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## Information Discovery and Scholar Networking as Modes of Scholarly Communication: A Comparative Study

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# **Information Discovery and Scholar Networking as Modes of Scholarly Communication: A Comparative Study**

## **Abstract**

This study sought to investigate information discovery and scholar networking as modes of scholarly communication across researchers in the Arab region. An online survey was distributed in December 2020 using the Google form. The questionnaire also includes the following elements: (a) what are the researchers' purposes of using electronic resources; (b) how do researchers look for and access scholarly material and (c) what methods of networking are mostly used for scholar connection. The findings revealed no significant differences across the groups, even when it comes to gender and respondents' discipline, it is clear that ResearchGate is the most popular among them all. Researchers holding degrees in Humanities and educational sciences like to use research platforms (M=4.37) more than social media (M=3.87). Moreover, the popularity of using Google Scholar and Google in scholarly field are confirmed in line with previous evidences. There are highly significant differences across researchers regarding their behaviours in accessing scholarly material. Results suggest that respondents don't consider researcher platforms like ResearchGate & Academia.edu as social media. It might be explained by the fact that research platforms like ResearchGate and Academia.edu are organized and designed for research purposes in a way that Facebook, Twitter and Instagram are not.

**Keywords:** Electronic resources; information discovery; scholar networking; scholarly communication; researchers; Arab countries.

## **Introduction**

Conducting research in the twenty-first century has improved dramatically, deeply affected by many recent changes such as the rapid development of technologies that are now applied in most research activities. With McLuhan's (1962) prediction of living in a "global village," the term indicates the concept of also having whatever and information we need at any time in our hands. With no limits or borders, knowledge can flow across nations through different channels and mediums all over the world.

### **Key points**

- During the work of the research, it is clear that new scholarly communication strategies are adopted by Arab researchers
- Yemini researchers are most likely to use non-paid databases to search and find scholar material and Jordanian are the least across the group, closely followed by accessing materials via open access databases.
- Arab researchers harmoniously chose using Google to search and find scholar material, closely followed by using university-paid databases.
- Methods of accessing scholar materials differ among the group, Saudi researchers are less likely to choose contacting authors asking for full texts of their studies using ResearchGate or Academia.edu, while Moroccan researchers are on the opposite.
- Although the social media is currently highly-used for networking, most researchers consider conferences and research platforms like Research Gate and Academia.edu. more likely to build scholar connections than social media.

Research communication has witnessed an unprecedented output in the last two decades. Various media in different forms and limitless scholarly potential and published contributions have significantly expanded as a part of globalisation trends (Anderson & Hodges, 2015; Cullen & Chawner, 2011; Pinfield, 2015; Prosser, 2003). However, while profound changes have occurred in the realm of scholarly communication, the process of research itself has remained stable with four remarkable stages: attribution, peer review, dissemination and access, and scholarly preservation (European Commission, 2019).

The widespread use of information and communication technologies has expanded and changed the functions of scholarly communication. New technologies like cloud techniques, research communications platforms, new document formats, open source software, digital repositories, and various paths of accessibility (Arshad & Ameen, 2021; Huvila, 2020; Brody, 2006) have increasingly affected the processes of research and the world of brain researchers (Abrizah, 2009; Ameen, 2017; Jamali et al., 2020; MacGregor et al., 2014). These technologies have enhanced societies' growth and increased the productive research movement, and can be integrated into libraries, research institutions, universities, and open-source platforms if a strong cooperation is built. *Databib* is one of the most interesting research data repositories. It is a collection catalogue of 500 research dataset repositories that librarians and other information professionals have identified as easy to use and browse by users (Databib, 2021). Such digital repositories support the integrity and development of research activity. Most smart repositories provide machine interfaces, RSS, open search, linked data and social networks (O'Donnell, 2020; Clobridge, 2014; MacGregor et al., 2014) where librarians, researchers, students, data centers, and software developers can integrate with each other effectively (Villanueva & Shiri, 2021). Since the beginning of the 2000s, global literature has revealed studies on using electronic

resources, techniques, and platforms that are greatly increasing the global contributions of research and scholarship. Several studies have investigated scholarly communication practices (Nicholas et al., 2020a; Ameen, 2017). Many of these studies looked for open scholarship in various disciplines within the sciences and social sciences (Day et al., 2020; Jamali et al., 2020; White & King, 2020; Schultz, 2017), and another group of studies has looked at scholarly communication attitudes and behaviours among early career researchers (Jamali et al., 2020; Nicholas et al., 2020a; Nicholas et al., 2020b). However, through a review of Arab scholarly literature, we found a few studies that looked specifically at scholarly communication mediums, the means of looking for and finding scholarly material (Farraj, 2019; Nicholas et al., 2019), and researchers' attitudes and practices towards accessing scholar material via open access databases (Al-dwairi & Abutayeh, 2021; Farraj, 2019; Marouf & Anwar, 2010). Al-Dwairi and Abutayeh study (2021) revealed that 34% of respondents preferred open access articles, 30% books; 16% theses and dissertations, while only 12% preferred conference proceedings. Farraj's study (2019) investigated the research data repositories in Saudi universities and the management of open data services that allow all researchers to communicate and employ the research data services for scholarly activities, and focused light on the misuse of data repositories that have been established to support scholar communication environment, and making researchers' contributions accessible for readers at no cost across the country.

