

استخدام أدوات البحث العلمي المجانية عبر الإنترنت من قبل الباحثين العرب وغير العرب في مجال علم المكتبات والمعلومات: دراسة استكشافية

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المستخلص

تهدف الدراسة الحالية إلى قياس مدى وعي الباحثين العرب وغير العرب في مجال المكتبات والمعلومات بأدوات البحث العلمي المجانية عبر الإنترنت، ومعدلات استخدامها ومميزاتها وطرق اكتشافها، والتي تُعرف بأنها تلك الأدوات التي تستخدم لمساعدة طلاب الدراسات العليا والأكاديميين المهتمين بالبحث العلمي في إعداد بحوثهم بسهولة وأقل تكلفة.

واعتمدت الدراسة المنهج الكمي في جمع البيانات من خلال استطلاع آراء العينة البالغ عددها (256) مشاركا منهم (132) باحثا عربيا و(124) باحثا غير عربي، وأشارت نتائج الدراسة إلى: هناك (66) أداة بحث مجانية متاحة عبر الإنترنت تستخدم في إعداد البحث العلمي.

على الرغم من المزايا التي تقدمها أدوات البحث المجانية عبر الإنترنت ومنها: توفير الوقت والجهد (24.48%)؛ إلا أنه مازال الوعي بهذه الأدوات غير كافٍ من جانب الباحثين العرب في مجال المكتبات والمعلومات (60.6%) مقابل زيادة وعي الباحثين غير العرب بها (93.5%)؛ لذا من الضروري الإعلان عن هذه الأدوات بشكل كافٍ وتدريبها للباحثين العرب في جميع المجالات. وأوصت الدراسة بضرورة إجراء المزيد من الدراسات المتعمقة في المستقبل للوقوف على الجودة الوظيفية لهذه الأدوات وإمكانية اعتمادها في أبحاث علوم المكتبات والمعلومات.

وهذه الدراسة ليست مهمة للباحثين فحسب، بل أيضا لمطوري البرامج ومنتجي هذه الأدوات من أجل التعرف رؤى واحتياجات الباحثين من هذه الأدوات والعمل على تليتها في المستقبل.

الكلمات المفتاحية: البحث العلمي، أدوات البحث العلمي، علم المكتبات والمعلومات، أدوات الويب

2.0 التعليمية، بحوث الإنترنت.



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The major obstacles faced by the researcher during the preparation of the study is the small size of the sample, but with Personal frequent correspondence and the expansion of the study population geographically, this obstacle was safely overcome. On the other hand, the length of time taken to answer the questionnaire by the researchers which affected the study preparation period.

In the future, more studies are needed to assess the functional quality of these tools to judge the extent to which they can be used in scientific research. The future can be creating an academic platform to collect all free online scholarly tools according to the classification determined by the study and made it available for use by researchers. Finally, the academic institutions fully realize that scientific research is the basis for the progress of countries, but the culture of scientific research must evolve through awareness of the latest developments, technologies, and tools available to serve researchers.

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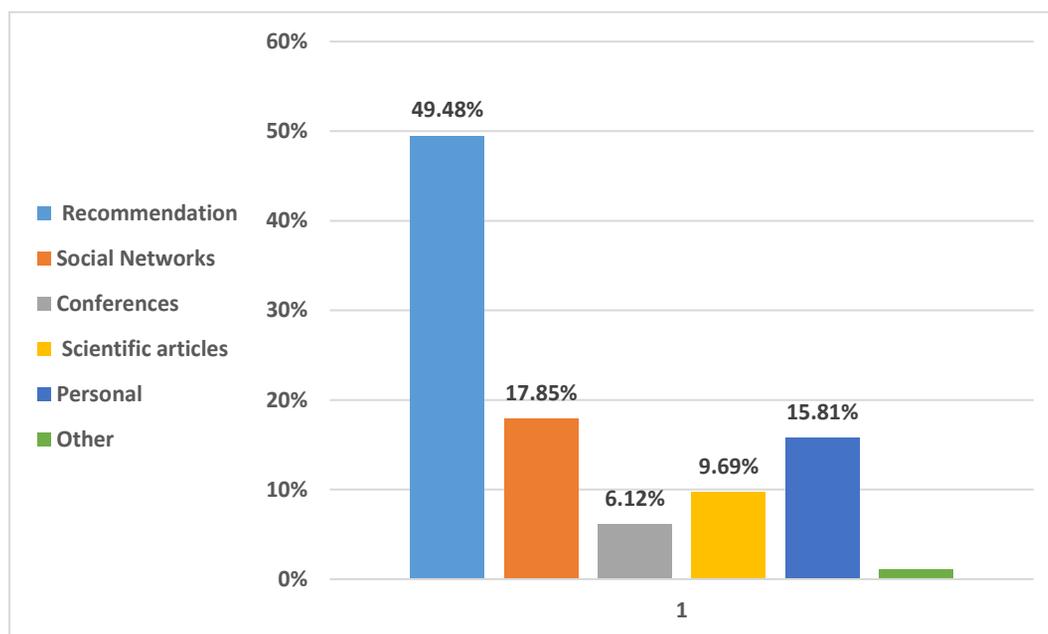


Figure 6. Free Online scholarly tools discover sources.

The recommendation of colleagues or experts is one of the most important sources of the discovery of these tools by (97 = 49.48%) from participants. The second source of knowledge of these tools is from academic social networking. This is indicated by 35 (17.85%) researchers, and others 31 (15.81%) discovered these tools themselves through searching on the Internet. Browsing the published scientific papers was a source for discovering these tools by 19 (9.69%) participants. Conferences and workshops are another source of knowledge confirmed by 12 (6.12%) participants. Finally, two researchers from the participants (1.02%) indicated to two other sources to know about these tools which are search engine results and specialized websites.

10. Conclusion

Free online scholarly tools need to adequately advertise through scientific conferences and seminars as well as research papers and their teaching as a course within the courses of library and information sciences not only the field of libraries and information but also teaching it as a support course for all sciences, academic libraries can take this leadership role through offering training in using these tools and activating it as a service within the basic library services.

their use in the presence of the Internet service. This means that in the absence of an Internet service they cannot be used and if the service is available but unstable (weak) it will affect the usage process and this is meant by the term dependability. Some participants 17 (8.67%) indicated that they do not have the motivation and do not encourage the use of these tools in their scientific research and that many scientific matters make them not interested in them and other participants 20 (10.71%) indicated that all the reasons already are shown in **Figure 5** represent fears and challenges to use these tools and they must be addressed through the recommendations of in-depth studies or the developers of these tools.

