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Predictors Influencing University Academics' Scholarly E-Journals Use Behavior

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Abstract

Purpose

The study aimed to investigate the influence of demographic characteristics, research productivity, Internet use, and digital literacy skills on academics' e-journals use behavior.

Design

The design of the study was quantitative, and a survey method was used to achieve the objectives of the study. The University of the Punjab was chosen as a setting of the study because of its high ranking in academic and research output among public sector universities of Pakistan. The targeted population of the study was academics working on contractual and regular basis in Lahore based campuses of University of the Punjab. The questionnaire was distributed to 949 academics, out of which 108 academics were on leave and 457 questionnaires were returned back with a response rate of 54 %.

Findings

The findings of the study indicated that demographic characteristics, research productivity, and digital literacy skills significantly affect academics e-journals use behavior.

Originality

Previous researchers mostly focused on investigating academic scientists' scholarly information seeking behavior and their relationship with demographic variables. This is a unique study and fills the gap in literature by examining influence of demographic factors, Internet use, research productivity and digital literacy skills on academics' e-journals use behavior.

Implications

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The findings might be helpful for University of the Punjab departmental librarians to make strategies to improve academics digital literacy skills in relation to the use of advanced searching techniques and evaluation of the quality of e-journals. The results could also be beneficial for public universities with similar population, disciplines and academic programs of University of the Punjab.
Keywords: E-Journals, Factors, Academics, University of the Punjab, Scholarly Information Seeking

Introduction

Academics use a variety of information sources for their academic and scholarly activities including print, electronic and informal. However, there is a growing trend of using electronic information sources by academics and research scholars. Academic staff was found to mostly rely on e-journals, e-databases and full-text articles to carry out their scholarly endeavors. E-journals are primary source of knowledge and constitute a significant portion of scientific and technical literature. University libraries struggle to meet researchers' needs for e-journals relevant to their subject. Studies were conducted to examine academics and researchers' scholarly use patterns of e-journals (Abdullah et al, 2015; Tenopir, Wilson, Vakkari, Talja and King, 2010; Nicholas, Rowlands, Huntington, Jamali and Salazar; 2010).

Academic staff scholarly information seeking behavior and use of e-journals demonstrated that use of e-journals varied due to demographic, contextual, human and economic factors (Pullinger, 1999; & Rowland, Bell and Falconer, 1997). Jamali and Nicholas (2008) examined astronomers' and physicists' scholarly information seeking behavior in relation to methods of keeping up-to-date and finding articles. They also explored the relationship between academic status and research field of users with their information seeking behavior. Vakkari and Talja (2006) conducted a nationwide survey of Finish end users of Finish National Digital Library to analyse the influence of academic status and discipline on major search methods used by academic researchers and teachers. Niu and Hemminger (2012) examined academic scientists' information seeking behavior and correlation of personal and environmental factors on academics' information seeking behavior. Overall, many factors were found to affect the specific information seeking behaviors of scientists, including demographic, psychological, role-related, and environmental factors.

Previous researchers mostly focused on investigating academic scientists' scholarly information seeking behavior and their relationship with demographic variables. However, there appears to be lack of studies on investigating the influence of demographic characteristics, Internet use, digital literacy skills and research productivity on academics' e-journals use behavior from a variety of

disciplines - arts and humanities, economics and management sciences, law, commerce, Islamic studies, sciences, life sciences, engineering and technology, and oriental languages etc. This is a unique study and fills the gap in literature by examining the influence of demographic factors, Internet use, research productivity and digital literacy skills on academics' e-journals use behavior, including purposes of e-journals use, methods used to find e-journal articles and means of accessing e-journal articles.

Literature Review

Researchers explored academics' use patterns of e-journals and e-databases and also investigated the relationship of demographic variables and information seeking behavior. Jamali and Nicholas (2008) looked at differences and similarities between different research areas within physics and astronomy with regard to two aspects of information-seeking behaviour, including methods used for keeping up-to-date and methods used for identifying articles. The study revealed the differences among subfields of physics and astronomy in relation to information-seeking behavior and emphasized the need for and the value of looking at narrower subject communities within disciplines for a deeper understanding of the information seeking behavior of scientists. The influence of academic status and discipline on major search methods used by academic researchers and teachers was analysed (Vakkari and Talja, 2006) in a nationwide survey of Finish end users of Finish National Digital Library. The findings of the study showed that keyword searching in databases was more common in the disciplines of natural sciences, engineering and medicine than any other discipline. Academic status and discipline influenced the trends of search methods used by academic staff and researchers.