A set of principles that should define scholarly communication was proposed as follows: scholarly communication, accessibility, maximum usability, and accommodating an expanding range of scholarly contributions (data, software, new documentary forms, etc.). In scholarly communication practices, the Sloan international study didn't consider country differences to trust articles (Arshad & Ameen, 2021; Jamali et al., 2014). It was found that academics and researchers from developing countries are more likely to be discriminated against in their scholar communication practices by developed countries even when deciding where to publish; as a result, they were less likely to use self-archiving databases, repositories, and social media (Nicholas et al., 2020b; Davis, 2015; Dryden, 2012) as a result this may affect the authenticity of using these platforms for scholar networking, and build difficulties in finding and accessing the scholarly material they needed (Kamali et al., 2020; Katabalwa, 2016). However, looking-for-information and accessing article sources behaviours are easier and more flexible for scholars from developing countries than they had been in the past, particularly in regard to the availability of various means of knowledge networking (Tariq, 2020; Van-Klyton, 2020). Despite the availability of rich and numerous options for accessing documentary materials around the world, third-world countries still have constraints in terms of research scholarship and communication, especially in regard to inadequate competencies to practice research activities (Jamali et al., 2020; Kamali et al., 2020; Nowell et al., 2020), poor IT infrastructure, and limited access to digital resources (Katabalwa, 2016).

Adopting scholarly communication channels/tools such as Google Scholar, ResearchGate, academia.edu, institutional repositories, and social media platforms have become a mode of disseminating scholarly work (Dryden, 2014; García-Vera et al., 2015; Nicholas et al., 2020); with such open-source platforms, the ability to share, contribute, and publish scholarly material for free to audiences becomes possible (Dutta & Paul, 2014; Hansen, 2012; Jihyun, 2011). The topic of open access was also taken into consideration in scholarly communication studies, which found that open access articles have a significantly higher citing rate than non-open access articles. While over 90% of articles are self-archived (Swan & Brown, 2004), the disappointing confirmation that was revealed in Fitzgerald & Jiang's (2020) research was that 71% of the respondents sampled had not made their contributions open access. This is also consistent with Rodriguez's (2014) finding that only 28.2% of academics had published in repositories or open access journals. These statistics reveal how important it is to encourage disciplinary and departmental support for increasing open access contributions (Jihyun, 2011); the metrics of citing and impact factor statistics aid in enhancing the open access movement.

### **Study objectives and hypothesis**

The main objective of the current study is to establish whether researchers' scholarly communication behaviours are universal or have country-specific and diverse in their scholar communication activities and practices in regard to finding and accessing information resources, and formal scholar networking. Thus, the findings presented in this paper examine if there are statistically significant differences across the countries compared. Therefore, the objectives of the study will be as follows:

- a) To determine the similarities in the researchers' purposes of using electronic resources and their practices of finding and accessing scholar materials;
- b) To identify the differences of scholar networking methods across researchers;
- c) To investigate and contrast researchers' scholarly communication behaviours and suggest possible initiations and interventions.

To mark the significant differences among the groups of researchers in nine countries in the Arab world, the following hypotheses will be tested:

**H<sub>0</sub>**. There is no statistically significant difference among groups' means ( $p \leq 0.05$ ).

**H<sub>a</sub>**. At least one group's mean is statistically different from another ( $p \leq 0.05$ ).

### **Limitations of the study**

The current study aims to evaluate the differences and similarities of researchers' use of e-resources, particularly their manner of accessing e-resources, looking for particular scholarly information, and citation references behaviours, as well as their scholarly communications practices. The researchers were able to identify some major limitations; first, the geographical area is restricted to Arab countries, and second, due to the various

means of distribution (Email, Facebook, Twitter, and LinkedIn), a response rate cannot be calculated.

## **Methodology**

Because of its importance in scientific research, objectivity in any research investigation cannot be conducted without following a very systematic plan. The researchers began conducting this project by paying more attention to the issue of scholarly communication, which is a gap in the communication and librarianship literature in the Arab world. The study aims to establish whether researchers' scholarly communication behaviours in regard to finding and accessing information resources, and formal scholar networking are uniform or have statistically significant differences as a result of national and cultural factors.

The current study compares researchers' information discovery and scholar networking practices across nine countries in the Arab region: Syria, Jordan, Iraq, Saudi Arabia, Yemen, Egypt, Algeria, Libya, and Morocco. The number of successful responses to the online survey was 599.

To achieve the objective of this study, we designed a survey that was peer-reviewed by a group of experts and pilot tested before being distributed online. The sample of researchers was randomly selected from different universities and institutions in nine countries in the Arab region. The survey was available online in Arabic in December 2020 through a Google Drive link. The link of the survey was posted on different means of communication (e-mail, Facebook, and Twitter). This survey measured different demographic characteristics including gender, age, highest degree earned, and also assessed the following elements: (a) researchers' purposes of using e-resources ; (b) how they search for, find, and access scholar material; and (c) what are the most popular methods used for scholarly communication. The survey data were collected, transferred from MS Excel to a SPSS sheet, and then analysed.