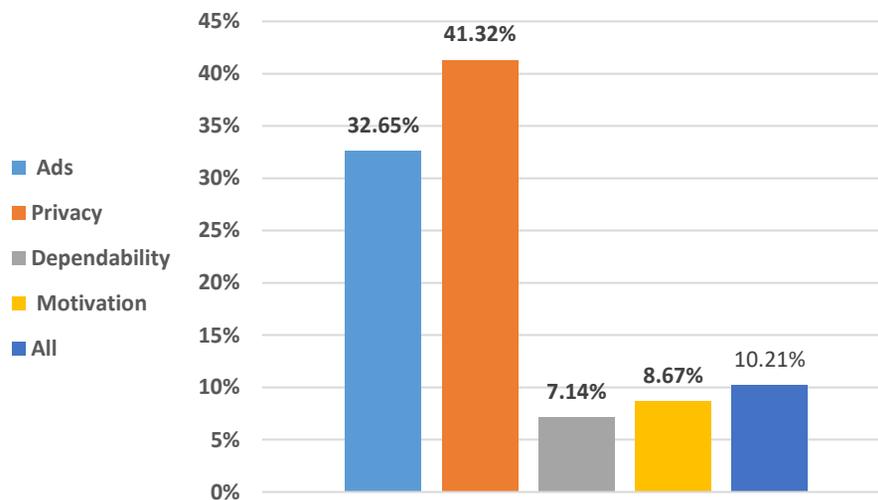


Figure 5. Disadvantages of free online scholar tools.

10. Discover the tools

It was necessary to get acquainted with the sources of discovering free online scholarly tools by the participants to produce results that would be used to determine the best channels for advertising and advertising about these tools. This came through the question put by the researcher in the study questionnaire: **what are the sources of your knowledge about free online scholarly tools?** As shown in **Figure 6** the findings show that there are many sources to discover online scientific research tools by researchers.

feature is efficiency intended to accurately meet the needs of researchers. This feature was chosen by 27 (13.77%) of participants. Some participants 11 (5.61%) believe that all the above are advantages of these tools. All previous advantages were confirmed in a **Kuppusamy (2018)** study.

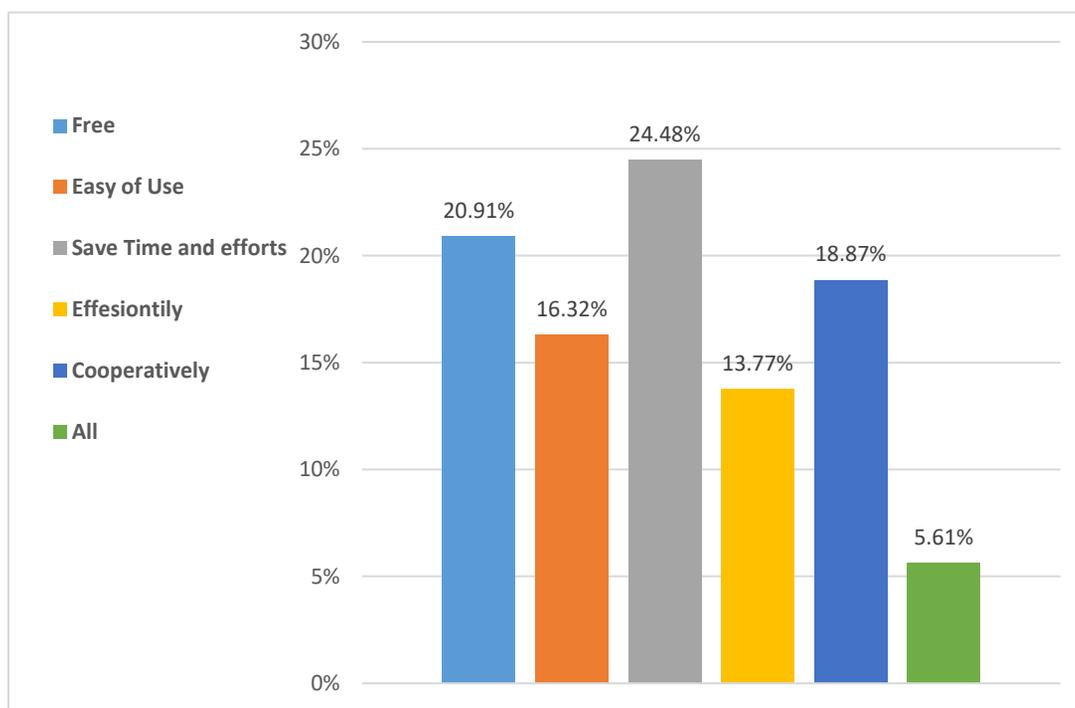


Figure 4. Advantages of free online scholarly tools.

9. Disadvantages of free online scholarly tools

Despite the advantages provided by these tools, they are not without some negatives from the participants' point of view. As showed in **Figure 5**.

Privacy and information security are the main negative aspects of these tools as it is reported by 81 (41.32%) participants and this is a major concern that can hinder the use of these tools, especially if these tools are in the form of add-ons that can be included in the web browser. Also, one of other disadvantages of these tools is ads. which appear in the main interface of the tool and cause annoyance for users, containing advertising, marketing, upgrade versions, or paid public advertisements for goods and products. These ads. can contain inappropriate content and this negativity is confirmed by 64 (32.65%) of participants. While some participants 14 (7.14%) indicate that these tools mainly depend on

Edraw tool is the most used by the participants and the non- Arabresearchers are the most frequent users of these tools with lower usage rates by Arabic researchers. From their point of view most of these tools do not support Arabic content well and indicated that they are satisfied with the charts and drawings provided with built-in Microsoft Word.

