

## Electronic Resources as a Main Tool for Improvement of Research Output of Academic Staff: A Case Study of Princess Nourah bint Abdulrahman University

Doaa Abdel-Gaber Abdel-Aleem Ali<sup>1,2</sup>

### Abstract

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The purpose of this paper is to highlight the use of electronic resources as a main tool for improving the research output of academic staff and to investigate the impact on and the different challenges that are faced by researchers who use the online database in Princess Nourah University (PNU). For conducting the research, a survey method was implemented and data from 274 respondents were collected and analysed. The obtained data were expressed in simple frequency counts and percentages. Findings revealed the great dependence of the academic staff on the e-resources and online databases for achieving and improving their teaching and research outputs. The study recommends that the PNU libraries subscribe to different e-resources and databases to cover all programmes (medicine, science/engineering, and social sciences) that are run by the university, establish regular training programs and ensure off-campus retrieval of these resources.

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**Keywords:** E-resources, online databases, information retrieval, electronic library, Princess Nora University

### Introduction

Electronic resources (e-resources) are mainly used by academic staff for scientific research and teaching, and they have become the main tool for conducting research in academic institutes and universities. E-resources permit the retrieval of huge amounts of information that is essential for improving the quality of the educational process for both students and staff members.

Academic staffs usually access the e-resources from their university laboratories and offices. A university's subscription to many electronic resources and databases aids in the retrieval by academic staff of huge amounts of information free of charge. The e-resources usually depend on different periodical databases and are available in the forms of websites, e-journals, e-books and e-data archives, online public access catalogue (OPAC), CD-ROM, in addition to bibliographic and full-text databases, scholarly databases, audio files and videos. E-resources have become the main source of professional literature information in academic institutes due to their powerful retrieval function and the fact that they are continually and quickly updated.

Across the globe, many studies have explored the importance of the use of internet and e-resources in all stages of the educational process by both students and staff members. While libraries face many obstacles in financing collection development, the e-resources technology offers possible ways to access huge amounts of information with a reduced cost within shortest possible time. In Nigeria, a study conducted by Egberongbe (2011) found that a wide range of the academic staff used electronic resources to carry out their research at the University of Lagos. Aregbesola and Oguntayo (2014) stated that the majority of the faculty members at Landmark University used the e-resources for academic purposes. A study by Deng (2010) exhibited the effect and impact of use e-resources in both research and teaching in Australian universities. Moreover, a study by Shelton (2011) about the use of e-resources by academic staff at UK universities showed that 87% of the respondents were using e-resources in their research and academic

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<sup>1</sup> Department of Libraries and Information, College of Arts, Princess Nourah bint Abdulrahman University, Airport Road, Narjes Neighborhood, Riyadh 11671, Saudi Arabia. E-mail: [daabdulalem@pnu.edu.sa](mailto:daabdulalem@pnu.edu.sa)

<sup>2</sup> Department of Libraries, Documents and Information, Faculty of Art, Assiut University, Assiut 71515, Egypt. E-mail: [doaaa82@yahoo.com](mailto:doaaa82@yahoo.com)

activities.

However, studies by Tella et al. (2018) and Agaba et al. (2004) showed little use of internet and e-resources among the academic staffs in some academic institutes and universities in Africa due to poor internet facilities, a lack of the requisite skills for the use of e-resources and ineffective marketing strategies on the availability of the resources.

### Literature Review

With the huge growth of data produced every day, effective information retrieval methods are required for easy access to information, particularly among academics at universities. The e-resources and digital databases have an important role in the organization of and easy retrieval of information, which has a positive impact on the quality and quantity of research output for academics.

Many studies have confirmed that there is a positive relationship between the use of electronic information resources and the improvement of both education and research outputs (Shela, & Greshan, 2000; Zhang, 2001; Kyrillidon, 2001; Ergart, 2002; Ojedokun, & Owolabi, 2003; Jankowska, 2004; Ellis, & Oldman, 2005; Manda, 2005; Barjak, 2006; Al-Ansari, 2006; Sharma, 2009; Haridasan & Khan, 2009; Trivedi, 2010; Sujatha and Murthy, 2010; Ajala et al., 2010; Isah, 2010; Madhusuudhn, 2010). This relationship is influenced by many factors, such as infrastructure, available budget, user skills, training and knowledge of users and technical support offered from the academic institute. Any shortage of one of these factors is considered a barrier to the effective access and use of the information (Johnston, & McCormack, 1996; Ashcroft, & Watts, 2005; Adomi, 2005; Oduwole, & Sowole, 2006; Ekenna, & Iyabo, 2013).