In 2010, Tenopir, Wilson, Vakkari, Talja and King conducted a survey of academic staff's scholarly e-reading patterns in Australia, Finland and United States from 2004 to 2007. The findings of the study revealed that there was less variation in reading patterns of e-articles across countries and more within disciplines. Academic staff who published more also read more e-journal articles. Personal characteristics of the readers including age and academic status had much less influence on academic staff's reading patterns of e-articles.

Rowlands and Fieldhouse (2007) in a review study investigated users' scholarly information seeking behavior. The key findings of this study were that specialties or disciplines were the most useful unit of analysis for studies of scholarly communication than studies at the individual or journal level.

Pullinger (1999) stated that academic use of electronic journals was influenced by many factors such as user's discipline, their role and levels within the university, their local information environment of print and electronic resources,

awareness of those resources and their information needs on a particular day. Borrego, et al. (2007) also confirmed the importance of discipline as an explanatory factor of the use of electronic journals. Nicholas et al. (2011) in a report found that researchers across UK universities and research institutions behaved differently in different subjects. Researchers' use patterns of e-journals, including levels of usage, use of gateways and viewing of abstracts varied by subject and by institution even in a same discipline or subject. Borrego et al. (2007) found that age was an explanatory factor in the use of e-journals. Young academic staff were more frequent users of e-journals than older staff (Monopli et al., 2002 and Smith, 2003). Tenopir et al. (2003) stated that use of electronic information resources depended upon gender. Monopli et al. (2002) explored that the male respondents were more frequent users of e-journals than females. Kim (2010) presented findings that males had higher levels of computer self-efficacy than their counterparts. Significant gender differences existed in the use of technology.

Nicholas et al. (2010) noted that institutional differences exist in researchers' use of e-journals. Users in research intensive institutions behaved differently than those in less intensive institutions. Bravo and Diez (2011) also concluded that there were differences of e-journals use patterns in the five Spanish universities analysed. Termens (2008) conducted a study on the use of electronic journals licensed by the Consortium of Academic libraries of Catalonia in 2005 and log data of consumption of journal titles in one year was studied. Full time faculty members had access to equal number of journal titles at different institutions, however, results of the study indicated that consumption of journal titles was high in some institutions and even varied within a discipline. Institutional and disciplinary differences were found regarding consumption of journals.

Nicholas, Rowlands, Huntington, Clark and Jamali (2009) mentioned in a report that the use of e-journals is strongly and positively correlated to papers published, number of Ph.D. research awards and research grants. King et al. (2009) also found that academic staff, who publish more articles tend to read more articles. Researchers reported that academic status, discipline, age, institution, research productivity, contextual, human and economic factors influenced academic staff and researchers' use of e-journals.

Review of above studies depicts that the researchers examined academic scientists' scholarly information seeking behavior and their relationship with demographic variables. However, there appears to be lack of studies on investigating the influence of demographic characteristics, Internet use, digital literacy skills and research productivity on academics' e-journals use behavior from a variety of disciplines - arts and humanities, economics and management

sciences, law, commerce, Islamic studies, sciences, life sciences, engineering and technology, and oriental languages etc. This is a unique study and fills the gap in literature by examining the influence of demographic factors, Internet use, research productivity and digital literacy skills on academics' e-journals use behaviour, including purposes of e-journals use, methods used to find e-journal articles and means of accessing e-journal articles.