Table 14. Data visualization tools

Tools	Google Charts	Mind with Graph	Visually	Easelly	Edraw	Other	Not Use	IUR
Arab	12	0	2	4	8	3	51	29 %36.25
Non-Arab	20	7	10	13	26	9	35	81 %69.82
TUR	32 %16.32	7 %3.57	12 %6.12	17 %8.67	34 %17.34	12 %6.12	86 %43.87	110 %56.12

8. Advantages of free online scholarly tools

Scientific research tools gain acceptance in the academic community as they have a positive impact on enhancing the scientific research process by facilitating cooperative research and crossing geographical barriers to expand the research community (Al-Aufi & Fulton, 2014; Miranda et al., 2013). Figure 4 explains the most important advantages of free scientific research tools in the view of the participants and what each feature means to them.

Saving time and effort is one of the most important advantages of free online scholarly tools. 48 Participants (24.48%) see that this is the main goal for which these tools were designed, and this feature aims to quickly prepare and publish scientific research. The second is the Freebies feature which means use without any fees. This is an appropriate solution for researchers who suffer from a limited budget for their scientific research. This has been confirmed by 41(20.91%) of the participants. The cooperation is one of the features of these tools that were mentioned by 37 (18.87%) participants which mean the ability to perform research and share results collaboratively and to allow researchers to be in constant communication to present and discuss their research ideas. The other feature is the ease of use provided by a familiar web-based interface for users which does not require prior experience to use. This feature has been confirmed by 32 (16.32%) of participants. The last

7.2.11 Online Translation

Linguistic errors and literal translation can be one of the reasons why scholarly papers are rejected when they are peer-reviewed if they are many so the process of checking the language of the translated text must be given attention to be clear to the reader where contribute to the development of consistency and quality in the translation process (Kučiš & Seljan, 2014; Pym, 2010). Now, we find many translation tools available for free via the Internet to achieve this purpose and shown in **Table 13**.

Table 13. Online Translation Tools

Tools	Google Translate	I Translate	Microsoft Bing	Free Dictionary	Other	Not Use	IUR
Arab	35	8	6	13	2	16	64 %80
Non-Arab	41	11	14	10	3	37	79 %68.10
TUR	76 %38.77	19 %9.69	20 %10.20	23 %11.73	5 %2.55	53 %27.04	143 %72.95

Arab researchers use online translation tools the most for preparing scientific research in the English language for publishing in international journals which do not accept submissions in Arabic language. While some of them (16) indicated that they do not use these tools but rather consult specialized dictionaries in printed format or commercial software installed on their computers such as SAKHR and ElWafy software. There are two researches indicated that they use other online translation tools, such as Al-Arabi, Al-Maani, and Babylon. On the other hand, non- Arab researchers are the least who use online translation tools because the English language is the primary language for scientific publishing therefore, they do not need translation tools. There are other translation tools mentioned by non- Arab researchers such as: Oxford online dictionary, Linguee, and Yandex Translate.

7.2.12 Data Visualization (Infographics and Charts)

Scholarly data visualization plays an important role in addressing the problems arising from the large volume of texts and data interpretation in scientific research (Liu et al., 2018). By consulting web search engines for the most popular of data visualization tools. They are monitored in **Table 14**.

	78	57	14	10	11	4	22	174
TUR	٪39.79	٪29.08	٪7.14	٪5.10	٪5.61	٪2.04	٪11.22	٪88.77

It was clear that Google Forms and SurveyMonkey are the tools most used by participants. This is because of the variety of functional characteristics of these tools. For example automatic analysis of responses, diversity of questions, ease of use, multiple forms of templates, sharing results with others, ability to add comments on them, and finally, the ability to convert results into graphs and charts.

7.2.10 Statistics Data

Statistics are one of the most important forms of data used in scientific research. The statistical sources shown in **Table 12** are the most used by researchers in their scientific research.

Table 12. Statistics data sources

Tools	Statista	Google Trends/Statistics	World Bank Open Data	Other	Not Use	IUR
Arab	13	19	4	0	44	36 ٪45
Non-Arab	38	14	25	2	37	79 ٪68.10
TUR	51 ٪26.06	33 ٪16.83	29 ٪14.79	2 ٪1.02	81 ٪41.32	115 ٪58.67

The researcher asked participants the following question: “What are the statistical sources that you use in your scientific research?” and provided them with a list of the most important sites that provide statistics; Statista and the Google statistics website came to achieve the highest usage rate by the participants because this information is constantly updated and reliable where prepared by market and opinion research institutes and data derived from the economic sector and official statistics(Wikipedia, 2020) as well as the ease of searching and browsing statistical data by various metadata elements. The usage rate of statistical sources by Arab researchers (45%) is low compared to that of non- Arab researchers (86.10%) because they are not good at using these tools with a lack of sufficient awareness of them and some are satisfied with the personal surveys that they performed by them to ensure the quality of the final results. Among the other sources of statistics that some participants use are built with trends, Statistics Canada, and the Royal Statistical Society.

researchers achieved the highest percentage usage of the cloud storage tools while some Arab researchers (16) indicated that they do not use any tools for cloud storage instead they use local storage on the computer or external storage media.

Table 10. Cloud storage tools

Tools	Dropbox	Google Drive	I Cloud	BOX	M. One Drive	Other	Not Use	IUR
Arab	14	20	3	9	18	0	16	64 %80
Non-Arab	27	23	12	20	31	3	0	116 %100
TUR	41 %20.91	43 %21.93	15 %7.65	29 %14.79	49 %25	3 %1.53	16 %8.16	180 %91.83

The tools Microsoft One Drive, Dropbox, and Google Drive have achieved the highest usage by researchers because of their security, large storage capacity, and user-friendly interface in addition to the feature that means the user can use it from the mobile application. Perhaps what distinguishes the tool Microsoft OneDrive is that it is directly linked to Microsoft Office to save files automatically in the cloud.

7.2.9 Web Surveys

Web Surveys are a form of the social web application that has overcome obstacles for researchers to collect data and characterized by modernity, speed, breadth of coverage, less expensive, and giving ease of access to the required sample community (Berzelak, Lozar Manfreda, & Vehovar, 2006; Ganassali, 2006; Sounders, Lewis, & Thornhill, 2003). Table 11 showed the most popular web survey tools which were also filtered by (Marrs, 2019; William, 2020) and supported by the latest search results across the web from analyzing the results.

