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Are the UAE Academic Libraries Ready to Support Research 2.0?

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Abstract

Purpose –The purpose of the paper is to recognize different errands and responsibilities that the UAE academic libraries must undertake towards the trendy changes in researchers' information seeking behavior, and fulfill to the advancements carried in by the emergence of Research 2.0.

Design/methodology/approach– The researchers comprehensively reviewed the appropriate literature related to the academic libraries' activities viz., information literacy (IL) education, research data services (RDS), awareness-raising, and support individual faculty members in the United Arab Emirates.

Findings – The UAE librarians organize information literacy education for the students of all programs, primarily to research scholars and faculty in both Arabic and English languages. The faculty members are supported with discipline-specific databases, print and digital versions of books and journals along with other online services. Regarding raising awareness, library professionals in the country actively involved in the transformation of all types of knowledge sources and their updates to all stakeholders of the education, whereas research data service is slowly gearing up in many academic libraries.

Originality/value – The paper proposes to be an addition to the body of knowledge about academic library support through information literacy, awareness raising, faculty attention and research data services to researchers in the UAE.

Keywords – Academic libraries, Research 2.0, Informational literacy, Research data service, Data literacy, UAE

Paper type: Viewpoint

1. Introduction

Not just like the previous educational system, most of the higher educational institutions are places where a faculty lecture notes go straight to the students' records, without passing through the brains of either. The casual type of process of learning is the most common practice and paradox spread in most developing and underdeveloped world. Every stakeholder of the education sector has recognized the fact and practices spread in most parts of the world, which have given an alarming situation or warning particularly to the control mechanisms of the respective countries who are responsible for set right the things in the education system. The reasons are plenty, and no one can blame anyone for the kind of situation because everyone knows the ideas. However, no one can come forward to rescue the system with a variable number of impediments, and the sluggishness spread in the minds of the think-tank of the apex controlling authorities. In modern days, teaching fraternities' most common responsibilities are teaching, research, and academic service. Most of the faculty members in these days forcefully taken-up the most crucial trust, i.e., the analysis only because of pressures and threats identified from the higher officials of the respective departments as well as accreditation authorities from the Ministries of Education of respective countries along with the local, regional, and international accreditation bodies. Otherwise, the majority of the faculty members in most parts of the world are reluctant to continue their research because of work pressure, sluggishness, family burdens, personal problems and poor work-life coordination, and so on. Even in this kind of situation, with intense zeal and zest, some faculty members, along with the limited number of students, are extensively involved in the research who needs extensive cooperation and support from the knowledge centers of the higher educational institutions from every part of the globe. There is no exception, even to the United Arab Emirates. The Middle Eastern crucial superpower and the amalgamation of seven emirates, the UAE's academic libraries, are playing a prominent role in extending their all types of support to their research community by providing the required resources promptly. Irrespective of the attitudinal displays of the teaching fraternity towards research, the knowledge transformation centers (libraries) of different higher educational institutions in the United Arab Emirates offer all hard and soft copies of resources to the researchers of sciences, social sciences, and humanities. In the viewpoint paper, the faculty and research colleagues have taken an initiation to firmly identify

the roles and responsibilities libraries must fulfill to the advancements carried in by the emergence of Research 2.0.

Brydges and Clarke (2015) stated that the recent library literature clearly showed well-grouped concern about the role of academic and research libraries in supporting academic research. When compared to yesteryears libraries, modern libraries are continuously procuring along with traditional hard copies of books, journals, monographs, and other documents along with soft copies with kindle versions. Being inhabited with this, academic libraries did pay enough attention to the core process of research the dynamics of change within scholarly communities (English, 2004; Genoni et al., 2006; Jahnke et al., 2012). Modern researchers in all disciplines extensively required all types of data from varied sources for which their first search source is their own institution's libraries. If this is not merely a question mark of obtaining viewpoints established on trivial perspectives, but reality, there is a need for change. Without any wavering, changes in researchers' information behavior along with the publishing sphere are calling for a vital transformation of the role and tasks of the academic library. These changes have induced by the appearance of Research 2.0 (Science 2.0 or eScience). As mentioned in the viewpoint paper by Koltay (2016), Research 2.0 understood as research in the sciences, social sciences and the humanities that make use of the power of the Internet that enables different new forms of networking encourages openness and provides the possibility to access and manipulate massive amounts of data.