Objectives of the Study

The objectives of the study are as follows:

1. The study aims to investigate the influence of demographic factors – gender, education, academic designation, and discipline - on academics'journals use behavior i.e., purposes of using e-journals, means of accessing e-journal articles, and methods of finding e-journal articles;
2. The study aims to investigate the influence of research productivity, Internet use and digital literacy skills on academics' e-journals use behavior i.e., purposes of using e-journals, sources of e-journal articles used, and methods of finding e-journal articles;

Design of the Study

The design of the study was quantitative, and a survey was employed to achieve the study's objectives. The University of the Punjab was chosen as the setting of the study. According to Higher Education Commission's most recent report in 2016 on quality and research-based ranking of higher education institutes (HEI) of Pakistan, University of the Punjab is ranked second in the category of 'General Universities' among 13 other universities. This ranking of HEI's is based on teaching and research criteria established by Higher Education Commission. University of the Punjab has four campuses, 13 faculties, 10 constituent colleges and more than 66 departments, institutes and colleges. The population of the study comprises academic staff of 12 faculties of the University of the Punjab. The total population of academic staff of four campuses of the University of the Punjab – Quaid-e-Azam, Allama-Iqbal, Gujranawala and Jhelum campus was 1085 at the time of the study. Academic staff work on regular, contract and visiting basis (part-time) at the University. The targeted population of the study was academic staff of Lahore based campuses of University of the Punjab and comprised both contractual and regular faculty members of University of the Punjab. The visiting faculty was not included in the survey. The faculty of medicine had no on-campus students; therefore, it was not included in the survey.

The researchers employed the approach of 'Delivery and Collection Questionnaires' within a self-administered questionnaire for distribution. In a delivery and collection approach, questionnaires are simply delivered by hand to each respondent and collected later. Gray (2014) reported that the delivery and collection approach "has the advantage over postal questionnaires in that there is some direct contact with potential respondents that might in turn induce a greater proportion of people to complete the questionnaire" (p. 246). The response rate is higher through the drop and collect technique as compared to postal and mailed questionnaires. The questionnaire was developed with the help of literature and distributed to all regular and contractual academics of University of the Punjab. The questionnaire was distributed among 949 academics, out of which 108 academics were on leave and 457 questionnaires were returned back with a response rate of 54 %. The validity and reliability of the questionnaire was established before distribution among academics. Content validity is important especially for constructing a new instrument, hence it was decided to send the instrument to subject experts to evaluate the instrument. Modifications were made regarding content, scale and questionnaire layout per their suggestions. There were no recommendations regarding deletion or expansion of any part of the questionnaire. Reliability of the questionnaire was established by measuring the Cronbach's Alpha of questionnaire items with Likert type scale. All the questions with Likert type scale had Cronbach's alpha value varying from 0.7 to 0.9.

Measures

Variables measuring demographics (e.g., gender, education, academic designation, and discipline), research productivity, Internet use and digital literacy skills and 21 items on purposes of e-journals use, means of accessing e-journal articles and methods used to find e-journal articles were collected. All variables were collected as categorical or ordinal measures. Variables of demographics, research productivity, and Internet use were first converted into dummy variables before entered into an ordinal regression equation. However, mean was computed for academics' digital literacy skills. All the assumptions of ordinal regression were fully met before regression analysis. Therefore, only variables within an acceptable range of tolerance and without multi-collinearity were finally entered into the regression equation.

The statements of purposes of e-journal use, means of accessing e-journal articles, methods used to identify e-journal articles and digital literacy skills were developed with the help of relevant literature. The scale used for measuring the statements of purposes of e-journal use, means of accessing e-journal articles, methods used to identify e-journal articles was Likert type scale

from 'Never = 1 to Very Frequently = 5'. The scale used for measuring academics' digital literacy skills was 'Don't Know to Excellent' from 1 to 5 Likert type scale.

Results of Data Analysis - Demographic Characteristics

Table 1 provides the frequency distribution of respondents' demographic characteristics – gender, age, academic designation and academic qualification. It shows a slightly higher percentage of male respondents, n=236 (53 %) than female respondents, n=210 (47 %). Out of 457 respondents, 11 respondents didn't reveal their gender. The respondents were asked to mention their academic designation. Frequency distribution of the respondents' academic designation from Table 4.1 shows that both the 'Lecturers' (n=197) and 'Assistant Professors' (n=182) make up nearly 86 % of the respondents (n=439). There were 29 (7%) Associate Professors and 30 (7%) Professors.