Table 11. Web surveys tools

Tools	Google Forms	Survey Monkey	Type Form	Zoho	SoGo Survey	Other	Not Use	IUR
Arab	46	12	0	0	0	0	22	58 %72.5
Non-Arab	32	45	14	10	11	4	0	116 %100

7.2.7 Selecting Appropriate Journal

The process of selecting the appropriate scientific journal for publishing has become difficult for many researchers due to the presence of many journals in one specialty or subspecialty. Therefore, the process of submitting a paper to a wrong journal is one of the most common mistakes caused by lack of experience (Mukherjee, 2018), with the awareness of this problem some tools have emerged that facilitated the selection process as shown in **Table 9**.

Table 9. Selecting journal tools

Tools	Clarivate Analytics	Elsevier Journal Finder	Springer Journal Suggester	Wiley Journal Finder	Edanz Journal Selector	JANE Tool	SJR Finder	Other	Not Use	IUR
Arab	15	14	3	0	0	0	0	3	45	35 %43.75
Non-Arab	31	27	9	6	8	4	25	2	4	112 %57.14
	46	41	12	6	8	4	25	5	49	147
TUR	%21.46	%20.91	%6.12	%3.06	%4.08	%2.04	%12.75	%2.55	%25	%75

Non- Arab researchers are the most frequent users of online journal selection tools (96.55%) because they have prior knowledge through work discussions whereas Arab researchers are less likely to use these tools (43.57%) due to insufficient awareness of them and the choice of scientific journals for publication on their part depends on the suggestions of colleagues and experts in the field. Clarivate analytics, and Elsevier Journal Finder are the tools most used by participants; because these tools allow finding the appropriate journal for publishing by specifying the specialization or by analyzing the textual content of the research abstract or keywords which saves time and effort on researchers when choosing the scientific journal for publishing.

7.2.8 Cloud Storage Data and Files

Cloud storage tools have become major tools indispensable for any researcher in keeping important files online and researchers resort to these tools to preserve their files from damage or loss (Muchmore, 2019). **Table 10** shows that Arab and non- Arab

academic available in one place without being restricted to a specific specialty (Abdelhamed, 2013). followed by Bing and Yahoo because of the ease of use, accuracy of retrieved results, and offer multiple search options. Despite the popularity of previous search engines there are other highly efficient search engine mentioned by one participant which is Semantic Scholar that contains millions of research papers in all areas of science and unknown by many researchers. Among other web search engines mentioned by (3) researchers and is no longer used strongly at the present time we find Yandex, DuckDuckGo, and Alo. **7.2.6 Online Grammar and Writing Checker**

The online correction languages and writing tools are important in that many researchers adopt them to write without making grammar mistakes. **Table 8** displays the most famous tools.

Table 8. Grammar and writing checker tools

Tools	Grammarly	Spell Checker	EduBirdie	Grammarix	Other	Not Use	IUR
Arab	11	5	0	0	2	62	18 /22.5
Non-Arab	46	17	7	11	2	33	83 /71.55
	57	22	7	11	4	95	101
TUR	%29.08	%11.22	%3.57	%5.61	%2.04	%48.46	%51.53

We conclude that the usage rate of these tools by participants is low (51.53%) for the following reasons; some of them use commercial software with more advanced features, some others are subscribed to the language review service which provided by global publishers and some of them review their paper themselves or the university provides with editing as a free service for them.

The Grammarly tool is one of the most famous tools had the highest rate used by participants because of ease of use it contains a huge linguistic database and provides users with reports on error rate repair and text efficiency. Also, some of the non- Arab researchers indicate that they use other tools that are not listed in the table such as scribes, the IT language tool, and spell-check.

(Gandhi, Vijaya, & Rajavel, 2013). Table 6 shows the channels used by researchers to access information.

Table 6. Channels for open access to information resources

Tools	Academia	Google Books	Microsoft Academic	DOAJ	Wikipedia	YouTube	I Seek	Other	Not Use	IUR
Arab	7	30	4	5	16	11	1	2	4	76 %95
Non-Arab	25	12	9	10	26	20	12	2	0	116 100%
	32	42	13	15	42	31	13	4	4	192
TUR	%16.32	%21.42	%6.63	%7.65	%21.42	%15.81	%6.63	%2.04	%2.04	%97.95

All participants indicated that the tools as supportive sources but the main dependence was on the scientific databases that the university made available to them for free. Wikipedia and Google Books came at an equal use rate and achieve the highest usage rate by participants because that provides credible, updated, and full-text information resources.

7.2.5 Web Search Engines

According to the Statcounter (2020) website, the web search engines shown in Table 7 are the most used around the world for November of 2020, and this was confirmed by (Kurniasih et al., 2018), in their study about the use of search engines by students of library and information science.

Table 7. Web search engines

Tools	Google	Bing	BAIDU	Yahoo	Ask.com	Other	Not Use	IUR
Arab	38	26	0	12	2	2	0	80 %100
Non-Arab	48	40	0	20	6	2	0	116 %100
	86	66	0	32	8	4	0	196
TUR	%43.87	%33.67	%	%16.32	%4.08	%2.04	%	%100

The Google search engine the most used by the participants; because academic search engines it is considered comprehensive, and efficient, where everything scientific and

web pages and 600 million scientific papers, books, newspapers, and journals, as well as a huge bibliography database. As for the Paper Rate tool, it is completely available for free and the researcher can use this tool to do ten checks per month.

7.2.3 Social Platforms

The researchers (85%) believe that social platforms are necessary in academic communication and affect decision-making. (Van Eperen & Marincola, 2011, p. 2). Also, it is a key part of the scientific research process (Baruah, 2012, p. 5). Table 5 shows the usage rates of social media platforms for research purposes.

Table 5. Social platforms tools

Tools	Facebook	Twitter	LinkedIn	Quora	Research Gate	Watsapp	Google+	Other	Not Use	IUR
Arab	20	8	13	5	17	13	2	0	2	78 %97.5
Non-Arab	13	16	26	9	33	8	11	0	0	116 %100
	33	24	39	14	60	21	13	0	2	194
TUR	%16.38	%12.24	%19.89	%7.14	%30.61	%10.71	%6.63	%	%1.02	%98.97

From the previous analysis, it was found that most of the participants were already using social networks in scientific research, where ResearchGate, LinkedIn, and Facebook are considered to be the most popular social tools used by Arab and non-Arab researchers. These statistics come as a confirmation of the statistics contained in the (Elsayed, 2016; Shehata, 2019) study whereas two Arab researchers have reported that they do not use these tools for scientific purposes but for entertainment, recreation, and social communication.