The reliability score of any study tool should be between 0.60 and 0.97 to obtain stable responses each time (Hair et al., 2006); therefore, Cronbach's alpha of the Likert questions in the study was calculated with the formula:

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}} \quad (1)$$

Our total was 0.765, which means that the multiple-question Likert scale survey is reliable. The normality of data distribution was then calculated measuring the means, standard deviations, and skewness values, and both estimates remained within the 95% Confidence Intervals. As mentioned by Piovesana and Senior (2018), sample sizes greater than 85 are found to generate stable means and standard deviations regardless of their level of skewness, whereas smaller samples require skewed distributions. Thus, we considered means and standards deviation values for measuring the normality of data distribution. In addition, the data analysis included a cross-tabulation with frequency, percentages, and

mean values, and the data was found to be normally distributed. A parametric ANOVA test was run to compute the p-value to analyse group mean differences (Siegel, 2012; Kim, 2017), and a post-hoc follow-up ANOVA test was computed using Tukey's HSD test for pairwise comparisons.

To obtain the P-value, we must know its position in the distribution to which it belongs through F-distribution. The F-distribution comes along with ANOVA (Archdeacon, 1994) to determine whether the intergroup's variance is larger than the variability of the intragroup's variance (Bailey, 2008; Kim, 2017). Hence, we calculated the F value with the formula:

$$(F \text{ value} = \frac{\text{Larger sample variance}}{\text{smaller sample variance}} = \frac{\sigma_1^2}{\sigma_2^2}) \quad (2)$$

The F-value and P-value of each item in the Likert questions in the survey are given in tables (3, 4, and 5) . For calculating the data that are found not normally distributed, we applied the Kruskal-Wallis test (Table 2) to mark significant differences (Elliot, 2006; Nath & Pavur, 1985). For measuring Likert questions, the options are completely agree, agree, neither agree nor disagree, disagree, and completely disagree. The mean values were calculated based on their numerical values (from 1 to 5). Each country was compared with the other eight by running a Tukey's HSD post-hoc test; to avoid long tables, a few features are displayed in graphs and tables to check the multiple differences. The ANOVA tables include mean and standard deviation values of each country that are separated with a comma (M, SD). The last two columns include F-statistics and P-value ( $\alpha = 0.05$ ).

## **Findings**

### ***Demographics***

A total of 599 out of 650 respondents from nine countries completed the online survey successfully. Researchers from Jordan made up the largest percentages (234, 39.1%), followed by Egypt (74, 12.4%), Algeria (64, 11%), Iraq (64, 10.7%), Libya (54, 9.5%), Saudi Arabia (36, 6%), Morocco (34, 5.7%), and Syria and Yemen equally (18, 3%).

Out of the total numbers of researcher respondents, 257 (45%) are females and 315 (55%) are males. This gender distribution is given in Table 1. Of the 599 respondents, 77 (14%) are professors, 54 (10%) are associate professors, 76 (13%) are assistant professors, 121 (21%) are lecturers, 70 (12%) are researchers, and 174 (30%) are post-graduate students. More demographic characteristics of the respondents such as age, highest degree earned, and subject are provided in Table 1.

