

The Role of the Digital Library in the Development and Encouragement of Scientific Research During the Corona Pandemic

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Abstract

The study aimed to shed light on the impact of using the digital library in encouraging and developing scientific research from the point of view of graduate students at the College of Business at King Khalid University during the COVID-19 crisis. The descriptive analytical approach was used to achieve the objectives of the study. A questionnaire was used to collect data and information, and the SPSS program was used to analyze the data. The study reached several results, including the fact that the digital library helps detect plagiarism, forgery, copying, and imitation in scientific and technological research and facilitates communication between academic researchers from faculty members and students by logging in. The digital library and the exchange of ideas and information contribute to the development of scientific research. Graduate students use the resources in the digital library to efficiently complete their assignments and scientific research. The use of the digital library contributed to saving time and effort for graduate students. It was recommended that the culture of digital awareness be spread by preparing workshops for graduate students to introduce them to digital libraries and teach them how to use and activate them in the service of scientific research.

Keywords: scientific research, digital library, Cov19.

1. Introduction

Digital libraries are valuable to education because they provide access to and opportunities to use primary online resources. To be effective as educational tools, they must do more than provide access to quality resources. The true power of media and technology to advance education and learning is realized only when students actively use them as knowledge tools rather than perceive and interact with them as users or repositories of information. Digital libraries must, therefore, be more than just repositories; they must support the complete life cycle of data, information, and knowledge(Lagoze, Krafft, Payette& Jesuroga,2005).

Digital libraries must match and greatly expand on traditional libraries. As such, digital libraries must be more than search engine portals; they must be highly selective of resources that meet criteria relevant to their mission and provide services, including search, and facilitate the use of resources by their target community. As digital libraries are freed from the constraints of physical space and media, they become more adaptable and reflective of the communities they serve. They must be collaborative, allowing users to contribute knowledge to the library either actively through comments, reviews, and the like or passively through their patterns of resource use. They must be contextual, reflecting an expanding network of interrelationships and layers of knowledge that extend between the primary resources selected. As such, the core of a digital library should be an evolving knowledge base, weaving together professional choice and the crowd's wisdom (Lagoze, Krafft, Payette& Jesuroga,2005).

Because of technological changes, there has been a clear and explicit public demand for improved science education and a call for increased access to quality science education for all citizens. This call has been answered by the emergence of diverse operational digital libraries dedicated to science education across various scientific, mathematical, engineering, and technological disciplines. To encourage and support continuous improvements in science education at all levels by providing collections of digital educational resources and associated library services. (Sumner., Khoo., Recker, & Marlino, 2003).

The COVID-19 epidemic appeared in China at the end of 2019, leading to heavy losses in lives and economic activities. Countries have taken many measures to contain the spread of the virus, such as complete closures and travel bans, which reduced the movement of individuals and disrupted a large part of the business sector and educational institutions.

Since the outbreak of the COVID-19 pandemic, higher education institutions have been organizing to implement the requirements of non-suspension of learning and continuity of teaching during the COVID-19 period. E-learning environments and online instruction use the interactive network system to enhance the quality of teaching and learning by managing the content provided to learners through various learning activities. During the coronavirus pandemic, several online courses were held in a very short period. This is a rapid response to the pandemic. Still, it has also been a significant challenge for most instructors accustomed to delivering offline course lectures in classrooms and using traditional means of teaching and research. Online instruction has become one of the course delivery options. Nowadays, university students can quickly adapt to this digital learning environment. Despite the rapid spread of online learning at the university level, few people have studied or prepared students for this learning environment. Subsequent studies have explored the utility and reliability of e-learning and digital transformation in education in various contexts, such as teaching and scientific research (Chang & Fang, 2020)

For some time, carrying out activities and processes using digital means was considered the exception. Still, in our time, it has become the norm and represents the nature of the environment for conducting research, reading, and education. Digitization of activities and automation of processes is expanding day by day at high rates to include all areas of life, including educational aspects, where a wide range of educational practices such as teaching, training, and research are implemented digitally. (Zaghdoud, 2020).

The digital library came from the communications revolution and its applications. It contains electronic information that represents all its contents, and therefore, it does not need a building to house it, but rather a group of servers and a network that connects it to users. It is global in its services and is considered one of the libraries of the future (Zaidi, 2010). The COVID-19 virus appeared in China in December 2019 and forced all institutions in their various sectors to oblige their employees to perform all their duties from home to prevent the spread of the virus. It was also reflected in students receiving educational activities and undertaking and completing assignments and research via the Internet. With the emergence of the digital information society, the digital library contributes to helping students and researchers continue the educational process and scientific research during the Corona pandemic.

