Higher Education Research in Iraq: A Bibliometric Analysis

Osamah Mohammed Jasim[1], Abhirup Nandy[1], Nitisha Aggarwal[1], Geetika Jain Saxena[2], Amit Pundir[2], Sanjeev Singh[1,*]

[1]Institute of Informatics and Communication, University of Delhi - South Campus, New Delhi, INDIA.
[2]Department of Electronics, Maharaja Agrasen College, University of Delhi, New Delhi, INDIA.

ABSTRACT

Aim and Background: Iraq's higher education system, a key part of the Middle East's academic scene, suffered significantly from regional socio-political issues in the 1990s. Fundamental changes, however, have been occurring in the government's mindset and the academic life of the country since the post-2003 era. Along with new reforms and policies, Iraq has been issuing more articles annually about higher education. This study aims to respond to the initial question: Is Iraq's higher education landscape progressing towards global standards?. **Methodology:** Bibliometric data were collected from Scopus and Web of Science covering the years 1983 - 2024, resulting in a curated dataset of 137 documents (articles and reviews). The analysis employed bibliometric metrics including the h-index for publication trends, co-authorship networks for collaboration, and thematic clusters for research trends. Analytical work was conducted using Python and the Bibliometrix R package. **Results:** The findings show rising trends in publications, with a steep rise in published output starting from the year 2015 and extending up to the year 2020. Iraqi Higher Education Institutions (HEIs) have formed strategic national and international collaborations, resulting in high collaborative output with countries such as the USA, Malaysia, and the UK. In addition, the study reveals a clear change in the trend of topic fields, from traditional fields of research to modern topic fields pertinent to the Higher Education setting. **Conclusion:** Iraqi HEIs have significantly improved their research productivity and collaboration networks, contributing to a more robust and internationally engaged scholarly community. Notable thematic shifts underscore a drive for greater representation and recognition on global ranking platforms such as THE, QS, and ARWU. Sustained efforts to internationalize education and adopt global best practices are essential for maintaining this positive trajectory.

Keywords: Iraqi Higher Education, Research productivity, Educational landscape, Higher Education Institutions (HEIs), Bibliometric analysis.

Correspondence:
Sanjeev Singh
Institute of Informatics and Communication, University of Delhi - South Campus, New Delhi, INDIA.
Email: sanjeev@south.du.ac.in
ORCID: 0000-0002-2416-7011

INTRODUCTION

Throughout history, Iraq has been regarded as the intellectual capital and the educational home for the Middle East region. While its ancient roots in learning, such as the 'edubba' schools, are foundational to its intellectual heritage, this study focuses on more recent developments in its higher education landscape.[1] The formation of the University of Baghdad in 1957 was one of the major events in the academic timeline of Iraq. It became one of the largest and most influential academic institutions, drawing scholars from the neighbouring regions.[2,3] The Iraqi government has also heavily invested in the Higher Education framework during the time, which promoted the accessibility of higher education to the public.[4] This, in turn, led to an overall increase in literacy rates in the country, which indirectly aided the growth of the higher education landscape of Iraq.[5] However, since the 1990s, Iraq has been facing several socio-political issues that have created a major imbalance in the growth of the Higher Education Institutions (HEIs). The scholars in the HEIs faced various challenges and were forced to leave their research or flee, leading to a significant brain drain and an estimated 90% decrease in research personnel. Despite these setbacks, the post-2003 era has marked a substantial transformation. This led to a slow and steady growth of the research output of the HEIs and a significant improvement in the quality and quantity of academic publications.[6-8] This revitalisation of the education landscape of the country led to a new generation of scholars and researchers. Consequently, the Iraqi HEIs began to gain global recognition, contributing to the country's broader socio-economic development and intellectual advancement.

With the growth of the Iraqi HEIs, the country has introduced several policies and reforms to define the development of the research environment.[9,10] Both the Iraqi region as well as the Kurdistan region of the country have started to improve and progress on their higher education aims and regulations.