### **Table 1**

#### ***Demographic Characteristics of Respondents***

| Category/Country             | Jordan | Syria | Iraq | Saudi Arabia | Yemen | Egypt | Algeria | Libya | Morocco | Total N | Total % |
|------------------------------|--------|-------|------|--------------|-------|-------|---------|-------|---------|---------|---------|
| <b>Gender</b>                |        |       |      |              |       |       |         |       |         |         |         |
| Female                       | 86     | 15    | 26   | 8            | 0     | 42    | 38      | 36    | 6       | 257     | 45      |
| Male                         | 140    | 0     | 37   | 26           | 18    | 32    | 17      | 18    | 27      | 315     | 55      |
| <b>Age</b>                   |        |       |      |              |       |       |         |       |         |         |         |
| <30                          | 35     | 5     | 14   | 0            | 0     | 24    | 13      | 5     | 9       | 105     | 19      |
| 31–35                        | 32     | 8     | 10   | 0            | 4     | 15    | 18      | 9     | 8       | 104     | 18      |
| 36–40                        | 42     | 0     | 3    | 8            | 0     | 6     | 10      | 18    | 4       | 91      | 16      |
| 41–45                        | 38     | 0     | 14   | 10           | 14    | 12    | 8       | 10    | 4       | 110     | 19      |
| 46–50                        | 43     | 0     | 9    | 10           | 0     | 8     | 2       | 7     | 8       | 87      | 15      |
| >50                          | 36     | 2     | 13   | 6            | 0     | 9     | 4       | 5     | 0       | 75      | 13      |
| <b>Subject</b>               |        |       |      |              |       |       |         |       |         |         |         |
| Sciences                     | 5      | 0     | 6    | 0            | 0     | 0     | 1       | 8     | 0       | 20      | 4       |
| Education                    | 84     | 0     | 9    | 8            | 0     | 4     | 4       | 3     | 2       | 114     | 20      |
| Arts                         | 41     | 6     | 5    | 12           | 10    | 39    | 6       | 15    | 16      | 150     | 26      |
| Administration and Economics | 37     | 0     | 8    | 0            | 4     | 2     | 6       | 2     | 0       | 59      | 10      |
| Engineering                  | 14     | 0     | 8    | 0            | 0     | 0     | 4       | 16    | 0       | 42      | 7       |
| Medicine                     | 2      | 0     | 0    | 0            | 0     | 0     | 0       | 2     | 0       | 4       | 2       |
| Nursing                      | 1      | 0     | 0    | 0            | 0     | 0     | 0       | 0     | 0       | 1       | 1       |
| Religions                    | 4      | 1     | 2    | 2            | 0     | 0     | 0       | 0     | 1       | 10      | 2       |
| Laws                         | 1      | 0     | 6    | 0            | 4     | 2     | 0       | 0     | 14      | 27      | 5       |
| Journalism and Media         | 4      | 0     | 2    | 2            | 0     | 4     | 4       | 0     | 0       | 16      | 3       |
| Information Technology       | 14     | 4     | 1    | 2            | 0     | 10    | 15      | 2     | 0       | 48      | 8       |
| Other                        | 19     | 4     | 16   | 8            | 0     | 13    | 15      | 6     | 0       | 81      | 14      |
| <b>Highest Degree Earned</b> |        |       |      |              |       |       |         |       |         |         |         |
| Doctorate                    | 141    | 4     | 30   | 24           | 10    | 33    | 33      | 17    | 0       | 292     | 51      |
| Master                       | 72     | 11    | 22   | 8            | 8     | 28    | 14      | 28    | 33      | 224     | 39      |
| Bachelor                     | 13     | 0     | 11   | 2            | 0     | 13    | 8       | 9     | 0       | 56      | 10      |
| <b>Job Position</b>          |        |       |      |              |       |       |         |       |         |         |         |
| Professor                    | 26     | 0     | 14   | 8            | 10    | 3     | 8       | 0     | 8       | 77      | 14      |
| Associate Professor          | 41     | 0     | 2    | 2            | 0     | 3     | 0       | 6     | 0       | 54      | 10      |
| Assistant Professor          | 39     | 0     | 8    | 10           | 0     | 10    | 0       | 9     | 0       | 76      | 13      |
| Lecturer                     | 35     | 8     | 20   | 8            | 0     | 20    | 15      | 15    | 0       | 121     | 21      |
| Researcher                   | 36     | 2     | 2    | 4            | 4     | 8     | 5       | 5     | 4       | 70      | 12      |
| Post-graduate Student        | 49     | 5     | 17   | 2            | 4     | 30    | 27      | 19    | 21      | 174     | 30      |

### Purpose of using e-resources

In the survey, respondents indicated their purposes for using e-resources. The total number of researchers who answered the question about using e-resources for teaching-learning purposes is 581 out of 599. Researchers in Syria have the highest percentage (16, 88.9%) followed by those in Algeria (52, 83.9%) and Saudi Arabia (30, 83.3%), while the lowest values are given from researchers in Libya (42, 76.4%), Yemen (10, 71.4%), and Morocco (18, 60%) (Figure 1).