2. Research 2.0

With the dawn of information technology, the information scenario has improved, similarly to the process of research. Previously researchers applied orthodox practices for their research work. After the invention of Information & Communication Technology (ICT), the entire complicated research process has been changed and reduced to minimum steps. When explaining the role of educational libraries in encouraging Research 2.0, the crux of the paper is generating a portfolio of errands and functions that academic libraries may be required to fulfill now and soon. During the quinquennium, as new developments evolve, just like in every field, including libraries, new content can be added to this portfolio. There are widespread inconsistencies and controversies identified by the researchers with the introduction of Research 2.0, which is the methodical examination to find out the new fact, an innovation by applying web application. Research 2.0 confidently creates discussions concerning researchers, encourages them to discuss just their

inventions, and socialize them with others. Different authors defined the term Research 2.0 from different perspectives. For instance, in a broader sense, Research 2.0 is a term for the use of Web 2.0 tools viz., Google Scholar, Mendeley, Survey Monkey, CiteULike, Google Docs, Zotero, Bib. Me, Bubul.Us, and principles in scientific research used interchangeably with Research 2.0 but scientifically comprised study in fields other than science, such as the humanities. Shneiderman (2008) defined the term Research 2.0 suggests a contrast between traditional ways of doing science, often denoted Research 1.0, with more collaborative approaches, and suggests that the new forms of research will work with Web 2.0 technologies. Waldrop (2008) defined the term Research 2.0 is not to be confused with a similar name that has recently been coined Science 2.0, which is the notion of open science whereby scientists publish their emerging experiment results in public, collaborative forums. On one side, information technology has profoundly modified how researchers communicate (Borgman, 2007), and on the other hand, technological variations did not change over the procedures of trust and authority. Consequently, many researchers convinced that there is a significant difference between experimenting with new tools and using the well-established channels of scholarly communication (Acord and Harley, 2013; Nicholas et al., 2014).

Many of the pragmatic investigations show that researchers experience a higher-education climate that favors peer review and citation indices because there are no generally accepted measures to evaluate social media-based content (Nicholas et al., 2015). However, many researchers identified that there were no significant career benefits over the usage of social media. Although, in recent years, a significant change has been taking place in the thinking of world researchers either in any discipline towards social media-based support and cooperation with their research. The kind of evident approachable change has led to the shift in academic libraries in providing the social media-based sources to their in-house researchers. Based on the latest requirements of the research community, innovative services are beginning to show their mark on modern research in the fields of sciences, social sciences, and humanities. These innovations not yet continually or methodically developed and available to the academic researchers for which the researchers are eagerly waiting to get those. There is a little indication that the prolonged practice of social media services will lead in the short or medium-term to substantial and innovative changes in scholarly communications. In stock, although Research 2.0 is with us, there are several impediments in the way of its broader application (Collins, 2013; Koltay et al., 2015).

2.1 Research 2.0 in different parts of the globe

The data-rigorous element of Research 2.0 reveals a unique picture in a sense that-as yet-its development has been highly dependent on research funders' requirements. Due to the extensive activity and cooperation of the research funders, the UK is on the lead in Europe, and the researchers can see massive development in countries like Austria, Germany, Ireland, Norway, and the Netherlands. The European Commission has taken initiation and participate in the process of providing mammoth funding support along with encouraging all their member countries towards the introduction of Research 2.0. Outside the EU, other developed countries like Australia, Canada, and the USA, open access (OP) to research data is required by several research funders (RECODE, 2015). With the help of extensive funding, academic libraries in the said developed world successfully providing the research data necessary through open access, which is substantially helping the entire research community in all disciplines. The kind of extensive funding is an enormous motivating factor to all types of academic libraries, which is expecting similar kind of support from the governments and other funding agencies even in the developing countries. Except very few, most of the developing countries in every part of the globe are lagging in providing the kind of academic support community is required due to funds crunch, and some countries are offering an insufficient quantity of funds for the purpose. However, in less research-intensive universities, it is typically challenging to get managers to recognize that data-intensive research requires specialist staff and skill development (Gwyer, 2015). A similar kind of problem is pervasive in most of the universities in different countries, particularly developing and the underdeveloped world in which funding bodies won't have any motivation towards Research 2.0. Even these countries and higher education institutions should be conscious of the potential of the significance and potential effect of associated advancements.