Table 1
Frequency Distribution of Demographic Characteristics N=457

Characteristics	Frequency	Percentages %
Gender		
Male	236	53
Female	210	47
Total (n)	446	100
Missing	11	
Age		
23-33	191	43
34-44	149	34
45-55	79	18
Over 55	23	5
Total	442	100
Missing	15	
Academic Designation		
Lecturer	197	45
Assistant Professor	182	41
Associate Professor	29	7
Professor	31	7
Total	439	100
Missing	18	

Academic Qualification		
MA	54	12
MPhil	182	42
Ph.D.	199	46
Total	435	100
Missing	22	

Frequency distribution of the respondents' academic qualification from Table 1 reveals a higher percentage of Ph.D. respondents 199 (46 %) as compared to both M.Phil., n=182 (42 %), and MA, n=54 (12 %), respondents. It shows a trend of increase in number of respondents with the increase of academic qualification.

Respondents' Discipline

University of the Punjab (PU) offers academic programs under 13 disciplines. The discipline of 'Medicine and Dentistry' had no on-campus academic staff and students; therefore, it was excluded from the targeted population. The results of data analysis show that the highest number of respondents, n=114 (26 %), were from the discipline of 'Science', followed by n=89 (20 %) respondents from the discipline of Life Sciences. The number of academic staff in these disciplines was higher than all other disciplines. Eight respondents were from the discipline of 'Law' and ten from the discipline of 'Islamic Studies'. Respondents from all 12 disciplines of the University of the Punjab participated in the study and that there were more respondents from pure and applied sciences disciplines than the disciplines of Law and Islamic Studies.

Frequency of published journal articles

The respondents were asked to provide information about the number of journal articles they have published. Figure 1 represents the frequency distribution of the respondents' published articles within the last one year.

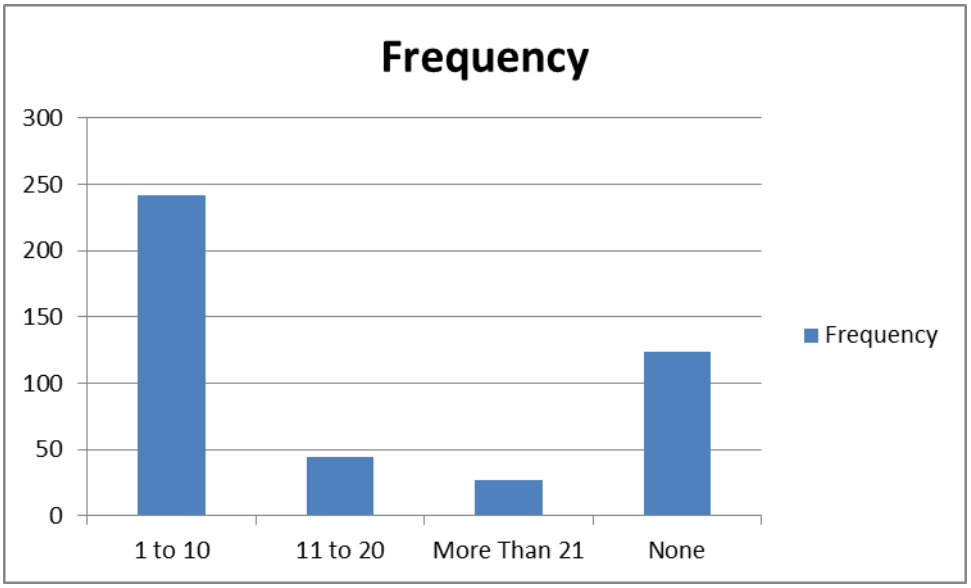

Figure 1 Bar Chart of Published Journal Articles

Frequency of Internet Use

Results of data analysis depict that 159 (37 %) respondents had been using the Internet for 6 to 10 years ago. About 155 (36 %) respondents had been using the Internet for more than 10 years and only 3 respondents were still not using the Internet. Results depict the fact that an overwhelming majority of the respondents were using the Internet for their teaching and research tasks.