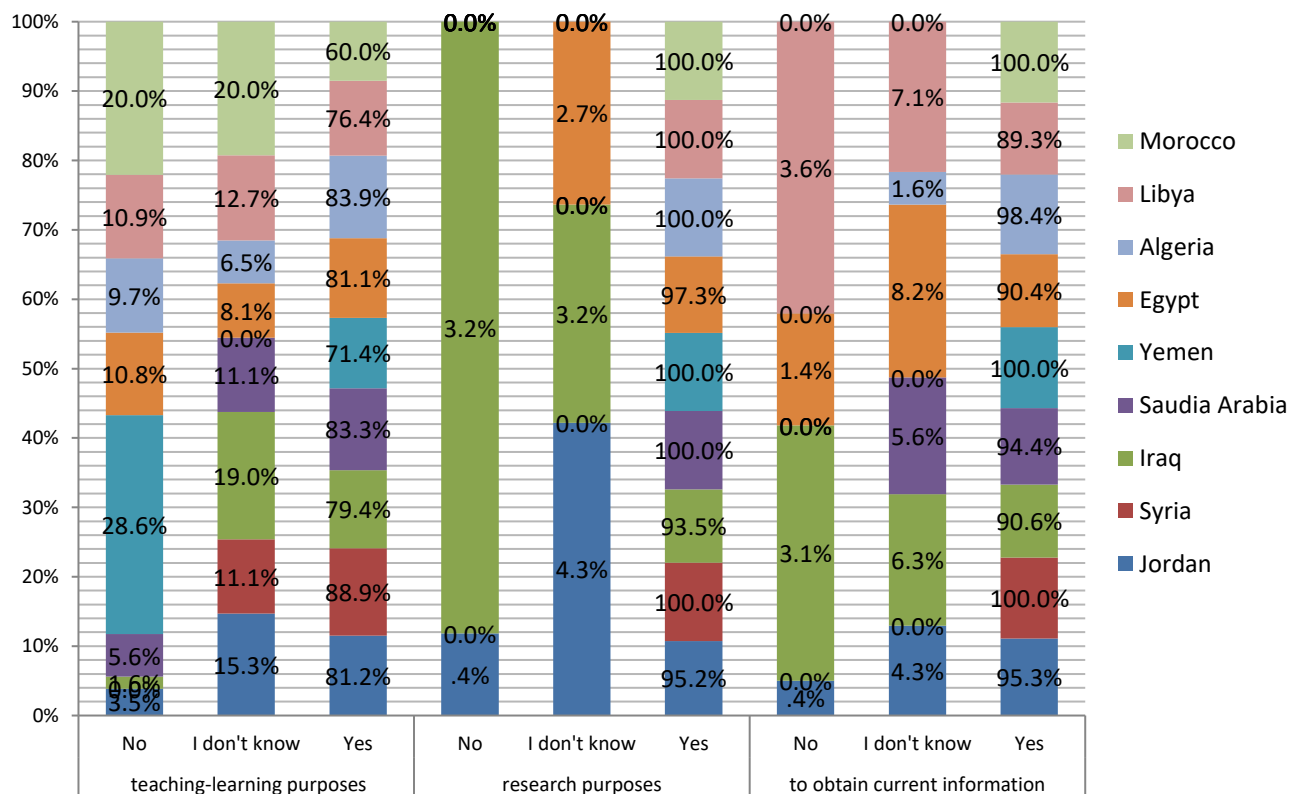
As respondents indicated in their responses to the survey, the most common purpose of using e-resources is for research (Figure 2). The total number of researchers who answered that they use e-resources for research purposes is 594. The results show no significant differences (Asymp. Sig = 0.139, df = 8) when comparing the eight countries at alpha level



( $\alpha < 0.05$ ) (Table 2). All respondents from Syria (18), Saudi Arabia (36), Yemen (18), Algeria (64), Morocco (34), and Libya (57) access e-resources for research purposes. In addition, Egypt (72, 97.3%) Jordan (220, 95.2%), and Iraq (58, 93.5%) had the highest percentages for participants using e-resources for research (Figure 2). If we look at the results in another way, comparing the total percentages of respondents use e-resources, we found a few faculty members indicated that they don't yet use e-resources. This might be explained by the fact that they use another types of resources like traditional resources, or for lack of technical skills. Only a small proportion respondents indicated that they don't use e-resources for research purposes., Majority of the researchers use e-resources for the most common features, which are well-known for everyone, as follows: obtaining up-to-date information, free availability, searching facilities, ease of use, accessibility and quick retrievability. The overall results, however, suggest that most of researchers, academic or non-academic are interested in using e-resources for different purposes that serve their tasks within research, obtaining current information and learning- teaching purposes. The findings revealed no significant differences across the groups.

**Figure 1**

*Do You Use e-resources for Learning-teaching, Research or obtaining current information Purposes?*



The number of respondents who answered that they use e-resources for obtaining current information is 564 out of 599. The results revealed that the Asymp. Sig = 0.126 and df = 8 (Table 2); therefore, the null hypothesis H0 is accepted because there is no significant difference across the groups' means. All respondents from Syria (18), Yemen (18), and Morocco (34) use e-resources for obtaining information. Respondents in Algeria (63, 98.4%), Jordan (223, 95.3%), Saudi Arabia (34, 94.4%), Iraq (58, 90.6%), Egypt (66, 90.4%), and Libya (50, 89.3%) access e-resources to be up-to-date with subject information (Figure 1).

As with previous items, a Kruskal-Wallis test was run to measure the p-value, and the test revealed no significant differences (Asymp. Sig = 0.096, df = 8) in the purposes of using e-resources across Arab countries (Jordan, n = 234; Syria, n = 18; Iraq, n = 64; Saudi Arabia, n = 36; Yemen, n = 18; Egypt, n = 73; Algeria, n = 64; Libya, n = 56; Morocco, n = 34; total = 597). The null hypothesis H0 is thus accepted.

### Looking for information

Researchers spend most of their time in information-seeking information activities as one of the main tasks and essentially associated with conducting a research.

Researchers were asked about searching for and finding scholarly materials. Based on the results of the ANOVA and Tukey's HSD tests, there are significant differences among the proportions of researchers who are most likely to use a certain medium of searching for and finding scholarly material in terms of country (Table 2). Nicholas et al (2017) show in their study that “Google and Google Scholar were the most commonly services used among researchers”, in contrast with using university subscribed paid-databases. Therefore, we sought to confirm these findings. The findings, indeed, confirm the popularity of Google Scholar and Google among respondents (M= 4.4, F= 6.03, Sig= 0.000). Respondents from Syria indicated that they trust using search engines such as Google to look for information. Respondents from Syria (M = 4.62, SD = 0.50) has the highest value in the groups, while the lowest mean value is respondents from Morocco (M = 4.05, SD = 0.95), followed by those in Saudi Arabia, (M = 4.11, SD = 1.00).