However, many studies investigated the constraints that associated with the use of e-resources among academic staff, and reported many others, such as inadequate time, slow downloading, lack of electronic resources, poor awareness of electronic information resources, poor subject coverage in addition to irregularity in subscription to e-journals (Igbo, & Imo, 2010; Omotayo, 2010; Natarajan et al., 2010).

As far as we know, few studies have been conducted to assess the impact of the use of e-resources among academic staff in Saudi Universities in general and Princess Nourah University in particular and to identify the variables that could influence their use (Rajeh, 2003; Al – Khathami, 2010; Al-Zafairi, 2013; Hadeeb, & Al-Anz, 2013).

The purpose of this paper is to evaluate the current status and impact of the use of e-resources on the research and education outputs among the academics of Princess Nourah University (PNU), in addition to determining the different challenges that could be faced by them during their use.

### Research Problem and Objectives

Owing to an information explosion and an increase in the growth of electronic publications, the concept of the traditional library has changed so that it now offers digital resources in addition to traditional printed materials. E-resources are popular because they are easily accessible, more comprehensive, current and more flexible than the printed materials when searching for information.

Despite the multiplicity of electronic sources and databases, and the high material cost of providing these resources, Princess Nourah bint Abdulrahman University (PNU) spares no effort to provide these resources to its staff members and students in all disciplines through providing financial support and infrastructures to improve the quality of both teaching and research processes. Despite these efforts, the impacts on the teaching and research process are still somewhat as not as expected. This means that not all staff members usually benefit from the available resources properly either in their scientific research or in teaching students and from here the problem of the study was originated. However, the proper benefits from e-resources usually depend on several factors, such as: the adequate awareness of the faculty members about the importance of using electronic resources in the development of their research and scientific skills; the extent of the availability of these resources to cover the various disciplines and fields of research; the amount of time and effort required to retrieve the information, ...*etc.* Thus, the main objective of this study is to evaluate the usage of e-resources by the academic staff at PNU for the following reasons:

1. To raise the awareness and knowledge of faculty academics about the availability of e-resources in their institutions.
2. To determine the place and the purpose of using e-resources by academic staff.
3. To identify the frequency and locations of using e-resources among academic staff at PNU.
4. To identify the impact of using e-resources on the quality of research and teaching of academic staff at PNU.
5. To identify the main e-resources and databases that are commonly used by PNU staff.

6. To identify the satisfaction level of e-resources usage among the academic staff.
7. To determine the factors that motivate and hinder the use of e-resources among academic staff.

### Research Questions

1. Are the academic staff aware that the university provides an access to e-resources?
2. Why do academic staff use e-resources?
3. How frequently do academic staff use e-resources?
4. Where do the academic staff use e-resources?
5. What is the perceived impact of using the e-resources on the research and teaching of the academic staff?
6. What are the commonly used e-resources?
7. What is the level of satisfaction of the academic staff regarding the e-resources at PNU?
8. What are the challenges that hinder the use of e-resources by academic staff?

In addition to the above questions, there is a section concerning the demographic information of the study population.

### Methodology

#### Study Area

A descriptive approach was adopted to achieve the objectives of the current study and to answer the raised questions. A questionnaire-based survey method was used for data collection in addition to interviews and document analysis. The area of study comprised of faculty members of PNU, Riyadh, Saudi Arabia.

#### Sampling Procedure and Data Analysis

A random sampling technique was used to select 300 academic staff distributed among 12 faculties expressing 3 academic programs: 1) Colleges of Medicine, 2) Colleges of Sciences, and 3) Colleges of Humanities (Table 1, Figure 1). Out of 300 copies of the questionnaire administered, 274 were completed and returned representing 91.3%. The data from the returned copies of the questionnaire were recorded and statistically analyzed using the Statistical Package for Social Science (SPSS) software.