Principle Component Analysis of Respondents' E-Journals Use Behavior

The factor analysis of academics e-journals use behavior was performed by using Principal Component Analysis (PCA). Ho (2006) stated that there are two basic methods for obtaining factor solutions. They are 'Principal Component Analysis' and 'Common Factor Analysis'. If the purpose is no more than to "reduce data" to obtain the minimum number of factors needed to represent the original set of data, then Principal Component Analysis is appropriate. Table 2 shows the factor loadings of academics' purposes of using e-journals. To test a set of data for suitability for PCA, Kaiser Meyer Olkin (KMO) test and Bartlett's Test of Sphericity (BTS) are usually applied to confirm if the items were appropriate factors based on the variances. According to Hair, Jr Black, Babin, and Anderson (2010), BTS test of variation of factors is measured from 0.000 to 1.0 and the overall value of KMO should be 0.60 or higher to carry on with

PCA. Table 2 shows the value of 0.723 that is higher than acceptable value. The factors which had high loading values above 0.5 were further chosen for ordinal regression.

Table 2
Principle Components of Purposes of Using E-Journal Articles

Purposes of using e-journals	Loadings
Teaching and instruction	.613
Writing journal articles	.790
Writing conference papers	.789
Writing theses	.640
Supervising researchers	.792
Writing research project reports	.841
Keeping up to date with your subject	.641

Bartlett's test of sphericity was significant (χ2 (21)=1077.43, p=0.000).
Kaiser-Meyer-Olkin measure of sampling adequacy was high (KMO=0.837).

Table 3 shows the factor loadings of academics' sources of accessing e-journal articles. The factors which had high loading values above 0.5 were further chosen for ordinal regression.

Table 3
Principle Components of Accessing Sources of E-Journal Articles

Sources	Loadings
General search engine (e.g., Google, Alta Vista….etc.)	.772
Articles through Google Scholar	.719
Open access e-journals websites (Free web journals)	.722
Higher Education Commission e-journals	.591
Articles on author's personal website	.625
Provided by a colleague	.603
Personal subscription	.758
Journals subscribed by department library	.674
Full text databases (e.g., Medline, PsyInf, ….etc.)	Cross-loading

Bartlett's test of Sphericity was significant (χ2 (36) = 600.835, p=0.000).
Kaiser-Meyer-Olkin measure of sampling adequacy was high (KMO=0.776).

Table 4 shows the factor loadings of academics' sources of accessing e-journal articles. The factors which had high loading values above 0.5 were further chosen for ordinal regression.

Table 4
Principle Components of Methods of Identifying E-Journal Articles

Sources	Loadings
Browsing through issues of e-journals	.584
Searching (i.e. by author or title name)	.819
By picking relevant titles from the reference list of other publications	.819
Through e-mail alerts of chosen journal	.742
Recommendation by a colleague	.787

Bartlett's test of Sphericity was significant (χ2 (10) = 187.757, p=0.000).
Kaiser-Meyer-Olkin measure of sampling adequacy was high (KMO=0.650).

Assumptions of Ordered Logit Regression were fulfilled before regression analysis of academics e-journals use behavior. Variables of demographic characteristics, Internet use, digital literacy skills and research productivity (Independent variables) without multi-collinearity problems were entered in regression equation. VIF values of variables were within acceptable range. Dummy variables of all independent variables except digital literacy skills were created before entering into regression equation.

Ordered logit Regression of Purposes of E-Journals Use

Academics were asked to indicate the frequency of using e-journals for various purposes. To examine the influence of demographic, research productivity,

Internet use and digital literacy skills variables on purposes of using e-journals, ordered logit regression analysis was applied (Table 5). Gender did not have an effect on any purpose of using e-journal articles. Education had a significant effect on academics' purposes of using e-journals. It is interesting to note that academics with MA education were using e-journal articles for writing articles, conference papers and research reports more than MPhil and Ph.D. academics. Respondents of MPhil education were using e-journal articles for writing papers/articles, conference papers and research reports more than Ph.D. academics.