**Table 2**

*Mean (SD), F, and P-values of Behaviours of looking for and find Scholarly Material*

|  | Jordan     | Syria      | Iraq       | Saudi Arabia | Yemen     | Egypt      | Algeria    | Libya      | Morocco    | Total      | F     | sig   |
|--|------------|------------|------------|--------------|-----------|------------|------------|------------|------------|------------|-------|-------|
|  | M, SD      | M, SD      | M, SD      | M, SD        | M, SD     | M, SD      | M, SD      | M, SD      | M, SD      | M, SD      |       |       |
| I rely on non-paid databases like google scholar to search and find scholar material | 4.22, 0.83 | 4.77, 0.42 | 4.23, 0.90 | 4.33, 0.75   | *5.0, 0.0 | 4.55, 0.64 | 4.67, 0.47 | 4.50, 0.50 | 4.52, 0.70 | 4.40, 0.74 | 6.036 | 0.000 |

|   |               |               |               |               |               |               |               |                |               |               |      |           |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|------|-----------|
| I use search engine like Google to search and find scholar material | 4.26,<br>0.87 | 4.62,<br>0.50 | 4.41,<br>0.67 | 4.11,<br>1.00 | 4.50,<br>0.51 | 4.58,<br>0.74 | 4.42,<br>0.70 | 4.45,<br>0.68  | 4.05,<br>0.95 | 4.34,<br>0.81 | 2.64 | 0.00<br>7 |
| I use university paid-databases                                     | 4.28,<br>0.71 | 4.44,<br>0.98 | 4.03,<br>0.93 | 4.44,<br>0.69 | 4.44,<br>0.51 | 4.24,<br>0.91 | 4.14,<br>0.87 | *3.61,<br>0.83 | 4.41,<br>0.70 | 4.20,<br>0.82 | 5.72 | 0.00<br>0 |
| <i>Total N</i>  | 234           | 18            | 64            | 36            | 18            | 74            | 64            | 57             | 34            | 599           |      |           |

We determined F-statistics and P-values of each item as follows: using non-paid databases to search and find scholar material ( $F = 6.03$ ,  $Sig = 0.000$ ), using search engine like Google to search and find scholar material ( $F = 2.64$ ,  $Sig = 0.007$ ), and university paid-databases ( $F = 5.72$ ,  $Sig = 0.000$ ) (Table 2). Therefore, the null hypothesis  $H_0$  is rejected.

Nicholas et al. (2019) declared in their research Google Scholar has truly established itself in the field, which agrees with the findings in the current study. In addition, the highest score that Google Scholar has, may be, a reflection of its features; its flexibility of search, widespread of subject covering, citing facilities and linking bibliographic records of studies to their sources are the most advantages that researchers found in Google Scholar rather than any research platform. Although utilizing Google scholar and Google for looking for and finding scholar material across the groups are the highest marks, the variance of answers and not getting higher marks may indicate that these platforms are not always able to disseminate the valuable full text needed. Finally, Google Scholar use was highest across researchers ( $M = 4.22 \sim 5.00$ ), and this might be explained by the fact that there is a lack of availability of accessing university subscribed paid-database outside the university network/from home in most of Arab countries and shortage of budget to widening subscription to more databases.

### Accessing scholarly material

As consequence of previous dimension, we found that Google Scholar is the most frequent platform used among researchers for accessing scholar material despite differences among countries. Yemeni and Syrian researchers rely on open access journals like Google Scholar for accessing scholar material ( $M = 5.00$ ,  $SD = 0.00$ ;  $M = 4.77$ ,  $SD = 0.42$ ), which might be explained by the fact that the two countries are currently suffering from war that effect the whole life, as a result no enough budget will be available to make databases subscription. As a result, this led researchers in both countries to look for alternative resources of information to conduct their studies. Jordanian and Iraqi researchers use Google Scholar the least ( $M = 4.22$ ,  $SD = 0.83$ ;  $M = 4.23$ ,  $SD = 0.9$ ), despite the difference of the use of Google Scholar for accessing scholar material, it remains the highest platform that is used among others, which may be explained by the fact of the effective features that this platform offer to users as previously mentioned.