7.2.4 Open Access to Information

Open access to information is a process that made journal articles freely available to anyone anywhere over the World Wide Web and it has become a necessity in scientific research today as it saves researchers the high cost of subscription prices of publishers

famous text editors. On the other hand, some researchers indicate that they use the Web EndNote and commercial tools to manage their references which offer advanced capabilities in managing, storing, retrieving, and coordinating scientific references.

7.2.2 Plagiarism Checker

Plagiarism means not attributing the information source consulted happens frequently in academic circles (Abduallah & El-zoghby, 2017). From here, we find that many academic institutions have provided a pact of scientific integrity that limits theft and scientific plagiarism by adopting free and commercial tools available online to reveal the degree of scientific papers' integrity (Ahmed, 2015; Rodchua, 2017). Table 4 shows usage rates for free online plagiarism tools.

Table 4. Plagiarism checker tools

Tools	Plagiarism Checker	Paper Rate	PlagScan	Small SEO	Plagiarisma	Copy Leaks	Search Engine Report	Other	Not Use	IUR
Arab	15	2	0	0	7	0	0	0	56	24 /30
Non-Arab	13	14	7	11	3	10	7	5	46	70 /60.3
	28	16	7	11	10	10	7	5	102	94
TUR	%14.28	%8.16	%3.57	%5.61	%5.10	%5.10	%3.57	%2.55	%52.04	%47.95

Arab and non- Arab researchers use free online plagiarism tools less than expected. Through the open question that was put in the study questionnaire about the non-use. The answers came that universities provide them with commercial software available free of charge such as iThenticate, and Turnitin which are more efficient than these tools, It com consistent with the results of (saleh & Elsayed, 2013) study, which indicates that 17% of Arab academic libraries provide scientific plagiarism detection services while 81% of foreign academic libraries offer the same services. On the other hand, these tools are free they only allow for examining a certain number of words and papers.

Plagiarism Checker and Paper Rater tools are the top free plagiarism tools for the following reasons: Plagiarism Checker contains a database containing more than 60 billion

(A) means total Arab usage for all tool, (N2) means all total Non- Arab usage, and (T) means Total researchers' participants (196)(Arab = 80) **and** (Non- Arab = 116)³.

7.2.1 Reference Management and Citation

Reference management tools are one of the important elements that researchers need to organize and manage information sources, document them in their scientific research and publish them (El-mohamade, 2019; Farag, 2019). The percentage of academics using online reference management and citation tools is 100% by non- Arab researchers, while the percentage drops to 80% in Arab use as shown in **Table 3**.

Table 3. References management and citation tools

Tools	Mendeley	Bib ME	Citation Machine	Cite Me	Google Scholar	Zetro	Easy Bib	Other	Not Use	IUR
Arab	15	0	8	2	27	11	0	1	16	64 %80
Non-Arab	31	3	10	6	39	21	4	2	0	116 %100
TUR	46 23.46%	3 1.53 %	18 %9.18	8 %4.08	66 %33.67	32 %16.32	4 2.04 %	3 %1.53	16 %8.16	180 %91.83

On the other hand, some Arab participants (16) indicated that they did not use any of the previous tools because these tools do not support Arabic reference citations and they use the citation feature built-in MS Word. Google Scholar has achieved the highest usage rate by Arab and non- Arab researchers because it provided a quick search in a bibliographic database of millions of scientific sources with many famous references citation styles. The second is Mendeley; a free reference software and academic social network that helps researchers organize their documents. It is also the most scientific database that offer the ability to link with it; to store references accompanied by the full text. The last tool is Zetro. One of the most important feature of this tool is the integration with web browsers in the Ad form as well as the integration with well-known word processor Microsoft and other

³These researchers are aware of these tools, and they are indicated in Table (1) with the name total use.

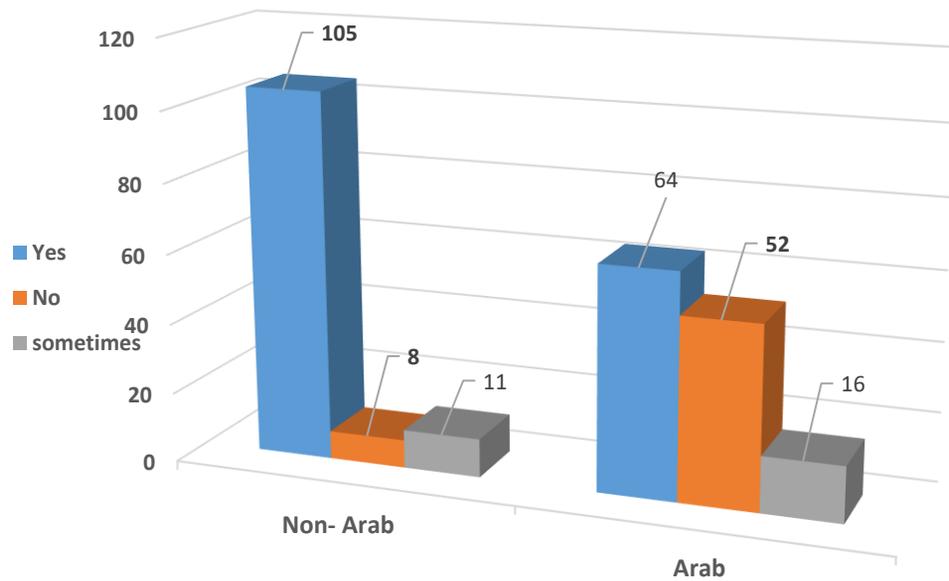


Fig. 3. Arab and Non-Arab researchers' awareness

7.2 Free online scholarly tools usage rates

The author surveyed participating researchers to analyze usage rates of free online scholarly tools in scientific research by asking the following question:

What are the free online scholarly tools you adopt in your research activity? Through listing the most famous of these tools, as shown in the following **Tables 1–12** by following the mathematical equation:

$$\text{Individual Usage Rate (IUR)}^1 = \frac{(N1 - T) \times 100}{T}$$

Where (**N1**) means the total number of researchers who do not use the tools, and (**T**) Means the number of total researchers (Arab = 80) or (Non-Arab = 116).

$$\text{Total Usage Rate (TUR)}^2 = \frac{(A + N2) \times 100}{T}$$

¹The usage rate for both Arab and non-Arab researchers separately.