Currently, there is a need to analyse these implemented policies and their results within the HEIs to understand their impact on global competitiveness. Bibliometrics presents a systematic approach to quantitative and qualitative analysis of the research performance, impact, and trends.[11-14] Such studies can reveal several patterns in research productivity and collaboration networks, therefore identifying the emerging trends in research, and tracking the impact of the implemented policy changes on the research productivity of HEIs.[15,16] For Iraqi HEIs, a precise bibliometric assessment is particularly vital as they strive to enhance their global visibility and achieve recognition on international ranking platforms. Despite the growing literature on bibliometric analysis, a specific, comprehensive study focusing on the evolving research landscape of Iraqi HEIs and its implications for international alignment remains largely underexplored.

This study has a set of multi-layered objectives, which can provide a comprehensive understanding of the research landscape of Iraq. Primarily, this analysis would help to:

- Quantify and analyze the research productivity of Iraqi Higher Education Institutions.

- Identify the thematic growth and evolution of research within Iraqi HEIs.

- Examine and verify the major collaboration networks and patterns of Iraqi HEIs.

By addressing these goals, the study aims to provide an exhaustive assessment of the growing landscape of Iraqi HEIs. Moreover, this research would also showcase the Iraqi scholars' potential and demonstrate their contribution to global academia.

LITERATURE REVIEW

The educational landscape in Iraq can be dated back to many centuries ago. During the golden age of Islam (8th to 14th century), Baghdad developed as a centre for knowledge, notably in Mathematics, Astronomy and Medicine.[17,18] However, there has been a major stagnation in academic progress, due to various political challenges brought forth by the Ottoman rule over the centuries. In 1957, the establishment of the University of Baghdad was a critical milestone in the higher education of Iraq, and the country became an attraction for scholars from nearby regions.[2] This led to changes in the Iraqi government's policies regarding academia and resulted in investments from both the public and private sectors.

While there was progress during this time, Iraq's educational resources and infrastructure saw a significant drop in the 1990s due to sociopolitical unrest made worse by the Gulf War and international sanctions. This led to a huge brain drain and a loss of literature resources,[4] as well as a substantial loss of scholars and a sharp decline in research productivity.[5,19,20] Significantly, a large portion of this era's research is still not well documented in academic databases like as Web of Science (WoS) or Scopus, which makes it difficult to conduct a thorough evaluation of HEI advancement.

However, the post-2003 era has witnessed concerted efforts to restore Iraq's higher education system. This has created opportunities to enhance Iraq's academic capabilities, laying a foundation for the country's future growth and development.[21]

Within the expanding higher education landscape of Iraq, the task of assessing the HEIs has become important. This would help with the future directions to be taken by the stakeholders of the Iraqi academia, which includes scholars, researchers, and policyholders. The socio-political turmoil of the 1990s has destroyed a major part of the HEIs, including infrastructure, personnel and resources. This led to a massive brain drain in the country and a loss of various literature resources within the HEIs.[4] Additionally, most of the research articles from this period have not been recorded in scholarly databases like the Scopus of the Web of Science (WoS) database. This has made it difficult to track the progress and achievements of these HEIs. Nevertheless, there has been steady progress in the resumption of the research post-2003. The international sanctions being lifted from Iraq paved the way for increased government funding as well as public investments, towards the overall goal of rebuilding Iraq's higher education system. There have been many policy reforms that pushed forward the overall growth of Iraqi higher education-reconstruction of HEI infrastructure, ease of education policies by the government, fostering of international collaborations, and so on. Many foreign programs also aided the country-the Higher Education and Development (HEAD) initiative was launched by USAID in 2004.[22] This program aimed to help the HEIs to rebuild their infrastructure and enhance their academic excellence. Alongside such reforms, another aspect of the period was the crucial change in leadership, which helped in fostering innovation, providing better funding and resources, and promoting collaborations at a domestic as well as global level. These changes were vital to the regrowth of the country after a long period of turmoil.[23-25]