Table 1. Distribution of respondents by colleges

Academic Programs	Frequency	% distribution
<b>Medical Colleges</b>		
Medicine	37	13.5
Dentistry	24	8.8
Pharmacy	12	4.4
Nursing	17	6.2
Health and Rehabilitation Sciences	18	6.5
<b>Colleges of Sciences</b>		
Sciences	35	12.8
Computer and Information Sciences	21	7.7
Business Administration	16	5.8
Arts and Design	23	8.4
<b>Colleges of Humanities</b>		
Arts	19	6.9
Education	21	7.7
Languages	14	5.1
Social Services	17	6.2
<b>Total</b>	<b>274</b>	<b>100.0</b>

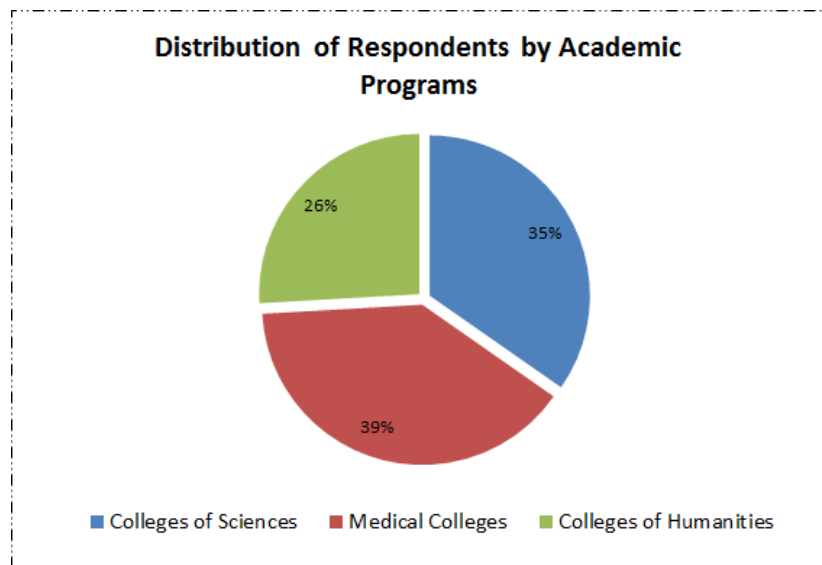


Figure 1. Distribution of respondents by academic programs

## Results

### Demographic Characteristics of the Respondents

A total of 300 copies of the questionnaire were distributed and 274 copies of a very high return rate (91.3%) were completed and returned. The results (Table 1) showed that the majority of the respondents were belonging to the medical colleges (39.4%) distributed as 13.5% from College of Medicine, 8.8% from college of Dentistry, 4.4% from College of Pharmacy, 6.2% from College of Nursing and 6.5% from the College of Health and Rehabilitation Sciences. The colleges of sciences have the highest second percentage (34.7%) after medical colleges, and distributed as 12.8% from College of Sciences, 7.7% from College of Computer and Information sciences, 5.8% from College of Business Administration and 8.4% from College of Arts and Design. Finally, the lowest response was received from colleges of humanities (25.9%), comprising of 6.9% from College of Arts, 7.7% from College of Education, 5.1% from College of Languages, and 6.2% from the College of Social Services.

The demographic information (Table 2) recovered from the respondents' survey revealed that the majority of them were aged between 31-50 years (64.2%), followed by those between the ages of 51-60 years (21%), while the young academics (20-30) years comprise only 13.1% of the respondents. A total of 3 respondents (1.1%) were over 60 years. Regarding gender, the results exhibit that 95.3% of the respondents were female, and this is due to that the university is basically a female university. Regarding the qualification of the respondents, the majority of them were Ph.D. holders (71.5%) in the rank of assistant professor (37.6%) followed by associate professor (23.4%). The least response was received from demonstrator with a percentage of (8.4%). The marital status and residence in the campus showed insignificant difference among respondents with a preference toward the married (51.5%) and campus resident (52.6%) respondents.

Furthermore, Table 2 showed that the highest percentage of the respondents are able to read the electronic databases in both Arabic and English languages, as this percentage reached 81% of the total respondents, compared to only 19% of the respondents are able to read the Arabic databases only. This data reflects the need of researchers and faculty members in PNU to develop their linguistic competence to improve their scientific research and to keep up with the current information.