²The usage rate by Arab and non-Arab researchers together.

9	Web Surveys	Templates ready to create Research questionnaires and polls, which are used in so-called Internet research.	5
10	Statistics Data Sources	Providing researchers with the necessary data and statistics in their scientific researches, which are difficult to collect it by traditional methods.	3
11	Online Translation	Translation texts, and files to multiple languages.	4
12	Data Visualization	Create charts and graphs to represent information using ready-made templates.	5

7.1 Free online scholarly tools awareness

To measure the extent of researchers' awareness of free online scholarly tools, this was carried out by asking a multiple-choice question to the researchers participating in the study: Do you use free online scholarly tools in your research?

The multiple choices were made in three answers follows: yes (**Y**), sometimes (**S**), total Arab/ non- Arab participants (**T**), as indicated in **Figure 3**. The following mathematical equation was used to measure awareness rate.

$$\text{Awareness Rate} = \frac{\text{Total Usage } (Y + S) \times 100}{T}$$

$$\text{Arab Awareness Rate} = \frac{\text{Total Usage } (64 + 16) \times 100}{132} = 60.6\%$$

$$\text{Non - Arab Awareness Rate} = \frac{\text{Total Usage } (105 + 11) \times 100}{124} = 93.5\%$$

There is a marked variation in the awareness rates of Arab and non- Arab researchers in the libraries and the information field about these tools, as non- Arab researchers are more aware of them, while there is a great lack of awareness on the part of Arab researchers because of ignorance of the benefits of these tools in scientific research, and the absence of awareness resulting from the failure to adequately advertise these tools through conferences, scientific lectures, and even literature published in the library and the information science field.

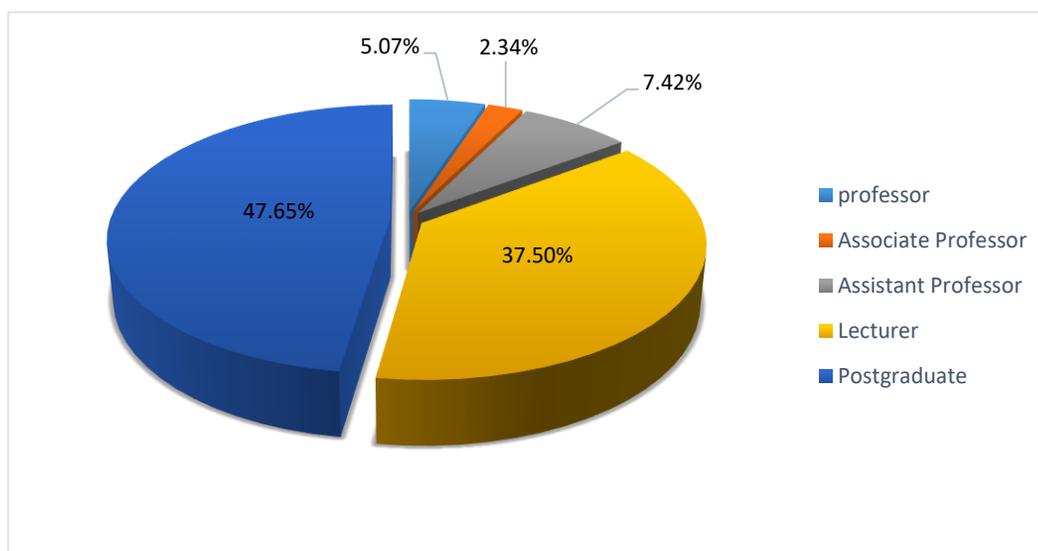


Fig. 2. Participant's Academic Positions.

7. Findings and discussion

The results of the exploratory study on free online scholarly tools were analyzed according to four main axes as follows: awareness, usage rates, advantages, disadvantages, and finally methods of discovery. The free online scholarly tools are classified according to twelve functional sections it contains (66) free scholarly tools used to prepare scientific research on the Internet, as shown in Table 2.

Table 2. Free online scholarly tools classification

N	Main Functional Category	Functions	Tools
1	References Management Citation	Create reference citations in their various formats and link them to their original sources stored in the database, with the ability to search and retrieve.	7
2	Plagiarism Checker	Detecting scientific plagiarism and the quotation rate for scientific papers and aims to achieve scientific integrity in research.	7
3	Social Platforms	Communicate researchers with each other for educational and research purposes and Create common interest groups.	7
4	Open Access to Information	Access and download Full-text scientific papers and other electronic resources.	7
5	Web Search Engines	Searching and retrieving academic information and documents such as text, articles, books, and images.	5
6	Grammar and Writing Checker	Correct grammar, spelling, and errors of writing, to improve the quality of the content.	4
7	Select Journal	Discover appropriate scientific journals automatically by Using some content description fields.	7
8	Cloud Storage Data and Files	Safe storage for data and files on the Internet, to preserve it from the risk of damage and easy access anytime, anywhere.	5

its completion and conduct easily and opened new horizons for research and scientific communication among researchers.

6. Methodology

This study adopted a quantitative method research to collect data. To explore free online scholarly tools, the study adopted an electronic questionnaire from Google to conduct the exploratory study and used several social networks to explore the opinion of participants in the questionnaire including LinkedIn, Facebook, Twitter, and WhatsApp.

The main objective behind the use of social networks in the survey was to make sure that the questionnaire reached the largest group of participants and transcends geographical boundaries. The number of participants in the exploratory study shown in **Table 1** was 256 faculty members and postgraduate students in Arab countries from Egypt, Saudi Arabia, the United Arab Emirates, Sudan, Kuwait, Bahrain, Qatar, Tunisia and Algeria, and from foreign countries; the USA, the UK, Canada, France, Germany, India, Pakistan, and Ghana.

Table 1. The Sample distribution by usage rate for free online scholarly tools

Total Sample (N+A) = 256 Researchers						
Usage Sample	Usage Rate					
	No (N)	Yes (Y)	Sometimes (S)	Total Use = (Y+S)		Total Simple
Non- Arab	8	N = 105	11	116	T	N = 124
Arab	52	60	16	80	196	A = 132
						Total (N+A) 256

The electronic questionnaire was sent to 360 participants, through the social networks previously referred to. The responses received were 311, and 55 responses were excluded as incomplete. The total number of participations was 256 (Arab = 132/ non- Arab 124), 60 of them were not using free online scholarly tools, and 196 (Arab = 80/ non- Arab 116) were using these tools.

