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Importance of scientific research for Achieving Sustainable Development Goals during Covid19 Pandemic: Northern Technical University - A Case Study

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Abstract. Scientific progress in any country is measured by the importance that is given to scientific research. Recently, the interest in scientific research has increased by the local and international universities in various fields of sciences, given its importance in achieving sustainable development goals, where several countries and universities have initiated to increase scientific research funds. Moreover, the reputation of scientific research in the universities strongly depends on the quality and quantity of papers that are published in the international journals. Thus, the main goal of this study is to investigate and identify the reality of the scientific research situation at Northern Technical University during Covid19 Pandemic (i.e., from 2020 till now). This study is based on the descriptive approach and method of analysis for the published papers that related to the sustainable development topics, which is adopted by UI GreenMetric ranking. The data of the published papers have been collected from the Google Scholar website using the same methodology that was approved in the UI GreenMetric ranking. Those publications have been classified based on the keywords, university researchers and the affiliation of the university's colleges and institutes. The present data has been compared with data of previous years.

Keyword:

UI Green metric, sustainability, renewable energy, environment

1. Introduction

Northern Technical University (NTU) in Iraq was founded in 2014 after the reorganization of the Foundation of Technical Education to four universities, including the young Northern Technical University. The university covers three governorates (Nineveh, Kirkuk, and Salah al-Din) which located in the north of Iraq with ten colleges and technical institutes that emulate, with their outputs, the need of society and the labor market, NTU can consider the gateway through which scientists and leaders are made in the technical society from rationing in the various fields of science and knowledge. The most important tools of progress are subject to progress in the field of scientific research, and global experiences confirm this. The Arab world will remain in the area of imitation and consumption, and the media will not reach the level of global benchmarking in terms of universities, sizes and numbers, rather, it is actually real and accomplished on the ground [1]. The invention of scientific research depends on providing a good scientific environment for the researchers to carry out their works at the required level, and then the role of official institutions will come to help bring the results of scientific research from darkness to light and from theoretical scientific corridors to fields of work. Scientific research contributes to the revitalization and growth of the researcher's mind and its contribution to the development of human capital, which in turn contributes to achieving sustainable development. Starting from achieving economic development to keep pace with the requirements of the labor market by providing it with qualified manpower, who in turn carry out the planning and implementation of economic programs, and secondly, to achieve social development, which allows achieving development for society and Improving the quality of its life based on the optimal use of available resources and search for alternative resources to ensure a better life for future generations [2]. Therefore, many researchers agree that scientific research has an important role in achieving sustainable development goals, and our country, Iraq, is among the countries to implement a policy to achieve what can be achieved from those goals, including adopting a policy to support and restore scientific research, believing that it is the best way for development and this is evident It is clear through the developments that have taken place at the university since its establishment to the present day, whether in terms of administrative or financial support or through motivating researchers. What is sustainable development: Economic thought has witnessed a great development in recent times, after the interest was based only on growth, and a new term called development recently entered, but this term also witnessed a revolution and an additional term was introduced, namely sustainable development, whose concepts changed and varied according to the elements and conditions that it included. The concept of economic growth: Growth is an important and vital matter to improve the standard of living of individuals. It is defined as [3]: "the steady increase in the economy's capabilities to produce goods and services desired by society" and it is "the continuous increase in the average real individual income over time." The concept of development: its definitions are many, and it can be defined as "many believe that the terms growth and development are synonymous with each other, as both refer to an increase in the gross national product over a long period of time." It is also known as "a comprehensive, continuous, directed and conscious process that touches the aspects of society and the continuous improvement of the quality of life in it by optimizing the available resources and capabilities." It has known a great development and this development was a realistic response to the nature of the problems faced by societies, and a true reflection of the international experiences that have accumulated over time in this field. In general, two stages of development can be

distinguished. We find economic development, which means an increase in the average per capita of the gross national product, and human development, which means providing the basic needs of man such as health, education, housing and others [3]. The United Nations Development Program defines it as “development that allows meeting the needs and requirements of present generations without compromising the ability of future generations to meet their needs.” As for the World Bank, it defined it: “development that is concerned with achieving continuous equality that ensures that the same current opportunities are available to future generations by ensuring the stability of Human capital or continuous increase over time”, “through the development of development programs that achieve the goal of satisfying human needs without violating natural resources, taking into account without prejudice to standards of justice and social and environmental equality between generations.”[4].

2. Scientific Research and Sustainable Development

In order to achieve sustainable development in any country, there will be a need for appropriate competencies that are able to take responsibility and the initiative, which requires relying on modern methods in the ways of providing knowledge and science [5]. Here, the role of scientific research will be highlighted in achieving this and identifying the ways in which future generations will learn how to address the complexity that characterizes sustainable development, which appears through:

1. Activating the research movement of all languages and specializations within the university-
2. Employing the capabilities of the university and 1.21 points and making it sustainable development,
3. Focusing on scientific research on finding solutions for sustainable development.