Table 2. Demographic characters of the respondents

Variable	Measurement	Frequency	Percentage (100%)
Age (years)	20-30	36	13.1
	31-40	74	27.0
	41-50	102	37.2
	51-60	59	21.5
	>60	3	1.1
<b>Total</b>		<b>274</b>	<b>100</b>
Gender	Male	13	4.7
	Female	261	95.3
<b>Total</b>		<b>274</b>	<b>100.0</b>
Educational Qualification	PhD	196	71.5
	Masters	55	20.1
	Bachelor Degrees	23	8.4
<b>Total</b>		<b>274</b>	<b>100.0</b>
Academic Rank	Professor	29	10.6
	Associate Professor	64	23.4
	Assistant Professor	103	37.6
	Lecturer	55	20.0
	Demonstrator	23	8.4
<b>Total</b>		<b>274</b>	<b>100.0</b>
Marital Status	Married	141	51.5
	Single	133	48.5
<b>Total</b>		<b>274</b>	<b>100.0</b>
Residence	Living in campus	144	52.6
	Living off campus	130	47.4
<b>Total</b>		<b>274</b>	<b>100.0</b>
Language Proficiency	Arabic Only	52	19.0
	Arabic and English	222	81.0
<b>Total</b>		<b>274</b>	<b>100%</b>

### Awareness of the Availability of E-Resources

The results exhibited that all respondents are aware that the university provides an access service to the e-resources for their teaching and research purposes. This sufficient knowledge is due to the continuous training workshops that held by the Deanship of Library Affairs that establish an annual program to improve the academic skills including the information retrieval using the electronic resources.

### Purpose of E-Resources Usage

The results (**Table 3**) obtained from asking respondents about the purposes of using e-resources, indicate that the main purposes of e-resources usage are doing research work (84.3%), curriculum development in their specialty fields in addition to self-educational (81.0%) and skills development (19.0%) with less attention to other insignificant purposes (13.5%) such as entertainment including identification of new researchers in their specialties. The results (**Figure 2**) reflect that academics are very familiar with the importance of using the e-resources in the personal and educational process development.

Table 3. Purpose of using Electronic resources

Purposes	YES		NO	
	Frequency	Percentage	Frequency	Percentage
Research Work	231	84.3	43	15.7
Curriculum Development	196	71.5	78	28.5
Self-educational development	222	81.0	52	19.0
Skills development	154	56.2	120	43.8
Teaching	107	39.1	167	60.9
Others	37	13.5	237	86.5

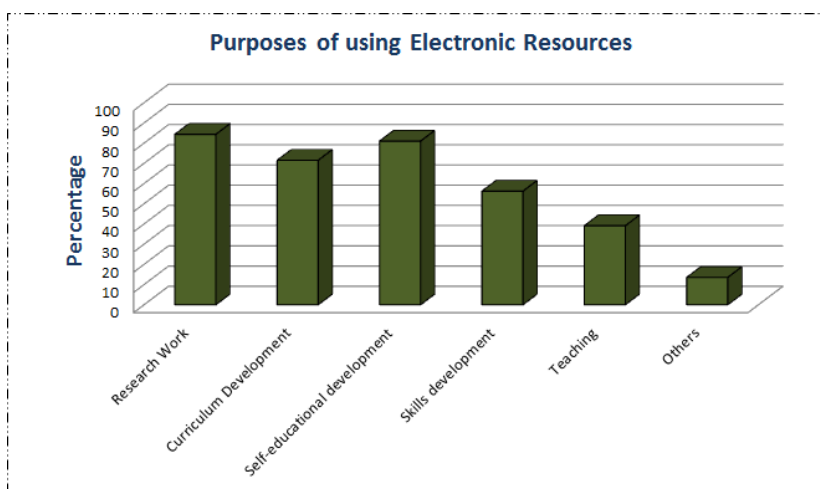


Figure 2. Purpose of using electronic resources

### Frequency and Location of Using Electronic Resources

Asking of respondents about the frequency and locations of using e-resources indicates that the majority of respondents use their offices and laboratories for e-resources access (50.7%) in a weekly pattern (Table 4). The data also revealed that most of the respondents were occasionally getting access via the library facilities which can be referred to the availability of e-resources access across all university buildings including housing which could discourage the academics to physically visit the library unless he is looking for quietness and specific hard copy references.