2.2 The United Arab Emirates and Research 2.0

Following the above discussion, this paper addresses the following activities (Koltay, 2016) in different countries and the present situation in the UAE:

- Information literacy (IL) education
- Research data services (RDSs) (with attention to data quality and data citation)

- Raising awareness on different issues, and
- Supporting individual faculty members

2.2.1 Information Literacy education

Most of the academic libraries in several countries, irrespective of the economic status, are providing information literacy education to both undergraduate and graduate students as their crucial and traditional activity. The existing academic libraries, through their general service, are entirely failed to satisfy the updated data to all faculty members, non-teaching researchers, postdoctoral researchers, and doctoral students of sciences, social sciences, and humanities. A relatively full circle of the said target researchers is addressed by the Information Literacy Competency Standards for Higher Education, conceived in the USA by the Association of College and Research Libraries (ACRL, 2000), and also in its newly developed version, the Framework for Information Literacy for Higher Education (ACRL, 2015). Distinguished attention must be given to the SCONUL Seven Pillars of Information Literacy. Core Model for Higher Education was devised by the Society of College, National, and University Libraries in the UK (SCONUL, 2011).

Information Literacy is the set of skills crucial to obtain, repossess, evaluate, and utilize information. Today with the quantity of information accessible, it is vital for students, notably teacher education students, to improve these competencies. Information literacy is imperative for today's all classes of learners particularly researchers, and it encourages problem-solving methods and intellectual skills – a) questioning on different issues in quest of answers, b) finding information, c) creating ideas, assessing sources and making decisions nurturing efficacious learners, d) productive contributors, assured individuals and accountable citizens. Information literacy is at the crux of the curriculum for excellence and literacy across the knowledge acquisition process and results, which is a responsibility of all practitioners. Uniquely, the research community needs to be able to identify what is real and relevant not just for institutions but for learning, life, and work. In simple terms, information literacy is the aptitude to be able to identify when information is required and could detect, appraise, and primarily utilize the needed information. To be competent to deal with a text, either hardcopy or employing technology, you need to have problem-solving and critical thinking skills. The Vitae Researcher Development Framework is exclusively for doctoral students, research personnel, academicians, or thoughtful about applying

the skills developed during your research. The Researcher Development Framework (RDF) describes the knowledge, behavior, and attributes of successful researchers. It is a significant new approach to researcher advancement to increase our capacity to construct the UK personnel, develop world-class researchers, and build our research base. The RDF is a specialized development structure for planning, promoting, and supporting the personal, professional, and career development of researchers in higher education. It articulates the knowledge, behaviors, and attributes of successful researchers and encourages them to realize their potential (RDF, 2011). With the perspectives of researchers, information literacy defined as the knowledge, behaviors, and attributes of a productive and highly skilled researcher. An imperative brand-new advancement is intensifying attention towards data literacy. Data literacy is an emerging one, which has close ties to IL by being situated at the intersection between scholarly communication and IL (ACRL, 2013). Data literacy can be defined as a specialized skill set and knowledge base, which enables individuals to transform data into information and actionable knowledge by allowing them to access, interpret, critically assess, manage, and ethically use data (Koltay, 2015). Data literacy education should incorporate both the social and technical aspects of data (Sharma and Qin, 2014). This is demonstrated by the list of abilities that define data literacy, conceived by Calzada Prado and Marzal (2013), as follows:

- Knowing how to select and synthesize data and combine them with other information sources and prior knowledge
- Identifying the context in which data are produced and reused
- Recognizing source data value, types, and formats
- Determining when data are needed
- Accessing data sources appropriate to the information needed
- Critically assessing data and their sources
- Identifying and using suitable research methods
- Handling and analyzing data
- Presenting quantitative information
- Applying results to learning, decision-making or problem-solving and
- Planning, organizing and assessing ourselves throughout the process