3. Study methodology and procedures:

The current study relied on the descriptive approach using content analysis, where the data collection was based on scientific reports issued by the colleges and institutes of the university and were matched to what is documented in the Google platform for the scientific researcher, and the steps and procedures used to achieve the goal of the study can be clarified as follows

1. Follow-up to the university's publications for the period 2014 and up to the preparation of this study.
2. The study relied on publications related to sustainable development topics and objectives and included in Google Scholar databases. These publications varied between articles, research and working papers submitted to local and international conferences.
3. The study also touched on the international bodies cooperating in scientific publishing with university researchers in the fields of sustainable development
4. After collecting the data, the analysis process was carried out and the appropriate results, recommendations and suggestions were presented

The total number of research pins on the google scholar site is about 1130 research papers and various working papers in all fields of science and knowledge for the period 2014-2021 as shown in Fig.1.

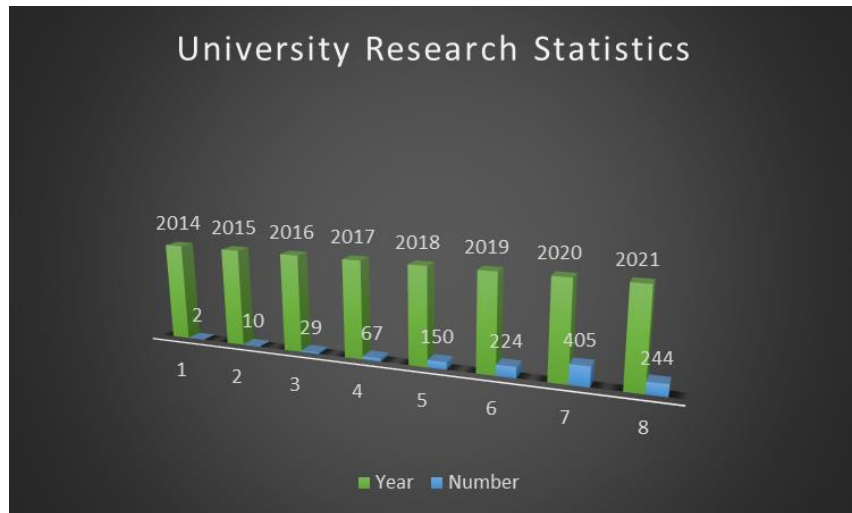


Figure 1. University Research Statistics

The above figure shows the remarkable increase in the number of research and working papers published in international journals and international and local conferences. The number of research published in the year 2014 when the university was created was only two research, while the number of research published during the year 2020 was only about 405 research and during the year 2021 the number of research published until the preparation of this study is 244 research in various scientific disciplines. Turning to the research related to sustainability topics and its goals, we note that the number of published research is 264 research and working papers, and this number represents 23% of the university's research related to sustainable development topics and objectives.

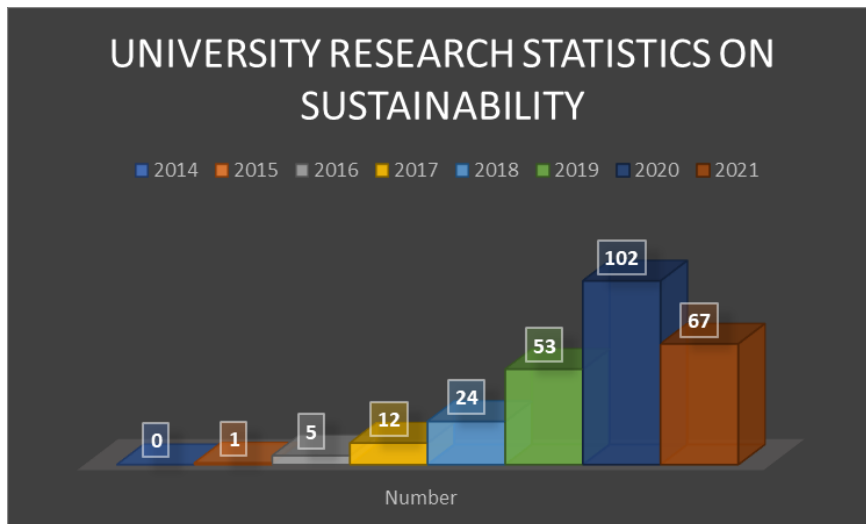


Figure 2. University Research Statistics on Sustainability

The Corona pandemic in Iraq began to spread with the registration of the first confirmed case of infection in Najaf Governorate on February 24, 2020, after which the government took the decision to close schools and universities until further notice. The repercussions of the complete closure in Iraq is a positive effect for a group of university

researchers to devote themselves to completing their research and studies and to continue their work entrusted to them despite these difficulties. Only 53 research papers were published in 2019, while the number is increased to 102 scientific papers published in 2020 and until writing this study there are 67 research papers in different topics of sustainability.