Discipline of academics affected negatively on their purposes of using e-journals. Respondents of Life sciences were using e-journal articles for writing articles, conferences papers and keeping themselves up-to-date less than respondents of all other disciplines. Respondents of Pharmacy discipline were using e-journal articles for writing articles less than respondents of all other disciplines. Academic designation had no effect on respondents' purposes of using e-journal articles. Research productivity affected negatively on respondents' purposes of using e-journal articles. Internet use experience did not have an effect on purposes of e-journal use; however, respondents' digital literacy skills significantly affected respondents' purposes of e-journals use.

Table 5

Variables*	Writing articles estimates	Conference Paper estimates	Research reports estimates	Keeping-up to-date
Gender				
Male=1 Female=0	.035	-.168	.242	-.011
Education				
MA	1.967***	1.980***	1.830***	.950
MPhil	1.235***	1.100**	.960**	.728
Ph.D.	.216	.085	.404	.174
Discipline				
Behavioral & Social Sciences	-.977	-.533	.050	-1.106
Economics and Management Sciences	-.376	-.188	.323	-.665
Arts and Humanities	-.229	-.291	.226	-.928
Commerce	-1.495	-1.058	-.713	-.829
Law	.377	.914	-.031	-.034
Oriental Learning	-1.387	-.797	-.075	-1.174
Engineering and Technology	-.235	-.461	-.538	-.479

Life Sciences	-1.334**	-1.097	-.1360**	-1.517**
Science	-.683	-.631	-.323	-.755
Pharmacy	-1.675*	-.544	-.259	-1.271
Education	-.709	-.117	-.629	-.736
Islamic Studies	1.559	1.040	1.928	.076
Academic Designation				
Lecturer	-.485	-1.064	-.464	-.279
Assistant Professor	.246	-.726	-.130	.086
Associate Professor	.107	-.571	.029	.113
Professor	.476	-.251	.047	.881
Research Productivity (Articles Published)				
1-10	-1.453***	-.997***	-.625**	-.258
11-20	-1.433***	-1.504***	-.914**	-.525
More Than 21	-1.698***	-1.038**	-.703	.066
Internet Use Experience				
1-5 Years	-.368	.553	-.366	-.183
6-10 Years	-.183	.183	-.053	-.406
More than 10 Years	-.453	.002	-.463	-.704
Digital Literacy Skills	.580***	.630***	.830***	.664***

Ordered Logit Regression of Purposes of E-Journals Use

Ordered logit regression of academic library user activities
*Dependent variables are the frequency of doing the library activities described in the column headings on a five–point scale, from “never” to “very frequently.”
*Significant at 0.05.
**Significant at 0.01
***Significant at .000

Ordered Logit Regression of Means of Accessing E-Journal Articles

Academics were asked to indicate the frequency of accessing various means of e-journal articles on a five point likert scale (Never=0 to Very frequently=5). To examine the influence of demographic, research productivity, Internet use and digital literacy skills variables on means of accessing e-journal articles, ordered logit regression analysis was applied (Table 6). Gender did not have an effect on means of accessing e-journal articles. Education affected significantly on academics’ means of accessing e-journal articles. Respondents with MA education were accessing e-journal articles through author’s website more than respondents of MPhil and Ph.D. education.

Discipline of academics had significant negative effect on their mean of accessing e-journals articles. Respondents of Life sciences were accessing e-journal articles through full-text databases less than respondents of all other disciplines. Academic designation had significant positive effect on respondents' means of accessing e-journal articles. Associate professors were accessing e-journal articles through search engines more than respondents of all other designation. Research productivity and Internet use experience did not effected on respondents means of accessing e-journal articles; however, respondents' digital literacy skills significantly affected respondents' frequency of accessing various means of e-journal articles. Respondents with good digital literacy skills were accessing more e-journal articles through search engines, author's website, provided through colleagues, subscribed through department and full-text databases.