Table 4. Frequency of using Electronic resources

Access Point	Daily	Weekly	Occasionally	Not at All	Total (100%)
Office/Laboratory	61 (22.3)	139 (50.7)	56 (20.4)	18 (6.6)	274 (100%)
University Central Library	11 (4.0)	73 (26.6)	163 (59.5)	27 (9.9)	274 (100%)
Campus accommodation	9 (3.3)	94 (34.3)	41 (15.0)	130 (47.4)	274 (100%)
Off Campus	26 (9.5)	67 (24.5)	28 (10.2)	153 (55.8)	274 (100%)

The results also showed the ability of the campus resident academics (34.3%) to access to e-resources in a weekly pattern (2-3 times/week), but this is percentage was decreased to (24.5%) for access outside the campus. It is worth to say that the university established a distinguished access to e-resources via an integrated interactive system (Blackboard) which can connect the academics with the Saudi Digital Library (SDL) to access to many e-resources

(Figure 3). The academics who are anywhere outside the campus can connect through the Blackboard system to SDL and access to all e-resources and databases. Despite the availability of the e-resources access off campus, the academics preferred the campus access due to many factors such as regular and fast internet services, constant power supply in addition to the availability of technical facilities and support to access the e-resources in some cases.

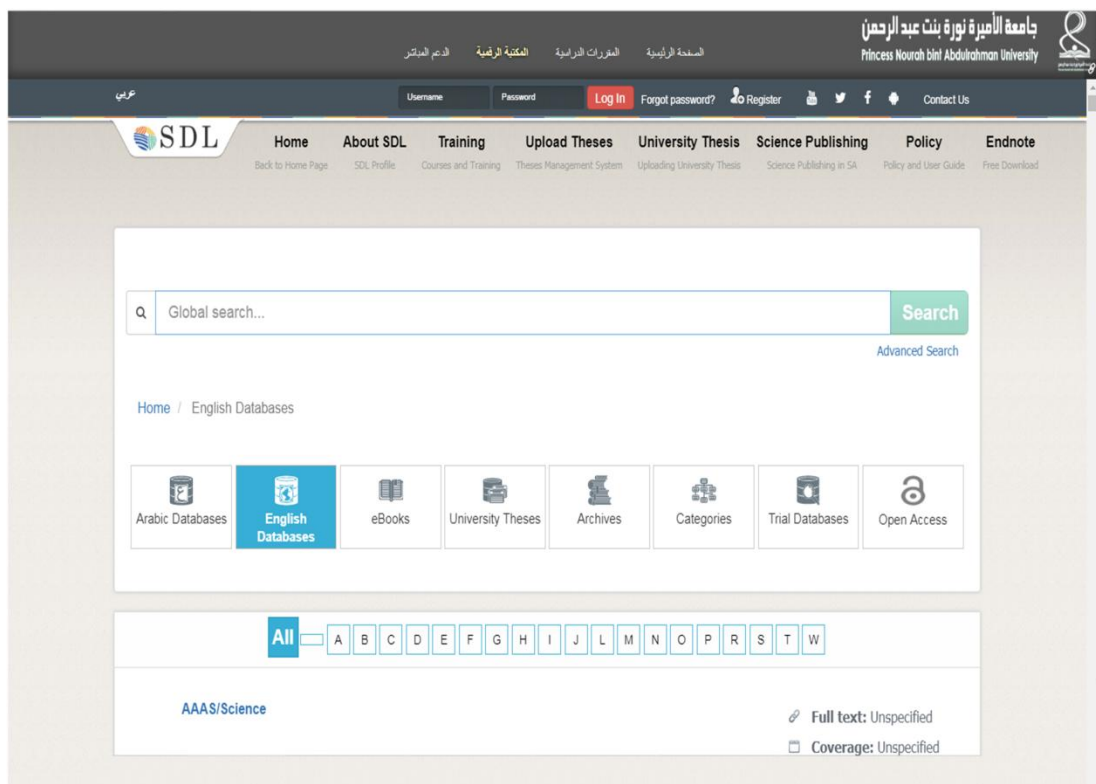


Figure 3. Access to electronic resources through Blackboard system at PNU.

### Impact of Using E-Resources

The impacts of using e-resources were obtained from the answers of the respondents as presented in Table 5. The results showed that the access to the e-resources improve the whole academic process through improving the teaching ability, the academic research output in both quality and quantity as well as it has a noticeable positive effect in the whole educational process. Other positive effects mentioned by the respondents include strengthen the relationship between academics and open new fields for academic research.

Table 5. Impact of using Electronic resources

Purposes	Agree		Disagree	
	Frequency	Percentage	Frequency	Percentage
Improve teaching ability	243	88.7	31	11.3
Help in academic research	258	94.2	16	5.8
Improve the educational system	257	93.8	17	6.2
Self-educational improvement	231	84.3	43	15.7
Others	196	71.5	78	28.5

**Commonly Used E-Resources**

The results in Table 6 exhibited that respondents turn to mainly use the free search engines (100%) followed by e-journals (83.2%), e-books (77.7%) and online databases (67.2%) for information retrieval for academic purposes. Also, the respondents stated some other resources such as online public access catalogues (OPAC), Oxford University press and thesis libraries and collections (Figure 4).

