree. In general, when the averages of the participants are examined, we see that the engineering faculty students like to do research, they need to do research for their courses and they have enough knowledge about how they can reach the information they need.

Table 3. Students' research needs and skills by department

	Dept.	N	Mean	F	Sig.
I enjoy doing research	EE	50	1.70	1.975	0.099
	ISE	50	1.43		
	CE	50	1.65		
	ME	50	1.48		
	CIVE	50	1.84		
I need to do research for my lessons or homework	EE	50	1.94	4.876	0.001*
	ISE	50	1.35		
	CE	50	1.79		
	ME	50	1.50		
	CIVE	50	1.84		
I know what I have to do to get the information I need.	EE	50	1.94	4.876	0.001*
	ISE	50	1.35		
	CE	50	1.79		
	ME	50	1.50		
	CIVE	50	1.84		

N, Frequency; *F*, *F* Statistic; Sig., Significance.

Table 3 shows the results of one-way ANOVA of students' research needs and skills by department. According to the results obtained, 95% confidence in the group variance is homogeneous. For this reason, Tukey test was applied to reveal the significant difference between the departments. As it is understood from the table, all students' enjoys to do research and condition does not differ according to departments. However, when research needs of the students were analysed according to the departments, ISE and ME students showed a significant difference from other departments. According to the results, students of these two departments need to do more research than other department students. In the same way, it was observed that there was a significant difference in the research skills of two department students compared to the other department students.

Table 4. Resource preferences of students

	N	Mean	SD
Google	250	1.26	0.58
Electronic database of the university library	250	3.10	1.32
Printed resources in the library	250	2.98	1.37
Wikipedia	250	2.06	1.17
Resources given by the lecturer	250	2.29	1.17
Own books or resources	250	2.70	1.30

Table 4 reflects the resource preferences of the participating students. In this survey, six questions were asked using the 5-point Likert scale. In scale 1 = Always, 2 = Very Frequent, 3 = Sometimes, 4 = Rarely and 5 = Never classified. When we look at the results of the participating students in general, we see that the most used source is the Google. Electronic resources of the university library are reflected in the results as the least preferred source. It was also determined that all of the participating students only used Google search engine during the research.

Table 5. Resource preferences of students by departments

	Dept.	N	Mean	F	Sig.
Google	EE	50	1.30	2.099	0.082
	ISE	50	1.12		
	CE	50	1.16		
	ME	50	1.40		
	CIVE	50	1.34		
Electronic database of the university library	EE	50	2.98	3.627	0.007*
	ISE	50	3.71		
	CE	50	2.96		
	ME	50	2.84		
	CIVE	50	3.00		
Printed resources in the library	EE	50	2.88	2.929	0.022*
	ISE	50	3.55		
	CE	50	2.73		
	ME	50	2.80		
	CIVE	50	2.96		
Wikipedia	EE	50	2.14	2.304	0.059
	ISE	50	1.80		
	CE	50	1.96		
	ME	50	1.98		
	CIVE	50	2.46		
Resources given by the lecturer	EE	50	2.28	2.104	0.081
	ISE	50	2.69		
	CE	50	2.29		
	ME	50	2.06		
	CIVE	50	2.16		
Own books or resources	EE	50	2.68	1.7	0.151
	ISE	50	3.10		
	CE	50	2.71		
	ME	50	2.48		
	CIVE	50	2.56		

For Table 5, one-way ANOVA is used to determine whether there is a significant difference in the research preferences of students by departments. According to the results of the test, only one significant difference was observed in the use of both the electronic and printed sources of the

university library. Homogeneity test results show that the variances are distributed homogeneously with 95% confidence. Therefore, significant differences were determined between the sections by applying Tukey test on these subjects. Findings showed that ISE students have the least use of electronic and printed sources of university library compared to other departments and the department has significant difference between all other departments.

Table 6. Most used resources

	N	Mean	SD
Lecturer	250	2.58	1.27
Advisor	250	3.19	1.36
Friends	250	1.98	1.10
Internet	250	1.38	0.67
Lecture notes	250	2.10	1.25

Table 6 shows the results of the one-sample *t*-test applied to determine most used resources by students' during research. In this part of the questionnaire, 5-point Likert scale is used to determine 1 = Always, 2 = Very frequent, 3 = Sometimes, 4 = Rarely and 5 = Never. According to results, Internet is the most applied resource. However, when we look at the results in general, we can see that the students actively use all the resources in the list.