Table 6

Variables*	Search engines estimates	Authors' website estimates	Provided through colleagues estimates	Departmental subscription estimates	Full-text databases estimates
Gender					
Male=1 Female=0	.314	.083	-.158	.086	-.085
Education					
MA	.084	1.132*	.813	.433	.043
MPhil	.098	.443	.245	.560	.009
Ph.D.	-.285	.061	.041	.070	-.218
Discipline					
Behavioral & Social Sciences	.194	-.043	.055	.153	-1.007
Economics and Management Sciences	.338	-.056	-.106	-.654	-.594
Arts and Humanities	.177	-.768	-.614	-.094	-.359
Commerce	-.719	.250	-.021	-2.260	-.221
Law	.116	.133	-.198	-1.032	.266
Oriental Learning	.282	-1.249	.479	.101	-.438
Engineering and Technology	-.424	.071	-.502	-.095	-.063
Life Sciences	-.543	-.051	-.268	-.288	-1.515**
Science	-.320	-.410	-.260	-.406	-.332
Pharmacy	-.354	.837	.103	-.625	-1.357
Education	.211	.080	-.033	-.311	-1.123
Islamic Studies	.125	1.014	-.415	-.215	.012

Academic Designation					
Lecturer	.671	-.372	-.432	-.479	-.553
Assistant Professor	1.221	-.228	.007	.116	-.521
Associate Professor	1.720*	.146	.766	.088	-.510
Professor	1.428	-.958	-.014	-.056	-.590
Research Productivity (Articles Published)					
1-10	-.064	-.129	-.447	-.351	-.426
11-20	-.019	-.240	-.287	-.601	-.395
More Than 21	.393	-.449	-.293	-.380	-.296
Internet Use Experience					
1-5 Years	-.081	.347	.072	-1.382	-.193
6-10 Years	.362	.352	-.013	-.920	.135
More than 10 Years	-.367	.218	-.078	-1.066	-.003
Digital Literacy Skills	.844***	.690***	.465**	.440**	1.238***

Ordered Logit Regression of Means of Accessing E-Journal Articles

Ordered logit regression of academic library user activities
*Dependent variables are the frequency of doing the library activities described in the column headings on a five–point scale, from “never” to “very frequently.”
*Significant at 0.05.
**Significant at 0.01
***Significant at .000

Ordered Logit Regression of Methods of Finding E-Journal Articles

Academics were asked to indicate the frequency of methods used to find e-journal articles. To examine the influence of demographic, research productivity, Internet use and digital literacy skills variables on methods of finding e-journal articles , ordered logit regression analysis was applied (Table 7). Gender has significant positive effect on respondents’ methods of finding e-journal articles. Male respondents were finding e-journal articles through chaining method (Reference List) more than female respondents. Education has no effect on respondents’ methods of finding e-journal articles. Discipline of academics affected negatively on their methods of finding e-journal articles. Respondents from the discipline of Behavioral and Social Sciences, Commerce, Oriental Learning and education were finding e-journal articles through ‘Browsing’ method less respondents of all other disciplines. Lecturers were finding e-journal articles through Chaining method (Reference List) less than Assistant Professor, Associate Professors and Professors. Research productivity affected negatively on respondents’ methods of finding e-journal articles.

Internet use experience did not effect on methods of finding e-journal articles; however, respondents' digital literacy skills significantly affected respondents' methods of finding e-journal articles. Respondents with good digital literacy skills were finding e-journal articles more through Browsing, Searching, E-Mail alerts and Chaining Method (Reference List).

Table 7

Ordered Logit Regression of Methods of Finding E-Journal Articles

Variables*	Browsing estimates	Searching estimates	E-Mail alerts estimates	Reference List
Gender				
Male=1 Female=0	.182	.149	-.033	.699**
Education				
MA	.493	-.190	.076	.500
MPhil	.172	-.413	.376	-.326
Ph.D.	-.024	-.170	.228	-.244
Discipline				
Behavioral & Social Sciences	-1.132*	.045	-.490	-.751
Economics and Management Sciences	-1.004	-.218	-.539	-.063
Arts and Humanities	-.610	-.312	-.295	-.160
Commerce	-1.682*	-.934	.108	-.937
Law	.079	.163	.321	.758
Oriental Learning	-1.696*	-.662	.053	-.519
Engineering and Technology	-.444	-.711	-.231	-.855
Life Sciences	-.483	-.320	-.682	-.239
Science	-.621	-.458	-.426	-.370
Pharmacy	-.500	1.018	-.803	-.044
Education	-1.378*	.104	.371	-.505
Islamic Studies	-.370	1.280	.768	-.027
Academic Designation				
Lecturer	-.383	-.432	-.552	-1.254*
Assistant Professor	-.132	-.102	-.565	-1.104
Associate Professor	.459	-.464	.221	-.837
Professor	-.204	-.137	-.466	-1.112
Research Productivity (Articles Published)				
1-10	-.085	.005	-.726**	.012
11-20	-.738	-.073	-.419	-.719
More Than 21	-.572	.083	-1.813***	-.581