The UAE Situation: The information literacy is a core instructional pedagogy in higher educational institutions in the UAE in which library leadership persistently provide research instructions to students. For students, the transformation of information literacy through instructional pedagogy mostly in the areas of open identification sources of information in their field of interest, synthesize useful and novel data, and evaluation of its applicability and exceptionality to use in the educational and research areas of the curriculum. The information about scholarly journals, its reputation, indexing, impact factors, guidelines, and reference styles along with the availability of book sources (print and digital), availability of discipline-oriented latest databases and its updates, e-dissertations, e-theses, conference proceedings for the postgraduates and research scholars has been regularly offering by the library community of the United Arab Emirates. Distinctively, based on the requirements of faculty of different disciplines, librarians in the country are supporting with the latest and updated information about databases, journals, books (both text and references), conference alerts, reference styles, author guidelines, publishing opportunities through intra-institutional seminars, discussions, brown-bag sessions. The Information Literacy program is designed within the specific cultural context of the United Arab Emirates (UAE) to meet the needs of Arabic speaking students. The IL Program respects the diversity of learners and learning styles, incorporates the latest trends in available technology and pedagogical approaches, and follows the ACRL Characteristics of Best Practices in Information Literacy. In the new paradigm, the ultimate goal is not just to provide or make available knowledge on any queries, but to create knowledge channels which allow synergy of knowledge initiatives and learning gestures. Information Literacy Network of the Gulf Region (ILN), which is a voluntary group of Librarians, provides professional development activities in the Gulf and has organized three conferences and numerous workshops since its founding in 2005. However, data literacy education is still in its infancy in universities and the academic field. Yet, vocational courses introduce data management and data analysis training to improve the skills in interpreting various data into useful knowledge. Students being potential researchers are the primary data literacy educations' target audience. Yet, librarians should also acquire the knowledge and skills of data literacy to provide support in data-related research processes. Data quality plays a vital role in data literacy as it includes assessing sources of data for trustworthiness and problems, evaluating and analyzing, and interpreting data and representing conclusions correctly (Zilinski and Nelson, 2014).

2.2.2 Research data services

Research data services is a system of services all through the library to assist everyone during all phases of the research data lifecycle. The academia and the research community should always be in touch with the librarians to get services in the areas of data management planning,

discovery and access, data organization and management, metadata and documentation, data sharing and publication, preservation, and data visualization. Research data are managed on different levels by varied players of the related processes. These processes include research data management (RDM) and data curation. RDM is a set of general activities not individually attached but potentially performed by the library in which caring for research data, facilitating access to it, preserving and adding value to these data throughout its lifecycle that is one of the critical determinants of open data publication and data curation, bring the benefits of enabling finding and understanding data, avoiding unnecessary duplication and validating results (University of Edinburgh, 2015). RDM is a crucial element in the publication of research data sets, especially if we endeavor the openness of data. It is also a principal constituent of data curation services (Si et al., 2013). Every librarian should have a clear and concise picture and familiar with the research data needs of researchers of different disciplines and have been among the supporters of innovative publishing models, including open access publishing. They are already involved in acquiring the necessary abilities to manage data (Hswe and Holt, 2012). This involvement is demonstrated by the fact that the growing importance of RDM has been identified as an imperative by the ACRL Research Planning and Review Committee (ACRL, 2014) and Horizon Report of the New Media Consortium (NMC, 2014). The high request for professionals who can assist scholars in their research activities is also an indication of this (Marcum, 2015). Research data services (RDSs) is a comprehensive assistance framework that is associated with these processes and should be offered by academic libraries. The Association of Research Libraries (ARL) declared that academic libraries are in a favorable position to help researchers to meet the challenges of a data-intensive research paradigm by providing RDS, and a few academic libraries already offer RDSs. The number of libraries that plan to engage in such activities is growing. As a rule, these services are extensions of traditional services (Tenopir et al., 2014). All the libraries and librarians should understand the significance of research data services through which they have to acquire and provide the RDS services to all the academicians and research community under their purview. Both academicians and researchers from all the disciplines are expecting persistent cooperation from their libraries to get the required research data, along with best practices in data management, data citation, intellectual property and copyright, privacy, and confidentiality. Librarians can promote tools to track the impact of data sharing and helping to connect data sets to other scholarly output through linked data and citation tools (Flores et al., 2015).

The UAE Situation: Although library services extend to permitting researchers to login to library portal online and offline, linking to the library's disciplinary data repositories, conducting literature review through various databases and other web-based resources. The UAE librarian's community is playing a vital role in changing research behavior by supporting the researchers in building the knowledge and skills required to retrieve and manage data by conducting hands-on workshops, seminars, and data skill development programs. Reference Management software or Citation Management software viz. Mendeley, Zotero, Refworks, Endnote, are commonly used to generate references, citations and bibliographies in a range of referencing sstyles. There is a firm intention to develop a more coordinated plan of research data skills development for young researchers by embedding the data management skills development into Information Literacy education. 'Data librarians' at New York University in Abu Dhabi liaise with researchers and research groups to foster an interoperable infrastructure for data access, data processing and data sharing along with the development of data standards, and to provide metadata services and data workshops. The librarians in the country also extensively involved in maintaining and make available research data software like SPSS, SAS, R-Studio, MATLab, and Photoshop.