Despite these advancements in Iraqi academia, the Iraqi HEIs have continued to face challenges in the global academic map. The institutions have very little presence in different global rankings, like the Times Higher Education (THE) rankings, the Quacquarelli Symonds (QS) rankings and the ShanghaiRanking's Academic Ranking of World Universities (ARWU).[26,27] Scholars attribute this struggle for international inclusion to factors such as limited research capacity, financial resources, and scholarly motivation, a challenge particularly prevalent in institutions from Global South countries.[28-30] Quality assurance issues, notably in the Kurdistan region,[25] also impact governance strategies focused on inclusivity.[28,30] They noted that the institutions in the Global South countries are particularly exposed to these challenges, which makes it difficult for them to compete with

other developed countries. Further, these issues also reflect the total research output in the country. From 1919 to 2010, Iraq produced an estimated total of 12,778 academic documents, with a notable rise in output post-2003. However, in recent decades, Iraq peaked at 5,930 publications in 2010, which shows steady progress in the post-war era of the country.[31] The limited presence of high-impact journals, restricted funding in research and various other factors continue to challenge Iraq's participation in the global rankings. Without comprehensive reforms and expanded collaboration networks, achieving global recognition remains an uphill battle for Iraqi HEIs.

To provide a comprehensive understanding of these dynamics and inform future policy, assessing the current educational landscape and reviewing research productivity is critical. This analysis can be performed by assessing the literature related to the country's higher educational framework. Bibliometric studies can be easily used as a valuable tool to generate insights into the research in the Iraqi HEIs. Such an analysis would help to-determine past and future research trends, look for domestic and global collaboration patterns, and analyse the productivity and impact of the research. Such studies would use various parametric indicators and factors like publication number, the impact of the publications, and how the HEIs are working together to share knowledge.[15] Previous bibliometric analyses in the region[2] focusing on similar post-conflict/emerging nations like Syria, Qatar, Kuwait, UAE, Jordan, Iran, Saudi Arabia, and Turkey, have provided insights into growing collaboration trends (e.g., with European countries, the US, and neighbouring Arab states) and emerging thematic areas like e-learning.[32-34] However, these studies often lack the comprehensive, multi-faceted analysis needed to fully assess the evolving research landscape of Iraqi HEIs in relation to their current drive for internationalization and global ranking.

Therefore, this present bibliometric study offers a comprehensive and updated picture of the existing state of Iraqi HEIs, aiming to fill this specific gap by providing granular insights into their research productivity, collaboration networks, and thematic shifts within the context of global academic competitiveness.

METHODOLOGY

The study was performed on a bibliometric dataset from two different scholarly databases: Scopus and Web of Science (WoS). Both are reputable scholarly databases, which offer a wide set of article meta-data attributes. For this study, a list of keywords, as mentioned in Table 1, has been used. These keywords have been curated from a set of related literature on the topic and focus on both generic well as specific terms. They pertain to HEIs, ranking frameworks, and educational quality assurance systems. Then two different queries were made to the databases based on these keywords.

The specific queries used for the two databases are mentioned in Appendix A.

After the data collection step, the raw data from both datasets were merged based on their DOIs. This resulted in a total of 137 documents, which consisted only of Articles and Review articles. The period of the data collected is from 1983 to 2024 (December 2024), with a span of 42 years. This long timeline was chosen to introduce latent trends within the sub-frames of the whole period. Such trends can be easily determined based on factors like research productivity, collaboration networks and thematic mapping of the research done in the HEIs.

The primary analysis was done using various Python libraries and R packages. The bibliometrix package[35] was extensively used to analyse the data and extract relevant charts and graphs visually. Figure 1 describes the data flow and the methodology of our research. A total of 157 documents have been downloaded from the two databases. These documents were merged using their DOIs, and 137 documents have been selected for our study. For our study, we have performed four types of analysis on the data for different purposes.