2. Literature Review

2.1: The digital library

A digital library is a set of services and information objects. Support users in dealing with information objects that are available directly or indirectly. Electronic/digital means It is a managed collection of information, with associated services, where information is provided. (Seadle & Greifeneder, 2007).

The library acquires digital information sources, whether initially produced in digital form or converted to digital form, and does not use traditional printed sources, regardless of whether they are available on the Internet or not. Their bibliographic control processes are carried out using an automated system, and access to them is available via a computer network, whether local or expanded or via the Internet (Ali, 2011).

Digital libraries have a positive impact as they enable sharing of learning resources to support distance education, on-campus learning, and independent learning based on research and discovery. The significant growth in the development of digital libraries is due to the realization of the importance of lifelong learning and self-learning, which has led to the recognition of the importance of the digital library in providing access to digital information resources that meet their needs. Digital libraries enable many people to access a single copy of electronic resources (books, articles) at a lower cost than the relatively high cost of many printed copies. Supporting educational goals is one of the critical goals of the digital library in addition to being an educational platform, an educational resource, and a space for research and authorship. It can also be viewed as another source of information and a powerful resource that enables it to provide an opportunity to engage the student in learning based on research and inquiry. (Owusu-Ansah, Rodrigues, & Van Der Walt, 2019).

Libraries come in many forms. In computing, code libraries were part of the software engineering world. Object libraries are part of object-oriented programming efforts. With multimedia technology, we now have image, audio, and even digital video libraries. Traditional libraries devote an increasing share of their funds to electronic services, whether in CD-ROMs, public online catalogs, or online databases. Electronic services are becoming more valuable, affordable, accessible, and usable. Many other reasons encourage the demand for electronically available

information, such as the desire to obtain news and learning, the pride of authorship as evidenced by local or honorary publication, the willingness to collaborate or at least share with colleagues, the pressures of reorganization and restructuring, the ubiquity of electronic publishing, the excitement of exploring a vast sea of information, and the push to use new technological tools. These are some of the many reasons why humanity is now working towards the great challenge of creating a global digital library system. (Fox, Akscyn, Furuta, & Leggett, 1995).

The digital library also includes the three main editorial functions of the traditional library: cataloging, long-term archiving, and access). Online The digital library provides digital documents electronically in connection with online services, based on the conventional library's tasks, making its collection accessible worldwide. (Seadle& Greifeneder ,2007).

(Sayed,2016) confirmed that it includes many resources available in a machine-readable form; its sources can be accessed through computers, and its digital contents can be accessed locally or through remote communication via computer networks. Automatic indexes, then moving to indexing and extraction services for periodicals, making the periodicals themselves and many reference works available, and finally publishing books and digital libraries are usually referred to in dedicated intellectual production by the abbreviation.

(Owusu, Rodrigues & Van Der Walt,2019)& (Rezaei, 2006) Libraries have a superior ability to overcome time and space barriers and support many student activities. The effectiveness of the digital library in the educational sector is due to the development of e-learning; the digital library symbolizes the integration of library services and groups that work collectively to ensure a digital learning community also supports many activities for students, such as enhancing access to educational curricula, educational courses, lesson plans, programs, modeling and simulation, providing interactive digital content among members, and facilities for providing archiving and recommendation systems, selective dissemination of information, and copyright management.

One of the advantages of the digital library is that it includes printed electronic resources and other digital materials outside its administrative borders. It delivers essential information to everyone, contributes to providing permanent education opportunities, and enhances cooperation and communication between research fields. (Abu Auf, 2004), and it also offers many electronic services, such as providing a bibliographic search service through the library's automated catalog, searching databases to which the library subscribes, and virtual reference services such as responding to user inquiries via e-mail, and selective broadcasting and answering questions. Popular and providing electronic content (books, theses, scientific articles) with the possibility of downloading offers an attractive educational and research environment. (Owusu, Rodrigues & Van Der Walt,2019)

As a result of the complexity of e-learning requirements, it has become necessary for digital libraries to make an additional effort to provide users with better services by developing services that allow easy access to the content of interest, which requires setting standards that determine the type of electronic services that must be provided in digital libraries to activate digital learning activities, especially in light of the circumstances. Extraordinary cases such as COVID-19 Accordingly, the European Federation of Libraries and Associations (IFLA) stated that all libraries at all levels have created and promoted many digital services due to the imposed policy

of closure due to COVID-19 to support digital education and all its activities such as scientific research and development and to preserve health (IFLA,2020).