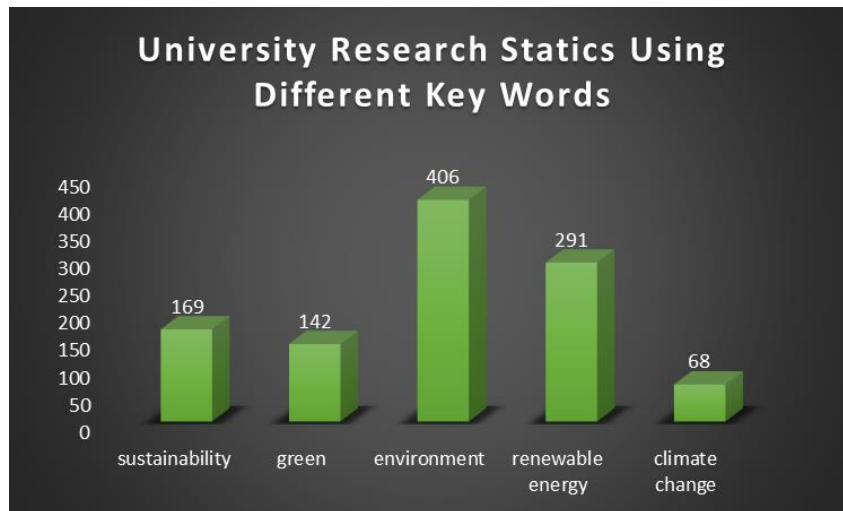


Figure 3. University Research Statistics on Sustainability Using different Keywords

The figure shown above determines the published papers by the university’s researchers depending on the keywords (sustainability, green, environment, renewable energy and climate change) during Covid19 Pandemic and as it is clear from this good publication compared to the number of university researchers installed on the Google Scholar website.

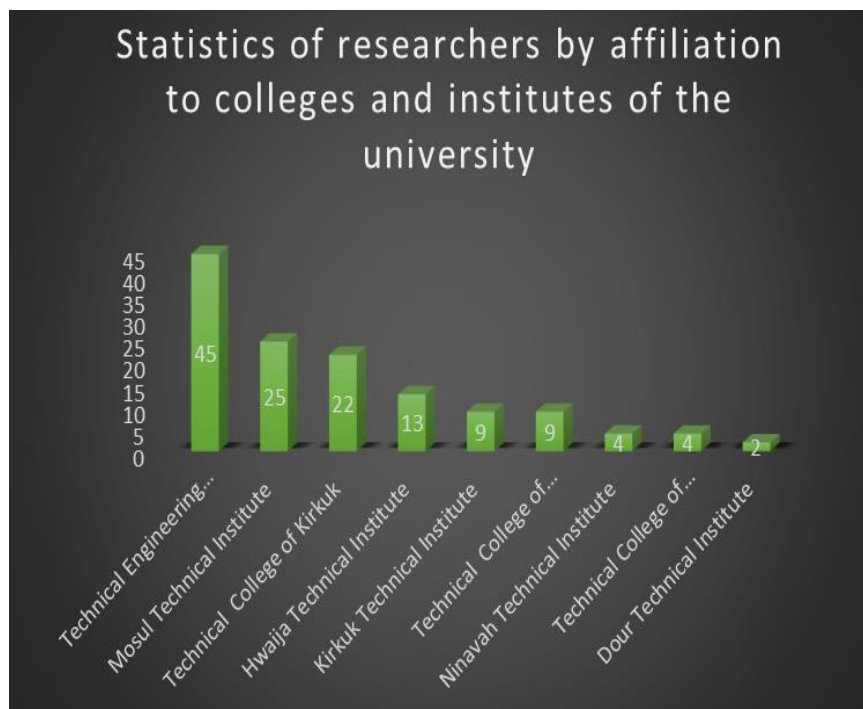


Figure 4. University Research Statistics on Sustainability by Affiliation

As mentioned earlier, the university consists of five colleges and five institutes geographically distributed over three major cities north of the capital, Baghdad. The above figure represents the research activity of the researchers of those colleges and institutes in the fields of sustainability with the presentation that one college has been split into two colleges recently, but within the statistics we kept their data as one college. In the table below is a list of a group of our university researchers who have a variety of scientific publications related to sustainability issues and its goals. The table shows the number of their research, the number of citations they obtained, in addition to one of their scientific research interests.

Table 1. List of a group of researchers in NTU

Name	Papers	Cited by	Research Interests
obed majeed ali	96	1561	Renewable Energy
Eethar Thanon Dawood	78	700	Construction Materials
Prof. Dr. Rafie Rushdy Mohammed	19	523	pollution
Prof. Dr. Omer Khalil Ahmed	64	473	Energy modelling
Omar Rafae Alomar	30	281	Sustainable Development
OMAR HAZEM MOHAMMED	34	265	wind power
Alyaa A. Al-Attar	43	101	Construction Material
Awad Essa Mohammed	11	54	Wastewater Treatment

4. Summary/ Concluding Remarks

It is concluded from this modest study that despite the young age of this young university and despite all the difficulties that faced its faculties and institutes, as well as the lack of cadres and the increase in the number of students, the university's research and scientific balance continues to grow and increase, especially in the areas related to achieving sustainable development and its goals. The pandemic period gave impetus to university researchers to publish more research and motivated them to participate in many specialized international scientific conferences and forums.

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