Thus, the free online scholarly tools usage rate is measured by 196 participants who answered (**yes**) I used these tools. On the other hand, the awareness rate is calculated by 256 participants who answered (**yes**) and (**No**) about using these tools, as shown in **Fig.3**.

The overall sample was distributed by academic positions as follows: 13 (5.07%) staff member Professors, 6 (2.34%) Associate Professors, 19 (7.42%) Assistant Professors, 96 (37.5%) Lecturers and 122 (47.65%) postgraduate students as indicated in **Figure 2**.

current study came based on the recommendations of previous studies in the literature of the subject.

Finally, what the current study adds to previous studies is that it collected most of the free online scholarly tools that can be adopted in preparing and publishing scientific research in (66) free tools, and has a functional classification that corresponds to the stages of preparing scientific research, in addition to measuring the usage rates among academic researchers showing their advantages and disadvantages and ways to discover them.

5. Scientific Research in Web2.0 Era

It was necessary to point out the vital role of Web 2.0 in the field of scientific research by reviewing the views of others on this point. Web 2.0 has provided smart tools to enhance scientific research such as forums, newsletters via RSS technology, e-mail, open-source digital repositories; and web consortium. All of these tools have helped to create, documentation, publishing, archive; and evaluate scientific research (**Finholt, 2003**). Now, the Web 2.0 has become the main scientific communication platform between researchers to enhance the process of cooperation among them, sharing ideas and experiences and producing research.

Recently, a focus has begun on the production of practical research tools aiming to creating and disseminating knowledge is called a collaborative model for scientific research(Bukvova, 2010; Lyon, 2009), which made the information used as a product, and provided the researchers with the modern technologies skills to keep pace with the developments of the digital age (Calvi & Cassella, 2013; Costa et al., 2016), also web 2.0. It became as a platform for managing and publishing digital content, and provide open access to information resources (Bennett, Bishop, Dalgarno, Waycott, & Kennedy, 2012; O'Reilly, 2010; Ponte & Simon, 2011),In general, Web 2.0 provided a lot of advantages for higher education institutions such as collaboration, participation, and Merging between formal and informal methods of education (Ovelar & Vizcaya, 2010), Furthermore, learning and searching process it becomes available from anywhere and anytime without restrictions, Thus, researchers are sufficiently aware of everything published in their field (Armstrong & Franklin, 2008). Finally, we can say that Web 2.0 has helped to increase the productivity of scientific research and the speed of

in scientific research, The study recommended the necessity of encouraging and training in the use of these tools in scientific communication between researchers and removing concerns regarding their use, particularly security and the reliability of the information. Also, in a similar trend was found in the Procter et al. (2010) study which examined Web 2.0 tools as platforms for scientific communication between researchers to publish their scientific ideas to other societies. The results indicated that 39% of researchers do not use these tools because they are unable to place their trust in them as they are not subject to traditional review. The foregoing results are confirmed by Costa et al. (2016) study which indicated that 42% of the sample do not use these tools in the educational context. Therefore, the study recommended the necessity of conducting exploratory research to determine the extent of the use of these tools in education and research.

4.1 Comment on previous studies

After reviewing some of the published literature about online scholarly tools, it was found that at the time the current study was prepared, there is no Arabian study that addressed these tools comprehensively in the field of libraries and information, and foreign studies largely focused on social media platforms as tools for informal scientific communication among researchers, without indicating their impact on the preparation and production of scientific research.

Looking at the totality of the previous studies, we find that they are case studies for some tools that are used in preparing scientific research, whether free or commercial e.g., (Farag, 2019; Greene et al., 2011; Levin & Levin, 2019; Xu et al., 2018), while some studies dealt with these tools as platforms for scientific communication between researchers e.g., (Al-Aufi & Fulton, 2014; Calvi & Cassella, 2013; Costa et al., 2016; Meyer & Schroeder, 2009; Miranda et al., 2013; Procter et al., 2010; Shehata, 2019), and some tried to combine tools to prepare research and tools for scientific communication via the Internet e.g., (Jeyapragash, 2015; Martínez-López et al., 2019).

Most of the results of these studies indicated the need to prepare in-depth studies and exploratory research on the extent to which these tools are used in scientific research by academic researchers, and to determine their reliability and functional quality, hence, the

the use of scientific tools on the web to facilitate access to and management of information and recommended that these tools are explored by scholars.

Among the studies that dealt with scientific research tools in the form of case studies, we find a study Farag (2019) for academic references management systems in several library and information departments in Egyptian universities, and the most important results of this study demonstrate that these tools would facilitate the preparation and publication of scientific research and increase productivity. Finally, the study recommended the need to apply scientific reference management systems in educational curricula and research. We also find studies that dealt with social media platforms as research tools and at the same time tools for scientific communication between researchers. such as Shehata (2019) study of the scientific communication styles between Arab researchers in the field of humanities and social sciences, the results of which indicated that these researchers use academic social networking as tools to publish and share the results of their scientific research, and the most used of these tools by participants were Wikipedia, ResearchGate, Facebook, Academia, and LinkedIn, and recommended the necessity of adopting these tools as they have a strong impact on increasing the rates of scientific publishing. Also, This has been noted by Elsayed(2016) study which aims to investigate Arab researchers' attitudes towards the use of academic and social networks with a focus on the scientific platform Research Gate and analysis of the responses of the study participants who are numbering 315 researchers. It was found that researchers use these networks to share their scientific publications. The study recommended that the necessity to invent policy for using academic social networks and encouraging researchers to subscribe and use them.

Another similar study by Jeyapragash (2015) reviewed two main tools in the management and organization of scientific research: academic communication platforms and the managing scientific reference. The study recommended that students and researchers should be informed of the importance of these tools in scientific research, and make them available within academic libraries as an information source that achieves cooperation in preparing scientific research. Al-Aufi and Fulton (2014) prepared a study, conducted on social networking tools, on achieving informal scientific communication between researchers at Sultan Qaboos University The results showed that researchers use these tools for scientific communication at a rate of (71.1%) and confirmed that they are of importance

- **Q3:** What are the advantages and disadvantages of these tools from the viewpoint of the researchers participating in the study?
- **Q4:** How had the researchers discovered these tools?