2.2 Scientific Research

It is an organized human behavior that aims to investigate the validity of given information, hypothesis, or clarification of a situation or a phenomenon, to understand its causes and mechanisms of treatment, or to find a successful solution to a specific or social behavioral problem of interest to the individual and society, or to test the success of new technologies for the development of production (Amour, 2012).

Scientific research is "the method used by the researcher for organized and precise investigation to discover new information or links, in addition to developing or correcting existing information. It follows the scientific method's examination, inquiry, and steps, as well as choosing the appropriate method and tools for research and data collection." That is, it is "the process of harnessing things and concepts." Concepts and symbols for generalization (Sami & Tariq,2012)

It is an organized intellectual process carried out by a person called the researcher to investigate the facts related to a specific issue or problem called the subject of the research by following an organized scientific process called the research method to reach appropriate solutions to the problem or results that are valid to generalize to similar problems called research results. (Hassan, 2020).

Governments and various institutions have realized the importance of comprehensive scientific research, which has doubled the interest in scientific research in multiple areas of life, as scientific research is one of the most critical aspects of intellectual activity. Educational institutions and universities contribute to encouraging scientific research, activating its movement, and supporting it by supporting researchers and professors to devote themselves to this task and providing the requirements to raise the scientific research level and benefit from its applications and results. (Ferm, Al-Naas, & Qiraa. 2020)Scientific research is considered one of the human mind's most sublime activities. It is an organized, productive intellectual effort that aims to create life, achieve development, renaissance or civilization, and build a better future. It is known that the progress of nations and their civilizational renaissance depends on several factors, the most important of which are: their care and interest in scientific research and its applications2.3. Relationship Between Digital Library and Scientific Research

The role of digital libraries is highlighted through their role in enabling researchers to complete scientific research, and secondly, the role of these libraries in developing the researcher. Today, researchers are in dire need of digital libraries that provide them with fast and accurate services. It contains data and information as vast information stores where information can be obtained. It is requested and prepared for retrieval. Accordingly, the digital library constitutes an influential factor in the completion of various research Scientific articles, whether scientific articles, interventions for national or international forums, or the completion of master's theses And Ph.D. The digital library contributes by providing scientific material from electronic sources and references for research, facilitating the process of scientific research by accessing digital library services in a short time and making it easy to view previous studies on the subject to avoid

scientific duplication in research topics. It facilitates the process of detecting scientific theft and forgery. It also helps detect the copying, imitation, or forgery process among digital documents (Amin & Bou Qandil, 2020). Knowledge management has been used to develop appropriate and robust models for improving staff performance, developing professional skills, enhancing human resource organization, and knowledge management techniques in developing the efficiency of academic libraries. As a result, organizing training for service staff, supporting innovative research projects, and providing library technology infrastructure will ultimately improve academic performance and research. (Rafi, Jian Ming, & Ahmad, 2022). Researchers expect digital libraries to bring about continuous changes in the orientation of beneficiaries towards information a digital library does not merely lead to an increase in economic benefits, saving expenses, and increasing the efficiency of access to information, but rather changes the habits of beneficiaries, as their relationship with all forms of information and with the people and events that constitute it changes continuously according to the changes that occur. It occurs in digital libraries and thus changes their habits. Digital libraries also contribute to the development of the researcher and the beneficiary of the training in the various processes that he carries out in the digital and technological field, which contribute to the formation of scientific competence in the field of research and communication in automated work through interaction with other beneficiaries. (Amin & Bou Qandil, 2020)

Therefore, based on the above evidence, the author hypothesized that H1: There is a statistically significant relationship between the digital library and the encouragement and support of scientific research among students and postgraduate students at the College of Business, King Khalid University, during COVID-19.

3. Methodology

3.1 Participants

The digital library came from the communications revolution and its applications, and it contains electronic information that represents all its contents. Thus, it does not need a building to house it; instead, it requires a group of servers and a network that connects it to users. It is global in its services and is considered one of the future libraries, as this research focuses on studying its impact on encouraging scientific research during 2020-2021. We expected to collect data from 120 samples of university students based on the rule of thumb suggested by the methodologist for sample size determination. Thus, according to Kerjcie and Morgan (1970) and Cohen (1969) table of minimum sample size (Krejcie and Morgan 1970; Sekaran 2003; Sekaran and Bougie 2016). As a result, we collected 70 through Google Forms questionnaires, which was attractive for increasing the degree of accuracy and achieving good results in the future.