Internet Use Experience				
1-5 Years	-.663	-.498	-.217	.000
6-10 Years	.003	-.127	-.367	.024
More than 10 Years	-.242	-.758	-.348	-.230
Digital Literacy Skills	.725***	.728***	.516***	.669***

Conclusion

The study aims to measure the influence of demographic characteristics, research productivity, Internet use, and digital literacy skills on academics' e-journals use behavior of University of the Punjab. Demographic characteristics – gender, education, discipline and academic designation and research productivity, Internet use, and digital literacy skills were used as independent variables. The purposes of e-journals use, means of accessing e-journal articles and methods used to find e-journal articles were dependent variables. Previous literature shows that researchers examined the academic scientists' information seeking behavior and correlation of personal and environmental factors on academics information seeking behavior (Niu and Hemminger, 2010). Overall, many factors were found to affect the specific information seeking behaviors of academic scientists, including demographic, psychological, role-related, and environmental factors. Jamali and Nicholas (2008) examined Astronomers and Physicists scholarly information seeking behavior in relation to methods of keeping up-to-date and finding articles. They also explored the relationship between academic status and research field of users with their information seeking behavior.

However, there appears lack of studies investigating influence of demographic variables, research productivity, Internet use, and digital literacy skills on academics' e-journals use behavior in a variety of disciplines like arts and humanities, economics and management sciences, Islamic studies, engineering and technology, education, law commerce and oriental languages. This study fills the gap of previous literature by examining the influence of demographic characteristics, research productivity, Internet use, digital literacy skills on academics' scholarly e-journals use behavior in a variety of disciplines.

The results of present study show that demographic characteristics, research productivity and digital literacy skills significantly affect academics e-journals use behavior. Academics Internet use did not affected on their e-journals use behavior. However, a major finding from this study indicate that academics' digital literacy skills represent a significantly more powerful predictor than all demographic variables, research productivity and Internet use on academics' e-journals use behavior – purposes of use, means of accessing e-journal articles

and methods used to find e-journal articles. Present study findings show that respondents' gender, education, discipline, academic designation, research productivity and digital literacy skills appeared significant predictors of scholarly e-journals use behavior.

Findings show that academics of education MA and MPhil were using e-journals for writing scholarly articles, conference papers and research reports more as compared to Ph.D. academics. Academics with good digital literacy skills were using more e-journals for writing articles, conference papers and research reports. Academics of MA education were accessing e-journal articles through author's website more than MPhil and Ph.D. academics. Academics with good digital literacy skills were accessing more e-journal articles through search engines, authors' website, provided through colleagues, departmental subscription and full-text databases. Male academics were finding e-journal articles through reference list (chaining method) more than female academics. Lecturers and Assistant Professors were finding e-journal articles through reference list (chaining method) more than Associate Professors and Professors. Respondents with good digital literacy skills were finding more e-journal articles through searching, browsing, provided through colleagues and chaining method.

The study findings contribute to the body of existing knowledge and reveal the influence of demographic factors as well as research productivity, and digital literacy skills on academics' scholarly e-journals' use behavior. The findings might be helpful for University of the Punjab departmental librarians to make strategies to improve academics digital literacy skills in relation to use of advanced searching techniques and evaluation of the quality of e-journals. As the study results suggest that academic education, discipline, research productivity and digital literacy skills are the more significant influencing factors of e-journals use behavior; these are the areas where information professionals can involve in assisting academics for better e-journals use.

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