Table 6. Commonly used Electronic resources

E-resources	YES		NO	
	Frequency	Percentage	Frequency	Percentage
Search engines	274	100	0	0
E-journals	228	83.2	46	16.8
E-books	213	77.7	61	22.3
E-newspapers	171	62.4	103	37.6
E-magazines	139	50.7	135	49.3
Online reference database	184	67.2	90	32.8
E-dictionaries	86	31.4	188	68.6
Others	45	16.4	229	83.6

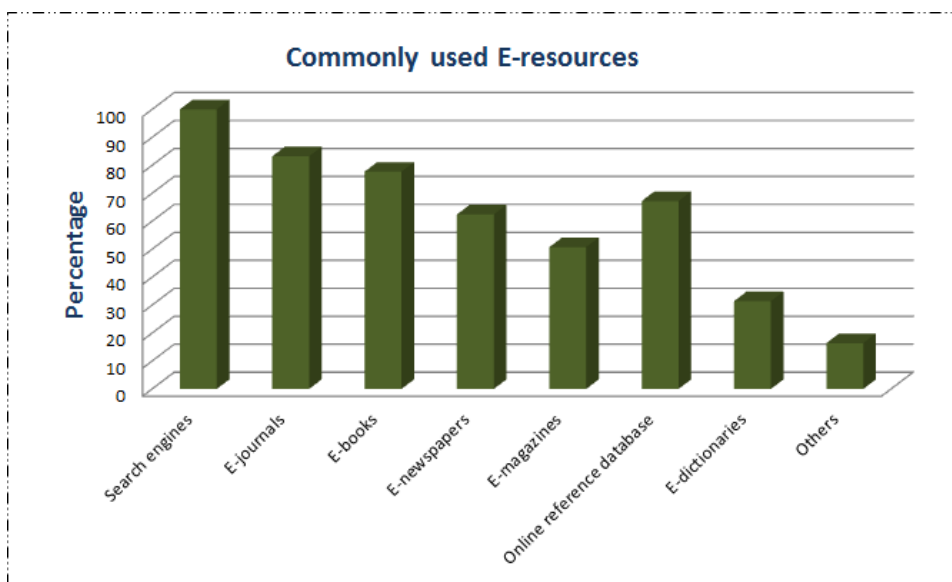


Figure 4. Commonly used electronic resources

**Electronic Resources Satisfaction**

The analyzed feedback of the respondents indicated that (69%) of them were satisfied and (17.5%) were very satisfied with the provided e-resources in the university. However, only a few percentage of the respondents (5.8%) are not satisfied, whilst (7.7%) were neutral (Table 7).

Table 7. Level of satisfaction

Level	Frequency	Percentage
Very satisfied	48	17.5
Satisfied	189	69.0
Not satisfied	16	5.8
Don't Know	21	7.7
Total	274	100



**Motivations for Using Electronic Resources Usage**

The results (Table 8) show that major respondents agreed that the quick retrieval to information from different locations and at any time, accompanied with easy access to wide range of up-to-date journal articles and books are considered the main motivating factors for academics to use e-resources and databases (Figure 5).

**Table 8.** Motivations for using electronic resources.

Motivations	Agree		Disagree	
	Frequency	Percentage	Frequency	Percentage
Provide a quick retrieval to information	252	92.0	22	8.0
Easy to use	219	79.9	55	20.1
Low cost	187	68.2	87	31.8
Access from different locations	231	84.3	43	15.7
The ability of using library resources remotely and outside opening hours.	153	55.8	121	44.2
Provide access to a wide range of journal articles	245	89.4	29	10.6
Provide access to a wide range of books	216	78.8	58	21.2
Provide access to up-to-date articles	261	95.3	13	4.7
Provide access to the reliable information resources	198	72.3	76	27.7