3.2 Data analysis and results

The Data has been collected and cleaned to be ready for final analysis. Regarding the theory of testing, we conducted descriptive analysis for demographic data and descriptive analysis for items through SPSS 20.0 software, which ranged between 0.76 and 0.88 for all constructs' items in the study. In other words, internal consistency reliability (Cronbach's alpha) exceeded 0.70

for all items, which reached the minimum threshold above 0.70. Confirmatory Factor analysis (CFA) includes convergent and discriminant validity tests for assessing the reliability and validity of constructs. Next, the second test is to run the path coefficient analysis, mainly for hypotheses testing to come out with the results based on the primary data collected from the respondents.

Presentation and discussion of topics

Table (1) shows the arithmetic mean, standard deviation, percentage, and description for each of the first axis phrases.

The first axis, the Scientific research	percentage	Std. Deviation	Mean
1.	84.2	1.329	4.21
2.	93.2	.562	4.66
3.	90	.608	4.50
4.	89.4	.675	4.47
5.	89.8	.608	4.49
6.	82.2	1.084	4.11
7.	92.6	.594	4.63
8.	88	.769	4.40
The overall mean of the axis	88.6	0.778	4.43

Note: data extracted from SPSS 22.0

From the above table (1), we notice that in most of the statements of the first axis, the contribution of the digital library to the development of research is very high, and some of the statements are high.

Table (2) shows the arithmetic mean, standard deviation, percentage, and description for each of the phrases of the second axis.

The second axis Supports the digital library for scientific research	percentage	Std. Deviation	Mean
.1	84.2	1.329	4.21
.2	93.2	.562	4.66
.3	90	.608	4.50
.4	89.4	.675	4.47
.5	89.8	.608	4.49
.6	82.2	1.084	4.11
.7	92.6	.594	4.63
.8	88	.769	4.40
The overall mean of the axis	88.6	0.778	4.43

Note: data extracted from SPSS 22.0

From Table (2), the general trend of the respondents for all the phrases of the second axis (supporting the digital library for scientific research) all the statements strongly agree, which is very high, which indicates that the digital library Supports scientific research.

Hypothesis testing:

There are statistically significant differences regarding the digital library's contribution to scientific research development

Table (3) shows the chi-square test to test the first hypothesis

	The contribution of the digital library to the development of scientific research
Chi-Square	59.143 *
df	9
Asymp. Sig.	.000
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 7.0.	

Note: data extracted from SPSS 22.0

From Table (3) above, it was found that the value of chi-square (59.143*) was also reached (0.000) sig, which is less than the level of significance (0.05), which indicates the existence of statistically significant differences in the contribution of the digital library to the development of scientific research.

5. Discussion and Conclusion

Results decisions:

The digital library facilitates communication between academic researchers, faculty members, and students by accessing the digital library and exchanging ideas and information, which contributes to the development of scientific research. The digital library allows researchers to enter for free by logging into the university's electronic account, browsing the database, and benefiting from it. Graduate students focus on using the resources available in the digital library to accomplish their tasks and scientific research efficiently, enabling the effective use of library resources, as it provides the ability to store and retrieve a huge amount of data and be readily displayed (Ali, 2011). The digital library offers the researcher a vast amount of data and information in various fields, contributing to the continuity of scientific research, especially considering the Corona pandemic. The digital library helps overcome barriers and spatial borders between different countries and shortens the effort and time to obtain information remotely.

The entry of university libraries into the digitization system brought about radical developments in various fields, including the development of academic scientific research and its role in the spread of the digital system globally, which contributed to facilitating the task of searching for information, Developing the capabilities of the researcher in his scientific and technological training and creating the possibility for him to contribute more. In the field of scientific research. A digital space between various groups that contribute to developing scientific research and achieving quality in higher education. The results showed a significant relationship between the digital library and the support and encouragement of scientific research from the perspective of graduate students, as hypothesized in H1, which depicts a positive relationship between the digital library and the support and encouragement of scientific research. These results show that statistical evidence supports the proposed hypotheses. In addition, evidence has shown many positives to using the digital library to encourage and support scientific research, especially during COVID-19, and its effectiveness has been proven in this regard. The study recommended

holding specialized training courses on search strategies for researchers to achieve the best research results for electronic resources. They are directing researchers to adhere to the ethics of scientific research, which is positively reflected in the development and quality of scientific research. They are spreading the culture of digital awareness by preparing workshops for graduate students to introduce them to digital libraries and teach them how to use and activate them in the service of scientific research. On the other hand, there are some negative aspects, such as a lack of commitment to scientific research ethics.