2.2.3 Raising Awareness

Beyond the traditional set of services offered by the academic libraries in the world, librarians provide a new set of services to the researchers' community, mostly about different tools of Research 2.0. Any academic library does not directly offer these tasks in any part of the globe, but successfully they are providing with their own set of personal interests. Even though they won't have enough knowledge of the requirement of academic researchers, particularly beyond their educational background, most of the librarians attempt to find, acquire, and provide the same to the required. Most of the librarians are creating awareness about the use of social media tools and sites designed exclusively for professionals and researchers. The academic librarians must raise awareness of social media sites intended for professionals in general (like LinkedIn [1]), and those meant for researchers (e.g., ResearchGate [2] and Academia.edu [3]). The world of academic libraries also clearly passing the communication about the open access and the Diamond, the Gold, and the Green routes of public access along with most crucial issues, i.e., Article Processing Charges (APCs) to the academia and the research community. Along with the above, many librarians also present information about the presence of predatory publishers and journals, which

are enumerated in the List of Predatory Publishers [4]. Significantly, due to the vagueness of the notion of predatory publishing, besides blacklisting, whitelisting reliable publishers and journals may be a viable solution, as the example of the Directory of Open Access Journals (DOAJ[5]) shows it (Berger and Cirasella, 2015). Even the open-access data entail connecting the conditions of being accessible, useable, affordable, and intelligible. At the same time, there must be an understanding of the lawful frontiers of openness set by marketable concern, the protection of privacy, safety, and security. The barriers to transparency must be scrutinized to limit the prohibition to cases when research could be misused to threaten security, public safety, or health (Royal Society, 2012). If big data is taken from social media, privacy, and anonymity of research subjects cannot be guaranteed, and such data are not reliable and representative. In such cases, besides researchers, librarians also must be made aware of problems and provide them with opportunities to correct or remove data about themselves (Sula, 2016). Libraries provide a concise description for faculty and researchers on the website on managing, storing, and sharing data. The most recent awareness creating area by the academic librarians is the Dutch Data Prize, which honors the endeavors of researchers who bring data together, document it, and make it accessible to others (Research Data Netherlands, 2015). The Data Seal of Approval (also a Dutch Institution) that gives data producers and funders the reassurance that their data will be stored probably and can reuse is similarly impressive. [6] Data journals may overcome several barriers to open data, as they promote the publication of data papers in a way that reflects the scientific publication model (Candela et al., 2015). Another significant issue considered by the librarians' community to communicate about the availability and accessibility of substantial quantities of textual material, in particular, full texts of journal papers and books under the title of alternative metrics (often called *altmetrics*) of scientific output are an essential feature of Research 2.0.

The UAE Situation: The consortium of academic and research libraries in the UAE has been created to enhance the education and research resources available to stimulate the country’s knowledge economy by establishing a shared union catalog, engaging in cooperative collection development, and developing a national digital institutional repository, eFADA [7]. The repositories are the primary tools for preserving organizations’ legacy, and they facilitate digital preservation and scholarly communication. BSpace and DSpace are digital repositories in British University in Dubai (BUiD) and American University of Sharjah (AUS), respectively, that provides access to dissertations, theses, research projects, faculty publications, and archives. The

University of Dubai (UD) and Sorbonne University of Abu Dhabi are using Corepaedia, which is a repository that collates research work, supports local and regional research with data consistency, linking entities, research profiling, and research output and is indexed in Directory of Open Access Repositories (DOAR). Masdar Institute and Khalifa University, Abu Dhabi, joined a consortium of libraries under UAE's ankabut [7] to share resources. Libraries promote the use of institutional repositories and the Library and Information Web Access (LIWA) for library lending and document delivery among member institutions of UAE. The need for developing new relationships and enhancing existing partnerships across campus is persistent among educational institutions (Clement et al., 2017) and the same also enforced by the Ministry of Higher Education of UAE. Exceptionally, the UAE's library leadership has been involving in a collaborative networking system among private higher educational institutions by signing a Memorandum of Understanding (MOU). Through these cooperative agreements between the libraries, both faculty and students of all disciplines are benefiting extensively for their research, teaching, and other academic purposes. The educational library leadership persistently acts as a liaison between the publishers and academia and raising awareness among both by communicating curriculum updates and the introduction of new book titles and editions released. From the academic library leaders, the flow of two way communication not only limited with the above and regularly going on in sharing information about supplementary material which consists of instructor manuals, cases smart book, test question banks, and Microsoft PowerPoint Slide material along with the availability of Kindle and digital versions of text and reference books. The library community in the country is also extending its maximum cooperation in offering abstracting and indexing services to the research and academicians in all the disciplines like sciences, social sciences, and humanities.