Table 7. Most used resources by students according to departments

	Department	*N*	Mean	*F*	Sig.
Lecturer	EE	50	2.80	2,651	0.034*
	ISE	50	2.82		
	CE	50	2.30		
	ME	50	2.22		
	CIVE	50	2.74		
Advisor	EE	50	3.32	5.096	0.001*
	ISE	50	3.74		
	CE	50	3.10		
	ME	50	2.58		
	CIVE	50	3.20		
Friends	EE	50	2.28	3.882	0.004*
	ISE	50	1.52		
	CE	50	1.97		
	ME	50	1.90		
	CIVE	50	2.22		
Internet	EE	50	1.40	2.584	0.038*
	ISE	50	1.27		
	CE	50	1.28		
	ME	50	1.32		
	CIVE	50	1.64		
Lecture notes	EE	50	1.94	7.409	0.000*
	ISE	50	2.82		
	CE	50	2.12		
	ME	50	1.56		
	CIVE	50	2.06		

Table 7 shows the results of the one-way ANOVA of variance applied to identify the most used resources by student according to departments. According to the results, there are significant differences between departments in all topics. The variances in the lecturer and Internet items were distributed homogeneously with 95% confidence, while the other items were not distributed

homogeneously. In this case, Tukey test was applied to the instructor and Internet items, while Tamhane's T2 test was applied to other items. The results showed that there is a significant difference between ISE and CIVE departments in getting help from Internet sources. Students in these two departments receive more help from Internet sources than other departments. There is a significant difference between the ISE and ME departments in the study. While ME students ask help from their advisors frequently, advisors are last to help resource for ISE department students. A significant difference was found between the ISE with EE and CIVE students in asking help from friends. According to results, ISE students are determined as the department that receives the most help from friends, while the cooperation between EE and CIVE students is low. About getting help from the lecture notes, the CE department did not show any significant differences with the students. There was a significant difference between ME department and EE, ISE and CIVE departments. In the results obtained, students of ME department use lecture notes more than students of EE, ISE and CIVE departments. At the same time, it is observed that ME department students ask help from their lecturers most frequently and has a significant difference between all departments.

Table 8. Opinions of students about qualifications of the information they have reached

	N	Mean	SD
Reliability	250	1.24	0.43
Easy access	250	1.38	0.49
Currency	250	1.37	0.49
No criterion	250	1.92	0.28

Generally, users obtains lots of information as a result of their research studies and they select the one which suits their criteria's' most or some of them has no criteria. Table 8 reflects the results of the one sample *t*-test about the views of the students' on about qualifications of the information they obtained as a result of their research. For all topics on a 5-point Likert scale, 1 is determined for 'Agree' and 2 is determined for 'Disagree'. According to the results, gives importance to reliability, easy access and currency and they don't prefer to use the information which does not suit to these criteria. No significant difference was observed between the departments.

Table 9. Why students prefer to use Internet?

	Mean	SD
Using Internet is easier than using printed resources of library.	1.66	0.87
Using Internet is easier than using electronic resources of library.	1.70	0.84
I need help to use electronic resources of library	2.47	1.17

Table 9 shows why students prefer to do research on Internet, rather than using library resources. On the 5-point Likert scale used in the questionnaire, 1 = Totally Agree, 2 = Agree, 3 = Unsure, 4 = Disagree and 5 = Totally Disagree. According to results, the students think that accessing to information via Internet is much easier than printed and electronic resources of the library. At the same time, all the participating students need help to use electronic resources of the library.

Table 10. Why students prefer to use Internet? (By department)

	Dept.	N	Mean	F	Sig.
1- Using Internet is easier than using printed resources of library.	EE	50	1.68	6.935	0.000*
	ISE	50	1.23		
	CE	50	1.59		
	ME	50	1.72		
	CIVE	50	2.10		
2- Using Internet is easier than using electronic resources of library.	EE	50	1.70	5.024	0.001*
	ISE	50	1.33		
	CE	50	1.75		
	ME	50	1.70		
	CIVE	50	2.06		
3- I need help to use electronic resources of library	EE	50	2.24	1.524	0.196
	ISE	50	2.64		
	CE	50	2.67		
	ME	50	2.28		
	CIVE	50	2.54		

Table 10 shows the reasons why students prefer Internet for research according to departments. According to results of one-way ANOVA analysis, there are significant differences between the departments for first and second topics. For the first title, the variances were not homogeneously distributed and Tamhane's T2 test was applied. According to the findings, the CE section showed a significant difference with no part. The ISE section showed significant differences in the EE, ME and CIVE sections. In comparison with EE, ME and CIVE students, using Internet is easier for ISE students.

For the second title, the variances were homogeneous with 95% confidence and Tukey test was applied. There were significant differences between the ISE and CIVE departments. In comparison with CIVE students, ISE students think that using Internet is much easier than using electronic resources in the library.