Bibliometric Analysis

This included evaluating the annual publication trends, citation patterns over time and growth rates (e.g., CAGR). This helped assess the overall research productivity and scholarly impact of Iraqi HEIs over time.

Keyword Analysis

We examined both author keywords and keywords plus to identify dominant and emerging research themes, track the evolution of thematic focus, construct thematic maps and word co-occurrence networks. This analysis revealed shifting trends from traditional to modern research topics, including e-learning and quality assurance.

Affiliation Network Analysis

Using affiliations and country data, we have mapped institutional and international collaboration networks, identified the most productive institutions in Iraq and Kurdistan and assessed domestic vs. global partnership patterns. This helped uncover the role of collaborations in boosting research output and impact.

Statistical Analysis

This included descriptive statistics and a comparative analysis between Iraq and neighbouring countries (e.g., Turkey, Iran, Saudi Arabia). These insights provided a benchmarking framework for Iraqi HEIs in a regional context.

The detailed results show the various research trends of Iraq, using various bibliometric and statistical indicators to validate our findings.

RESULTS AND ANALYSIS

Publication Trends

The current study focuses on the research and development of HEIs, and the academic landscape of Iraq. It examines the research trends in the country over 42 years and analyses 137 publications related to the theme. During the mentioned period, the publications have gathered a total of 1,787 citations, with an average of 13.04 citations per paper. This indicates the relatively high impact of the research and a strong focus on the subject. The CAGR for the publications is 8.56% for the years 1983 to 2024, which is low compared to the neighbouring countries of Iran (12.97%), Turkey (15.15%), Saudi Arabia (15.54%), Syria (10.41%), Qatar (21.25%), Kuwait (14.59%), Jordan (12.61%) and the UAE (24.26%).

The CAGR is calculated using the formula $CAGR = \left(\frac{count_{final}}{count_{start}}\right)^{\frac{1}{year_{final}-year_{start}}} - 1$,

where $count_{final}$ and $count_{start}$ refers to the number of publications that were published in the years $year_{final}$ and $year_{start}$ respectively. Figure 2 shows the year-wise growth of the research productivity. We can observe a significant difference between the two sub-frames of the timeline. From the early 1980s to 2003, there has not been any documented research on the topic. This period coincided with Iraq's challenging circumstances, including political instability and international sanctions, which hindered academic advancement. However, since 2003, there has been a steady growth of publications each year. The trend becomes more pronounced from 2015 onwards, corresponding to renewed policy focus, increased academic funding, and greater engagement with international academic networks. Notably, the number of publications rose to 25 in 2023 and peaked at 29 in 2024, indicating increased scholarly momentum.

The red dashed line represents a linear trendline, with an R^2 value of 0.41, indicating a moderate but statistically visible correlation between publication year and the number of outputs. This suggests that while there is a positive overall trend, growth has not been entirely linear - reflecting periods of both stagnation and acceleration due to shifting academic and national contexts.

Figure 3 shows the annual citation impact of the publications. The chart shows an increase in citations from the later part of the first decade of the 2000s, with a substantial rise since 2014. There are more than 400 citations to these articles in 2019, which shows the overall importance and impact of publications. Hence, these two figures not only indicate an increase in the quantity of research but also its impact and visibility in the academic community.

Figure 4 shows the overall Open Access levels of the publications. We can see that more than 42% of the publications are made Open Access, which shows that Iraqi HEIs are increasingly prioritising wider dissemination and accessibility of research. This reflects a growing commitment towards transparency, public engagement, and alignment with global academic practices aimed at enhancing the visibility and impact of scholarly output.

Keyword Analysis

A keyword-based analysis is an important bibliometric tool to extract and observe the thematic map of the research fields. Figure 5 illustrates the most common author-provided keywords within the dataset. The most impactful keywords include "higher education", "knowledge management", "e-learning", and so on. This reveals a set of prevalent topics in the research community, on the country's Higher Education policies.