Conclusion:

In conclusion, the need to demonstrate the importance of digital libraries and their presence at this time for the continuation of the educational process and the various activities associated with it, such as completing assignments, research, projects, and case studies that require research into multiple sources of information, this study aimed to know the relationship between the digital library and supporting and encouraging scientific research. These results opened the door widely for future researchers by studying the appropriate relationship between the digital library and the advantages of its use, as well as its reflection on the development and advancement of scientific research. A theoretical contribution in addition to its scientific contribution by providing new evidence for decision-makers who wish to know the digital library and its various sources and the vast capabilities it offers to researchers, which encourages them to research and explore

Acknowledgment

"The authors extend their appreciation to the Deanship of Research and Graduate Studies at King Khalid University for funding this work through small group research under grant number RGP1/84/45

WORKS CITED

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- Abu Auf, Ray of Eid Selim. (2004). Digital Library: Journal of Informatics. Volume(3)
- Ali, Ahmed. (2011). Digital Library Foundations, Concepts and Challenges Facing Arab Digital Libraries: Damascus University Journal. Volume (27), Issue (1).
- Amin, Mahi & Abdel Latif Qanadil. (2020). The Digital Library and its Role in Developing Scientific Research Algerian Journal of Legal, Political and Economic Sciences Volume 57, Issue: Special, Page: 176-186.
- Amyour, Siham. (2012). University libraries and their role in developing scientific research in the light of the electronic environment: an unpublished master's thesis, Mentouri University.
- Chang, C. L., & Fang, M. (2020)E-learning and online instructions of higher education during the 2019 novel coronavirus disease (COVID-19) epidemic. In Journal of Physics: Conference Series (Vol. 1574, No. 1, p. 012166). IOP Publishing.
- Cohen, P. J. (1969). Decision procedures for real and p-Adic fields. Communications on pure and applied mathematics, 22(2), 131-151.
- Fox, E. A., Akscyn, R. M., Furuta, R. K., & Leggett, J. J. (1995). Digital libraries. Communications of the ACM, 38(4), 22-28.
- Hassan, & Hassan Mohsen. (2020). The reality of scientific research in social work, obstacles and requirements for advancement: Journal of Educational Studies, Volume (51).
- IFLA .(2020). COVID-19 and the Global Library Field [En ligne]. [Document
- Lagoze, C., Krafft, D. B., Payette, S., & Jesuroga, S. (2005). What is a digital library anymore, anyway? D-Lib magazine, 11(11), 1082-9873.

- Morgan, K. (1970). Sample size determination using Krejcie and Morgan table. Kenya Projects Organization (KENPRO), 38, 607-610.
- Owusu-Ansah, C. M., Rodrigues, A. D. S., & Van Der Walt, T. B. (2019). Integrating Digital Libraries into Distance Education: A Review of Models, Roles, and Strategies. *Turkish Online Journal of Distance Education*, 20(2), 89-104.
- Rafi, M., Jian Ming, Z. and Ahmad, K. (2022), "Estimation of the knowledge management model for performance measurement in university libraries," *Library Hi Tech*, Vol. 40 No. 1, pp. 239-264.
- Rezaei Sharifabadi, S. (2006). How digital libraries can support e-learning. *The Electronic Library*, 24(3), 389-401.
- Sami Al-Khazindar, & Tariq Al-Asaad. (2012). The role of think tanks and studies in scientific research and public policy-making.
- Sayed, Rehab Fayez Ahmed. (2016). Assessment of digital libraries: A knowledge magazine. Volume (17).
- Seadle, M., & Greifeneder, E. (2007). Defining a digital library. *Library Hi Tech*, 25(2), 169-173.
- Sekaran, U. (2016). *Research methods for business: A skill building approach*.
- Sekaran, U., & Bougie, R. (2003). *Research methods for business: A skill building approach*. John Wiley & Sons, Inc.
- Sumner, T., Khoo, M., Recker, M., & Marlino, M. (2003). Understanding educator perceptions of "quality" in digital libraries. In 2003, Joint Conference on Digital Libraries, 2003. Proceedings. (pp. 269-279). IEEE.
- Tayeb Ferm, Bou Rabeh Al-Naas, & Tayeb Qiraa. (2020). Electronic publishing and its impact on the development of scientific research: *Al-Baheth Journal for Mathematical and Social Sciences*. Volume (1), Issue (3).
- Zaghdoud, Marj. (2020). The impact of digital transformation on education approaches: e-learning - a case study of the National Office for Distance Education and Training." *Journal of the Faculty of Economics for Scientific Research*, Volume (6).
- Zaidi, Hasniya. (2010). *The Arab Digital Library: Theoretical and Philosophical Foundations*, Riyadh, Saudi Arabia: Arab Federation for Libraries and Information. pp. 193-217