**Table 3***Mean (SD), F, and P-values of Behaviours of accessing Scholarly Material*

|  | Jordan     | Syria      | Iraq       | Saudi Arabia | Yemen      | Egypt      | Algeria    | Libya      | Morocco    | Total      | F     | sig   |
|--|------------|------------|------------|--------------|------------|------------|------------|------------|------------|------------|-------|-------|
|  | M, SD      | M, SD      | M, SD      | M, SD        | M, SD      | M, SD      | M, SD      | M, SD      | M, SD      | M, SD      |       |       |
| I rely on open access like Google scholar                                    | 4.22, 0.83 | 4.77, 0.42 | 4.23, 0.90 | 4.33, 0.75   | *5.0, 0.0  | 4.55, 0.64 | 4.67, 0.47 | 4.50, 0.50 | 4.52, 0.70 | 4.40, 0.74 | 6.036 | 0.000 |
| I rely on university paid-databases  | 4.28, 0.71 | 4.44, 0.98 | 4.03, 0.93 | 4.44, 0.69   | 4.44, 0.51 | 4.24, 0.91 | 4.14, 0.87 | 3.61, 0.83 | 4.41, 0.70 | 4.20, 0.82 | 5.72  | 0.000 |
| I contact authors for a copy of their studies via Research Gate or @academia | 3.56, 1.06 | 3.33, 0.97 | 3.82, 0.91 | *2.77, 0.79  | 4.33, 0.84 | 3.41, 1.00 | 3.85, 1.00 | 3.22, 1.10 | 4.11, 0.84 | 3.57, 1.05 | 7.68  | 0.000 |
| I use other ways to access articles  | 3.35, 1.04 | 3.44, 0.98 | 3.62, 0.98 | 2.94, 1.09   | 3.55, 1.14 | 3.04, 1.11 | 3.79, 1.14 | 3.26, 1.40 | 3.88, 0.84 | 3.39, 1.11 | 4.22  | 0.000 |
| <i>Total N</i>   | 234        | 18         | 64         | 36           | 18         | 74         | 64         | 57         | 34         | 599        |       |       |

Contacting authors through ResearchGate and Academia.edu platforms has the least score as a method deployed for accessing scholar material. Although it is commonly used among researchers to get scholar connections and give the chance to get in contact with authors directly, Saudi researchers are less likely to request study copies from authors (M= 2.77, SD= 0.79). We can look at the result in another way, this might be explained by the fact that the request might not be answered due to many possibilities like copyright issues, or assumption of finding no cooperation from the authors side, or it may be explained by the fact that in Saudi Arabia there are a large variety of databases with full text accessibility for researchers that led to no need to request papers from authors through any platform. However, Yemeni researchers show the highest score when asked to what extent they contact authors to request a full-text of their contributions, Anova (M=4.33, SD=0.84). This finding do confirm our assumptions of lack of adequate information for them in their country due to the political instability and lack of budget that is essential for supporting research and academic institutions.

We identified F-statistics and P-values of each item as follows: using open access like Google scholar (F = 6.036, Sig = 0.000), using university paid-databases (F= 5.72, Sig= 0.000), requesting a copy of the research from the author via Researchgate or Academia.edu (F = 7.68, Sig = 0.000), and accessing scholarly materials through other mediums (F = 4.22, Sig = 0.000) (Table 3). The ‘other’ option provided in the question meant that researchers could specify other means of accessing scholar material. A few did so, and methods included self-paid subscription, social media like Facebook and LinkedIn, digital repositories of local institutions, and traditional resources.



|  |            |            |            |             |            |            |             |            |            |            |      |       |
|--|------------|------------|------------|-------------|------------|------------|-------------|------------|------------|------------|------|-------|
| conferences & workshops                          | 4.09, 0.84 | 4.22, 0.64 | 4.12, 0.96 | 4.16, 0.77  | 4.50, 0.51 | 4.33, 0.84 | *4.62, 0.54 | 3.96, 1.01 | 4.47, 0.70 | 4.21, 0.84 | 4.21 | 0.000 |
| Research platforms like ResearchGate & academia  | 3.89, 0.91 | 4.0, 1.08  | 4.18, 0.75 | 3.94, 0.98  | 3.72, 0.46 | 4.37, 0.68 | *4.62, 0.65 | 3.90, 1.20 | 4.23, 0.88 | 4.08, 0.90 | 6.38 | 0.000 |
| Social networks (Facebook, Twitter, Instagram..) | 4.02, 0.88 | 4.0, 0.84  | 4.32, 0.61 | 3.72, 1.05  | 3.94, 0.72 | 3.86, 1.03 | 4.35, 0.91  | 4.01, 1.06 | 4.41, 0.70 | 4.07, 0.91 | 3.38 | 0.001 |
| Google scholar platform                          | 3.99, 0.91 | 3.85, 1.29 | 4.1, 0.85  | 3.72, 0.81  | 4.22, 0.42 | 3.85, 1.02 | 4.32, 0.97  | 4.12, 1.01 | 4.35, 0.69 | 4.04, 0.93 | 2.0  | 0.008 |
| Academic exchange programs                       | 3.59, 1.09 | 3.44, 1.09 | 4.01, 0.84 | *3.22, 0.92 | 3.5, 1.20  | 3.69, 0.97 | 4.04, 0.98  | 3.59, 1.14 | 4.35, 0.77 | 3.71, 1.05 | 4.93 | 0.000 |
| <i>N</i>   | 234        | 18         | 64         | 36          | 18         | 74         | 64          | 57         | 34         | 599        |      |       |