However, in recent times, there has been a shift in the research trends towards enhancing higher education in Iraq towards global standards. The growing focus on topics like sustainable development and knowledge sharing reflects this change. Additionally, the growing interest in organizational performance and academic performance contributes to the development of research on the standardization of educational policies.

Moreover, there is also a clear trend in research towards an e-learning paradigm, with a focus on online education and mobile learning, which has been growing since the COVID-19 period. Furthermore, we can also observe modern themes like the Internet of Things becoming a prevalent area of research. This modification involves various strategies to update traditional research themes to modern trends in research.

Figure 6 shows a gradual growth in the research trends, and its effect on the publication count over the years. The rise in trending topics such as knowledge management, knowledge sharing, and higher education institutions paralleled an increase in publication counts from 2016 to 2022. More emerging themes like sustainability, organizational performance, and learning system might point towards a growing need for academic inclusivity within the international university rankings. The theme of higher education has been a central research focus in Iraq since 2015-16, with consistent growth in publications. This underlines

Table 1: List of Keywords used to retrieve related documents from the databases.

Higher Education Institution*	Academic Institution*
Higher Education System	Higher Education Framework*
Institutional Ranking*	Academic Audit
Quality Assurance in Higher Education	National Accreditation System
International University Ranking*	World University Ranking*
Global University Ranking*	Quality Evaluation in Higher Education
HEIs	Higher Educational Ranking Framework

the country's acknowledgment of the sector's significance and its sustained efforts to advance higher education.

The thematic landscape of Iraqi higher education research is delineated in Figure 7, where the relevance and evolution of various research themes are systematically presented. A set of niche themes, contextually tied to the dataset specific to Iraqi Higher Education Institutions (HEIs), is identified as significant within the study. Within the Niche quadrant, themes such as "higher education institutions" are positioned, noted for their limited citation impact yet high relevance to the Iraqi academic context. By contrast, emerging themes, including "organizational performance" and "e-learning," are situated in the Emerging quadrant, reflecting that increased scholarly attention is being directed toward performance assessment and digital education within Iraqi HEIs. This shift is likely influenced by efforts to align with global educational standards and enhance international ranking visibility.[36] The analysis underscores the dynamic adaptation of Iraqi HEIs to contemporary academic significances, confirming their commitment to advancing the higher education sector.

Collaborations

Institutional collaborations help in the overall growth of institutions, and the analysis of such networks helps to uncover various research opportunities. From the data, we can observe how collaboration patterns play a significant role in research productivity. Both domestic as well as international collaborations help the HEIs to improve the modernisation of research trends and increase their impact in the community. Figure 8 demonstrates that most of the Iraqi research has been with domestic collaborations and with authors from the same institutions, but there have been some global networks in the research productivity. Figure 9 shows the most relevant countries that Iraq has collaborated with to improve their education policies.

The top five nations that have collaborated with Iraq include the USA, Malaysia, the UK, Lebanon and the Netherlands. This increase in the partnership implies a varied set of research topics, with researchers working with other developed or developing countries to enhance the country's higher education sector.

Furthermore, Figure 10 shows a list of universities that have been the most active within the domain of Iraqi higher education. We have distributed the affiliations among the Iraq region, the Kurdistan region and other countries. Here, we can observe that both regions of Iraq and Kurdistan have been seeing relevant progress in the subject. Institutions like Sulaimani Polytechnic University, Hawler Medical University, University of Zakho, and University of Duhok have been among the top-performing institutions in the study. Although the most productive institutes have been the University of Baghdad and the University of Basrah, the other institutions in Iraq have also been steadily focussed on the subject.