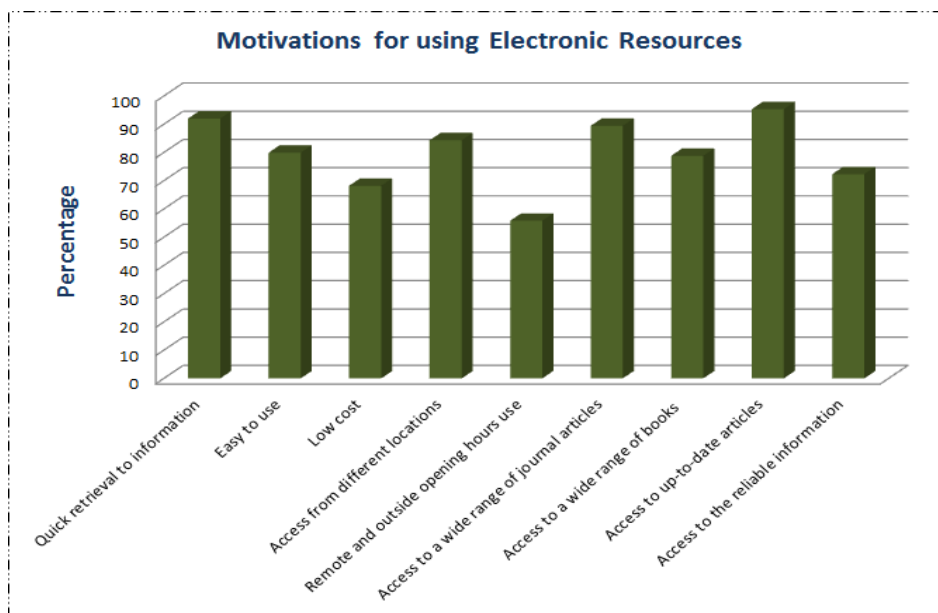


Figure 5. Motivations for using electronic resources.

**Challenges and Hindrances of Using E-Resources**

The results of asking respondents about the challenges that they could face during using e-resources are presented in Table 9. It is obvious that lack of technical knowledge (68.6%), lack awareness of e-resources (56.2%)

and lack of online access (34.3%) in addition to language barriers (49.6%) are the major factors that could hinder the usage of e-resources (Figure 6). Other factors that are added by respondents include lack of materials that relevant to the field as well as lack of knowledge about the availability of the access to specific e-resources and database by the university. Frequent use of e-resources may lead to mental and eye exhaustion for some elder users. The results also showed that the technical factors, such as facilities (e.g. computer), power supply, and speed of internet services don't affect greatly on the usage of e-resources in the PNU.

Table 9. Challenges to electronic resources usage

Challenges	Agree		Disagree	
	Frequency	Percentage	Frequency	Percentage
Lack of online access	94	34.3	180	65.7
Inadequate facilities (e.g. computers)	13	4.7	261	95.3
Slow of internet services	7	2.6	267	97.4
Lack the technical knowledge	188	68.6	86	31.4
Lack the awareness of e-resources	154	56.2	120	43.8
Language barriers	136	49.6	138	50.4
Irregular power supply	0	0	274	100
Others	146	53.3	128	46.7