2.2.4 Supporting individual faculty members

In most parts of the world, teaching staff members' composition is crucial and comparatively sizable unit of researchers. Yet, many of the academic libraries in different continents mostly introducing support activities directed to all the researchers but not individual teaching or faculty members. So, library management should design and add support activities generally to the research fraternity of the institution and strengthen the existing operations keep in mind the imperative situation to continue the research in sciences, social sciences, and humanities. And uniquely, here faculty members in their fields of research interest should collaborate with the

bright students from their classes even from the undergraduate programs itself along with graduate and research students to inculcate the culture of research. The academic libraries introduce the expected level of support activities to the teaching fraternity for which library management should know two crucial issues viz. a) the perception of librarians about their role concerning the research of faculty, and b) the opinion of faculty about the supporting role of librarians in their study. Broadly, as said by Brydges and Clarke (2015), the following groups of support activities aimed at individual research of different faculty. These categories are: a) providing friendly alerting services, b) purchasing requested resources, c) answering in-depth reference questions, d) creating visual representations of data, e) co-researching about scholarly publishing in a specific area of knowledge, f) co-researching the scholarship of teaching, and g) consulting about searching.

The UAE Situation: During the research process, researchers and librarians discuss the research topics, data-related needs and challenges they encounter. Librarians offer reference support for finding and citing data or creating web guides for data and data repositories, individual consultations, workshops, and assistance with creating data-related activities. Library professionals are also called blended librarians as they have multiple roles, including scholarly communication, and those of the researcher. The UAE academic library leadership persistently has been proffering substantial support in finding an appropriate all kinds of material for literature review, theoretical framework, latest editions of reference styles, and data collection. In helping data collection from the subjects or respondents, librarians, by employing their interactive skills, are collecting the data from the students who are visiting libraries along with continuous updating on various data sources available in the academic world. Most significantly, some librarians who have a vibrant zeal and zest on research persistently inspiring young researchers and students by actively participating in the inter-departmental study in their field of preference and interest. The article has initiated and completed with the kind of unique interest shown by the corresponding author with the collaboration of the college of business faculty and working rigorously in extending max support and cooperation in publishing more peer-reviewed articles. Most of the academic library leadership in the country has competent knowledge on various reference styles and providing the updated versions of widely used reference styles, mostly Harvard, and APA along with helping the research community in identifying the Journal of Economic Literature (JEL) classification codes. With the confident command on language and computer dexterities, many librarians extended their cooperation to the research community particularly in the higher

education sector in proofreading and data visualization services particularly graphs, tables, maps, and charts apart from preparing Microsoft PowerPoint Presentations (PPTs) for conference presentations of the research. The UAE Librarian community has confident knowledge of data visualization services by which they are helping most of the sciences, social sciences researchers in framing all kinds of graphical presentations of information and data. Along with the above, librarians also extending their cooperation in providing frequent alerts on the availability of updated literature, books, journals, databases, along with innovations in all fields of academics in general and field of their expertise. Finally, even with the endless number of the sorry state of affairs, the UAE's academic library leadership confidently in touch with the academia of their institutions along with other higher educational institutions by establishing collaborative agreements in sharing, updating, and using the resources available with them.

3. Conclusion

Although information literacy education already exists, research data services are slowly getting momentum. And academic libraries and librarians are preparing to master in developing data for deposit into repositories and removal from it, as well as creating or transforming metadata for data sets (Tenopir et al., 2015) to support Research 2.0. It is the academic librarians who should be aware of the changes and requirements of researchers, assisting in developing data management plans, creating metadata, employing multiple research methods while working on a single project or group projects, the diversity of methodologies is challenging for librarians. The interpersonal skills and personal characteristics, understanding data types, data-related problematic issues, and appropriate information technologies are essential requirements for librarians to render quick services and build a foundation to handle the data-intensive nature of Research 2.0. The involvement of librarians in supporting and advising researchers is essential now and in future with several critical skills as identified by Aukland (2012) with the preservation of research outputs, data management, and curation, complying with the various mandates of funders, including open access requirements, potential data manipulation tools, data mining, and the use of metadata.

Notes:

1. www.linkedin.com/
2. www.researchgate.net/

3. www.academia.edu/

4. http://scholarlyoa.com

5. http://doaj.org/

6. http://datasealofapproval.org/en/information/about/

7. http://ankabut.ae/efada/efada.overview

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