DISCUSSION

The bibliometric study reveals several patterns in research productivity in the Iraqi higher education landscape. There has been a steady increase in publications over the last two decades, reflecting the gradual recovery of the educational sector from socio-political instability. This increase in the research output correlates with the government's efforts to revitalise the higher education system of Iraq. This improvement includes a shift towards modern topics like quality assurance, and the adoption of recent global trends like the e-learning paradigm. The study also shows a significant rise in the research after 2015, which indicates the newly introduced policy reforms towards the inclusion of HEIs in the global community. Although early research was mostly centred around traditional themes; recent trends show a noticeable transition towards modern themes such as e-learning,
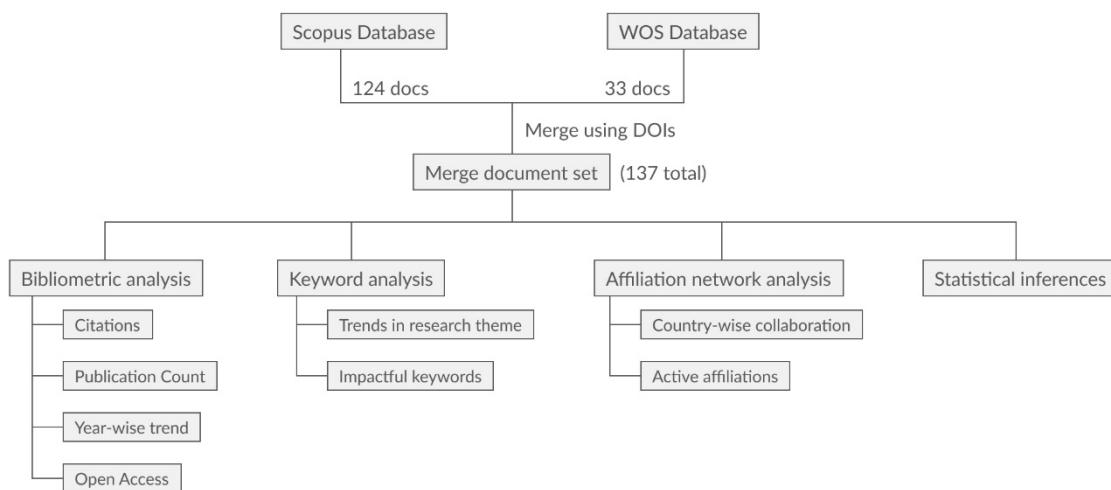

Figure 1: Flowchart of the data collection and methodology of the study.

quality assurance, and knowledge management. The changes in the citation impact patterns reflect the impact of the academic community. It also indicates an improvement in the globalisation of the Iraqi HEIs, with an expanded visibility of the HEIs in the global academic societies.

The study reflects a comprehensive picture of Iraq's current research output. It also uncovers some domains of the research that can be further explored. First, more focused research topics should identify the challenges that affect research productivity in Iraq, including poor resources, political instability, and loss of researchers. These factors have contributed to the slowed-down progress of Iraq's academia, and a detailed analysis of how they are being addressed can provide valuable insights for policymakers and institutional leaders. The persistent issue of institutional inertia further intensifies these challenges, hindering the agile adoption of necessary reforms and innovations. Furthermore, the constantly expanding selection of online learning tools within the higher education systems requires further investigation of the adaptability of key technologies. Other research can further investigate the difficulties of developing a digital learning

paradigm in the country. Addressing these issues with specific reforms and investments in infrastructure, faculty development, and research funding are crucial for improving Iraq's global academic competitiveness.