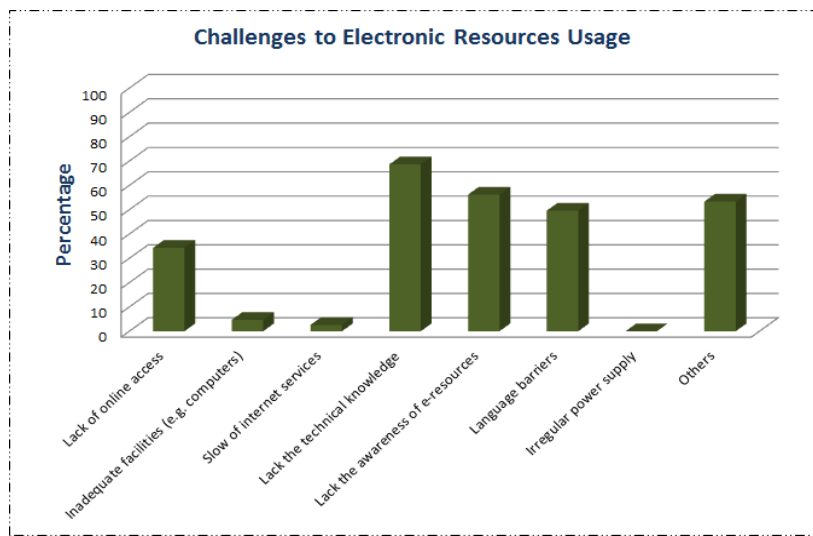


Figure 6. Challenges to electronic resources usage

**Discussion**

Based on the main and detailed objectives of the study, the results of the survey distributed among the academic staff in PNU revealed that the electronic resources are of no doubt is the preferred choice of information retrieval among the PNU staff members of various disciplines. The majority of the academics are aware that the university provides access services to the e-resources and databases for the purposes of research, self-education, skills and curriculum development to achieve the mission and vision of the university. The use of e-resources in conducting research is considered the main purpose stated by the respondents, and this is evident in the forms of obtaining previous studies and literature searching in order to support the theoretical framework of their research, developing the field of specialization, improving research capabilities and skills, learning about all new to obtain new research topics, identifying new researchers in the field of specialization, in addition to teaching students and learning about the latest models and advanced experiences in the world. This is consistent with the findings of the studies of Al-Zafairi (2013) and Sujatha & Murthy (2010).

Moreover, the study showed that the majority of academic staff used mainly their offices and laboratories for e-resources access in daily and weekly patterns with available access at the central library and university housing but of less frequency. The results also exhibited less attention to off campus access to e-resources due to many factors such as irregular and slow internet services, irregular power supply in addition to the unavailability of essential technical facilities to access the e-resources in some cases.

These results revealed that the use of e-resources is so critical for academics during their work hours from their labs and offices because it enables them to access information very quickly, facilitates the answer to any immediate scientific inquiries, helps in the following up the latest scientific developments in the field of specialization, and increases motivation to research, work and achievement. Thus, the availability of e-resources and online databases in the offices and laboratories of academic is very essential to help them to achieve their teaching, learning and research goals easily without any hindrances. This is consistent with the findings of the studies of Rajeh (2003).

The findings also revealed that the use of e-resources can improve the teaching ability and positively benefit the whole educational process through strengthening the relationship between the students and teachers. In addition, the use of e-resources and online databases by students improve their skills which has a great impact on their academic performances. This is consistent with the findings of studies of Ergart (2002) and Adeniran (2013). Furthermore, it was obvious that the preferred used e-resources are search engines, e-journals, e-books and online databases for information retrieval for academic purposes which is consistent with the results of studies of (Ibrahim, 2004; Ramayah, 2006; Omotayo, 2010; Thanuskodi, 2010).

In terms of satisfaction, only a few academic staff was not satisfied with the e-resources provided by the university. The satisfaction of academics is obtained due to the ease and quick retrieval to updated information from different locations at any time which also motivate the academic staff to mainly rely on e-resources and databases in education and scientific research purposes. These results are compatible with findings obtained from different studies reported by Tella et al. (2018), and Ansari and Zuberi (2010).

The hindrances of using were recorded obviously due to many factors, such as the lack of technical knowledge, awareness of e-resources, online access and language barriers. This hindrance is mainly distributed among staffs of low academic ranks (e.g. demonstrators and lecturers of bachelor and master qualification. These factors might be the main causes that responsible for the loss of their satisfaction (Al-Zafairi, 2013; Al-Debian, 2011). It was noted that the staff members in some colleges of humanities (Arts, Education and Social Services), whose teaching is mainly in the Arabic language could face some language barriers which hinder their use of non-Arabic databases (Gordon, & Santman, 1981). Moreover, Elder staff members could face some exhaustion and health problem with frequent long term use (Omotayo, 2010).

### **Conclusion and Recommendations**

The electronic resources are of no doubt the preferred choice for getting up-to-date and current information. The access to e-resources would improve the research activities and research outputs, decrease the cost of the information retrieval with efficient delivery of information economically to all users in addition to enhancing the computing, and communication networks which leads to strengthening the collaboration among academic researchers. At PNU, academic staffs depend on the e-resources for improvement their teaching, learning and research outputs. The majority of academics are aware and satisfied with the e-resources services offered by the PNU. Some challenges were discovered and the following recommendations were suggested:

1. The University should subscribe to different online databases and e-resources to cover all courses run by the university.
2. Regular training workshops on how to use and access to electronic resources/databases should be organized by the university for academic staffs of different specialties to improve their knowledge and skills for effective and efficient usage of e-resources.
3. University libraries should inform the university academic members with the new databases through periodical notes.
4. Increase marketing strategies for electronic information access and retrieval systems.
5. Involving faculty members from various scientific disciplines in the process of selecting electronic databases in accordance with their scientific and research needs, taking into account the balance between databases of different scientific disciplines.

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