4. Literature Review

The current study was based on science direct, Emerald, Sage, Taylor, and Ebesco full-text databases in addition to Google scholar and WorldCat bibliographic database to find out the most important studies related to the subject of the current study, and the retrieved studies filtered based on two main factors: relevance and modernity.

There have been numerous studies to investigate scholarly tools, most recently, the Martínez-López et al. (2019) study, which reviewed the scientific tools available to help the authors when peer-reviewing scientific research papers. The result of this study was that the tools available for the peer-reviewing process are not being used by academics because they are not known.

In the same vein, Xu et al. (2018) prepared a study on scholars at the University of North Carolina and Oklahoma using scientific tools available on the Internet, namely, Google Scholar, Twitter, the two universities' libraries, and the PubMed search engine. The findings of this study indicated that there is no wide adoption of online scholarly tools by these researchers. While Calvi and Cassella (2013) study concluded that the use of Web 2.0 tools is important in preparing scientific research, both at the personal and institutional levels, this study covered three scholarly tools: social networking platforms, reference management software, and collaborative project platforms. The authors finally recommended that further and deeper studies are necessary to explore Web 2.0 tools and their impact on the educational process. The data from Miranda et al. (2013) study came to support Calvi's study that discusses the benefits for both students and researchers in using Web 2.0 tools in higher education. The results of this study indicated that wikis are the tools most used by researchers to search for information and recommended that awareness of these tools and how to use them should be more widespread. Others (Meyer & Schroeder, 2009) have highlighted the relevance of the importance of Internet research by using some online tools, such as Google's scientific products, and open-access information resources websites. The study indicated that the process of transforming research via the Internet necessitates

activities.(**Johnson, Watkinson, & Mabe, 2018**), and have become necessary for the academic community,for both research and teaching (**Calvi & Cassella, 2013**).

Despite the advantages provided by the free online scholarly tools to researchers, such as saving time, effort, and cost of scientific research, there is a lack of awareness with these tools by the researchers in the field of libraries and information, this point is considered the main objective of the current study. According to the results of the survey made by (**Rodchua, 2017**) the awareness of the benefits of online scholarly tools in research activity is still not enough, and it still needs in-depth studies to determine its importance for scientific research. The main challenge now for researchers is learning to use scholarly tools not only to develop new services in the digital environment, but also to enhance the research process(**McMahon et al., 2012**); so it was necessary to review these tools, usage rates, advantages and disadvantages, and the ways of discovering.

2. Problem Statement

The process of preparing scientific research takes time and effort as well as having an embedded cost, which has become an obstacle sometimes to researchers, but with the emergence of free online scholarly tools, we were able to overcome previous obstacles and the preparation of scientific research became easy. Despite the benefits provided by these tools for researchers, there is insufficient awareness of researchers in the field of library and information science about these tools and their benefits in speeding up the process of scientific publishing, as mentioned by (**Al-Aufi & Fulton, 2014; Calvi & Cassella, 2013; Costa, Alvelos, & Teixeira, 2016; Martínez-López, Barrón-González, & Martínez López, 2019; Meyer & Schroeder, 2009; Miranda, Isaias, Costa, & Pifano, 2013; Xu, Brown, & Hemminger, 2018**)in their studies results and recommendations.

3. Research questions

The findings of the current study were reached by asking several questions that the study tried to answer through the questionnaire used in the survey process, including:

- **Q1:** How extensive was the researcher's awareness of free online scholarly tools?
- **Q2:** What are the usage rates for free online scholarly tools by Arab and Non-Arab researchers?

1. Introduction

The internet has led researchers to move from the traditional scientific research environment to what is known as Internet-based research or online research community and became an important source in academic institutions and college life to collecting data and information, preparing scientific research, and communication between researchers, and this process is constantly increasing (Gagan & Rakesh, 2013; Meyer & Schroeder, 2009). Also it provides two main functions in the scholarly process: the first is communication, and the second is to obtain information for scientific purposes (Warren, 1998).

There are three practices for using the internet in scientific research shown in **Figure 1**, by using free online scholarly tools, which may help to overcome the obstacles to preparing scientific research, such as time, effort and cost, which negatively affect the academic publishing process and then the classification of universities.



Fig. 1. Internet Scientific Practices.

The first practice is data collection, where the researchers are able to collect their scientific data easily and quickly, and the design of samples became unrestricted in a specific geographical area (Greene, Baldwin, Dolor, Thompson, & Neale, 2011). The second free access to research data and publications, the Internet broke the barrier of monopolizing knowledge and information, now the researcher can own the information resource instead of borrowing it. Furthermore, the researcher became able to access to the information any time and from any location with internet access (Mudry, 2014). The third practice is academic publishing. Recently, software and service designers have developed digital tools to support research practices. These tools have made the Internet a platform for academic

Use of Free Online Scholarly Tools by Arab and Non- Arab Researchers in Library and Information Science Field:

An Exploratory Study

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Abstract

The current study aims to determine the extent of awareness of free online scholarly research tools among Arab compared to non-Arab scholars in the field of library and information science. This study measures rates of usage, perceived advantages and disadvantages, and the methods of discovering these tools which defined as tools that are used to help postgraduate students and academics interested in scholarly to prepare their scientific research easily and freely.

The study adopted the quantitative approach in collecting data through the survey of (256) participants, including (132) Arab researchers and (124) non- Arab researchers. The results of the study indicated that there are (66) free scholarly tools used to prepare scientific research on the Internet.

Despite the advantages offered by free online scholarly tools such as saving time and effort (24.48%). The awareness of these tools is still insufficient on the part of Arab researchers in libraries and information field (60.6%) in exchange for raising awareness on the part of non-Arab researchers (93.5%). So, it is necessary to the advertising of these tools adequately and teach it for Arab researchers in all fields. Further in-depth research in the future recommended to determine the functional quality and the possibility of their adoption in library and information science research.

Finally, this study is not only important for researchers, but also for software developers and producers of these tools, Where they can benefit from the results of this study to find out the researchers' insights and their needs from these tools and work to meet them in the future.

Keywords: Scientific research, Scholarly tools, library and information science, Web 2.0, Learning tools, Internet-based research.