In total, using social networks ( $F=3.38$ ,  $Sig=0.001$ ;  $F= 4.93$ ) and participating in academic exchanges, conferences, and workshops is statistically significant ( $Sig = 0.000$ ;  $F = 4.21$ ,  $Sig = 0.000$ ). However, researchers from Saudi Arabia are less likely to find scholar networking through academic exchange programs ( $M = 3.22$ ,  $SD = 0.94$ ). Even when comparing groups in regards to gender, females are more likely to use research platforms (ResearchGate & Academia.edu) [females ( $N=265$ ,  $M=4.1$ ,  $SD=0.96$ )] than males [males ( $N=327$ ,  $M=4.07$ ,  $SD=0.85$ )] and the opposite in using social media (Facebook, Twitter, and Instagram) for scholarly networking [females ( $N= 265$ ,  $M=3.93$ ,  $SD=0.98$ )] and [males ( $N=333$ ,  $M=4.18$ ,  $SD=0.83$ )] . We utilized Leven’s test to measure differences between genders in using research platforms (ResearchGate & Academia.edu), the results was ( $F=4.138$ ,  $Sig=0.042$ ) which revealed significant differences between the two groups, while no significant differences revealed between the groups in using social media (Facebook, Twitter, and Instagram) for scholarly networking ( $F=2.556$ ,  $Sig=0.11$ ). Overall, the results of the questions related to researchers' scholarly communication behaviours reveal a highly significant difference across countries.

## Conclusions and discussion

In general, the results indicate that e-resources are widely used by researchers in Arab countries. As respondents indicated in their responses to the survey, the most common purpose of using e-resources is for research. Only a small proportion respondents indicated that they don’t use e-resources for research purposes. Majority of the researchers use e-resources for the most common features, which are well-known, as follows: obtaining up-to-date information, free availability, searching facilities, ease of use, accessibility and quick retrievability. The overall results, however, suggest that most of researchers, academic or non-academic are interested in using e-resources for different purposes that serve their tasks within research, obtaining current information and learning- teaching

purposes (Davis, 2015). The findings revealed no significant differences across the groups which is consistent with studies by Arshad & Ameen (2021), Farraj (2019), and Hansen (2012), even when it comes to gender and respondents' discipline, it is clear that ResearchGate is the most popular among them all. Researchers holding degrees in Humanities and educational sciences like to use research platforms (M=4.37, SD=0.8) more than social media (M=3.87, SD=1.2) same as scientists and physicians (Johnson & Howard, 2019).

On the other hand, as we focus on scholarly information discovery. The popularity of using Google Scholar and Google in scholarly field are confirmed (Nicholas et al., 2019; Jamali et al., 2020) most likely to be used, in order, by scientists (M=4.7, SD=0.73), physicians (M=4.5, SD=0.57), journalists (M=4.43, SD= 0.63), education specialists (M=4.35, SD=0.76), administration and economics specialists (M=4.25, SD=0.93). All scores remain high to mark the popularity of Google Scholar use in scholarly field (Jamali et al., 2020; Ameen, 2017; Johnson & Howard, 2019), possibly because it works as an effective quick crawler that gather basic information they need from the web, through supporting them with various of flexible features.

However, there are highly significant differences across researchers regarding their behaviours in accessing scholarly material, in order, as follows: using open access like Google scholar (M=4.4), using university paid-databases (M=4.2), requesting a copy of research from an author via ResearchGate or Academia.edu (M=3.57), and accessing scholarly materials through other mediums (M=3.39). The 'other' option provided in the question meant that researchers could specify other mediums of accessing scholar material. A few did so, and methods included self-paid subscription, social media like Facebook and LinkedIn, digital repositories of local institutions, and traditional resources, but there were variant values and highly significant differences among the respondents in regard to requesting a copy of the contribution directly from authors via ResearchGate or Academia.edu. Despite how beneficial these platforms are in enhancing sharing knowledge, motivating collaboration across nations, and promoting the spirit of research cooperation. Unfortunately, for many decades, there were no research platforms that could gather researchers in the Arab countries to share their competencies and expertise, and to build a scholar network that discuss same regional issues in one regional interface.

Social media, as platforms for scholar communications, goes very much in line with previous studies that did confirm its role in researchers' scholar networking practices (Jamali et al., 2020; Nicholas et al., 2020a; Nicholas t al., 2020b; Jamali et al., 2015). Widespread use of social media platforms in scholar information discovery, scholar dissemination, and discussion of research output. They supplement the research metrics by tracking the number of social mentions of research articles (Saravanan, 2020). Results suggest that respondents don't consider researcher platforms like ResearchGate & Academia.edu as social media Same finding found in Nicholas et al., (2019) and Jamali et

al., (2020) studies. It might be explained by the fact that research platforms like ResearchGate and Academia.edu are organized and designed for research purposes in a way that Facebook, Twitter and Instagram are not.

Finally, it is hoped that this study is beneficial to academic and research institutions to improve with respect scholarly communications, and may help to enhance the field for the researchers and increase research team cooperation across countries. Future surveys may investigate additional questions related to newly researchers' actual attitudes and practices in scholar authorship, publishing or dissemination, open access and collaboration, and the challenges they face in scholarly communication. Overall, it is interesting to better understand the particular values attached to scholarly communication issues of equity, diversity, and inclusion, and consider new trends and tactics that will lead to a more productive research output, knowledge sharing, and exchange of experiences for the enhancement and growth of academia.

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