Table 11. Online information seeking behaviours of students

	Mean	SD
1-I use different keywords as online search progresses.	1.75	0.79
2-I search online according to the words in my homework/project.	1.86	0.88
3-Whle choosing the information I find online, I look at the topic of the research subject.	2.22	2.20
4-While choosing the information I find online, I look at the content of the research topic.	1.86	0.94
5-When I search online, I look at the reference given for the reliability of the information I found.	2.10	1.11
6- I copy the information I found for my homework/projects and I use references.	2.28	1.18
7- I write the information I found for homework/project with my own words and I use references.	2.38	1,23

Table 11 shows the results of the one-sample *t*-test used to determine the online research behaviours of the students. In the 5-point Likert scale used in the survey question, 1 = Always, 2 = Often, 3 = Sometimes, 4 = Rarely and 5 = Never. Findings have shown us that students often use different keywords as online search progresses. While doing online research, searching according to the subject topic in the assignments and using the resources after checking the contents of the sources are the another research behaviours that the students repeat often. For the reliability of the information found, students check the references often. While they often copy the information they found for homework/projects and use references, students also write the information they found with their own words and they also use references often.

Table 12. Online information seeking behaviours of students by department

	Dept.	*N*	Mean	*F*	Sig.
1-I use different keywords as online search progresses.	EE	50	1.86	7.093	0.000*
	ISE	50	1.39		
	CE	50	1.61		
	ME	50	1.72		
	CIVE	50	2.16		
2-I search online according to the words in my homework/project.	EE	50	1.92	5.459	0.000*
	ISE	50	1.47		
	CE	50	1.76		
	ME	50	1.94		
	CIVE	50	2.24		
3-Whle choosing the information I find online, I look at the topic of the research subject.	EE	50	2.50	1.649	0.163
	ISE	50	2.73		
	CE	50	1.71		
	ME	50	2.04		
	CIVE	50	2.12		
4-While choosing the information I find online, I look at the content of the research topic.	EE	50	2.04	10.012	0.000*
	ISE	50	1.41		
	CE	50	1.55		
	ME	50	1.90		
	CIVE	50	2,40		
5-When I search online, I look at the reference given for the reliability of the information I found.	EE	50	1.90	12.998	0.000*
	ISE	50	2.98		
	CE	50	1.73		
	ME	50	1.76		
	CIVE	50	2.08		
6- I copy the information I found for my homeworks/projects and I use references.	EE	50	2.04	10.639	0.000*
	ISE	50	3.06		
	CE	50	1.92		
	ME	50	1.86		
	CIVE	50	2.52		
7- I write the information I found for homework/project with my own words and I use references.	EE	50	2.10	4.924	0.001*
	ISE	50	2.94		
	CE	50	2.08		
	ME	50	2.18		
	CIVE	50	2.58		

Table 12 shows the results of one-way ANOVA analysis applied for the information seeking behaviours of the students according to the departments. The obtained data shows that there are significant differences between departments in all topics other than the third one. Variance homogeneity in all items except the fifth and sixth topics is 95% confidence in the variance homogeneity test. So, the Tamhane's T2 test was used for these two topics, while the Tukey test was used for others.

For first topic, the behaviours of CIVE students were similar to EE students, while they differed significantly with other departments. This analysis shows us that ISE, CE and ME students are more likely to change the search term than their CIVE and EE students during their online research. In the second chapter, there was a significant difference between ISE and other departments. According to the findings, ISE students are more dependent on the words in their assignments than the students of other departments. In the fourth topic, while EE and CIVE students showed similar behaviours, they showed significant differences with CE, ISE and ME students. According to the results, CE, ISE and ME

students are more frequently reviewing the contents of the sources they found compared to EE and CIVE students. In the fifth topic, ISE students showed a significant difference with all other students. The ISE students sometimes check the references of the resources, while other department students check the references more frequently. There is a significant difference between ISE students and other departments in the sixth topic. While other department students give more importance to mention references in their homeworks/projects, ISE students do it sometimes. In the seventh topic, the behaviour of ISE students shows a significant difference with the other department students. While other students prefers to write the information they found for homework/project with their own words and I use references, ISE department students are less likely to show same behaviour.

4. Conclusion

According to the results of the study, students like to do research, need to do research for their courses and have enough knowledge about how to reach the necessary information during their research. In previous studies, it has been stated that even elementary school students use the Internet as the primary source for access to information (Ekici & Ucak, 2012). In this study, it has been revealed that the Internet and especially Google is the most popular research resource for all students. Students see the use of printed sources in the university library as a laborious task. They don't use the library's electronic databases too, and students need help to use these resources. In other words, they don't know how to use it. Cengiz (2016) evaluated the websites of university libraries and stated that online databases of libraries should be designed for the user. Thus, users could benefit more from electronic information. Brophy and Bawden (2005) studied Google stated as the first source of choice for users to access information. However, the electronic resources of university libraries give more reliable and accurate results, and the users prefer to obtain information from the fastest and easiest resource. Among the reasons for the students who use the Internet resources more frequently than the library resources, we can see easy accessibility.

It is hoped that this research will provide information about the library and the electronic resources usage of engineering students of NEU. Further research can be developed in the following ways:

☐ By increasing the number of participating students.
☐ By increasing the number of departments.
☐ Comparison between faculties.
☐ By comparing the information seeking behaviours of university students in the North Cyprus and/or other countries.

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