The study reveals that early research in Iraqi HEIs was mostly centred around traditional themes. While there is a noticeable transition towards modern themes like e-learning, quality assurance, and knowledge management, the quality of collaborations, both domestic and international, needs further scrutiny. While there has been an increase in domestic collaboration, its impact on research quality and visibility, beyond mere volume, requires deeper investigation. This suggests potential policy-research disconnect where efforts to boost collaboration might not always align with enhancing the quality and global relevance of research output. Further analysis should explore how the academic diaspora could contribute more effectively to enhancing research output and international partnerships, leveraging their global networks and expertise. This is particularly relevant given Iraq's lagging position compared to regional peers.
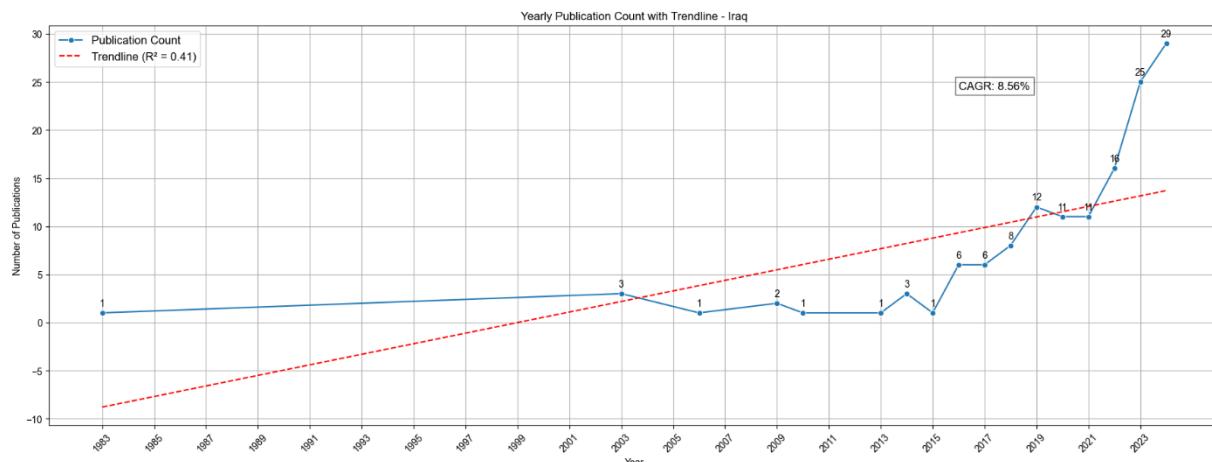

Figure 2: Annual research publications count.
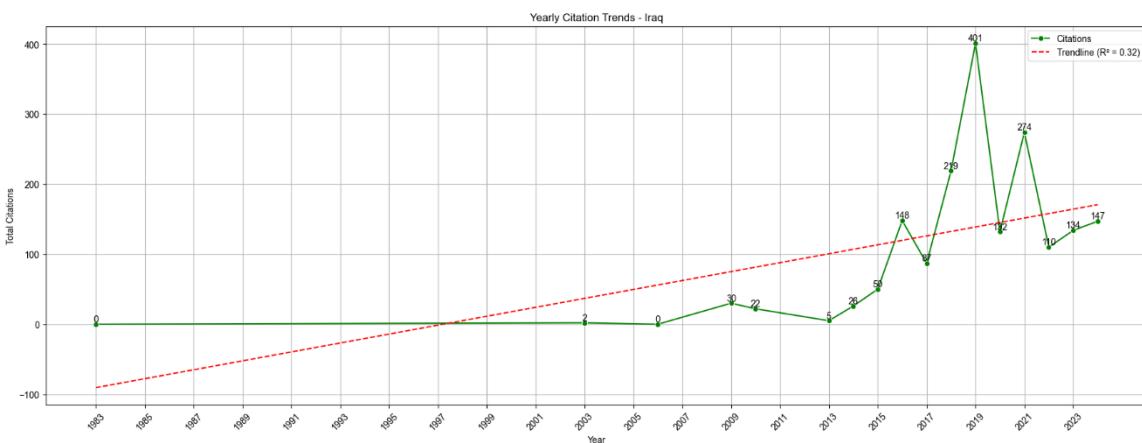
Figure 3: Annual citation counts of relevant research publications.

Open Access Analysis - Iraq

Open Access vs Non-Open Access
Iraq

Open Access Types Distribution
Iraq
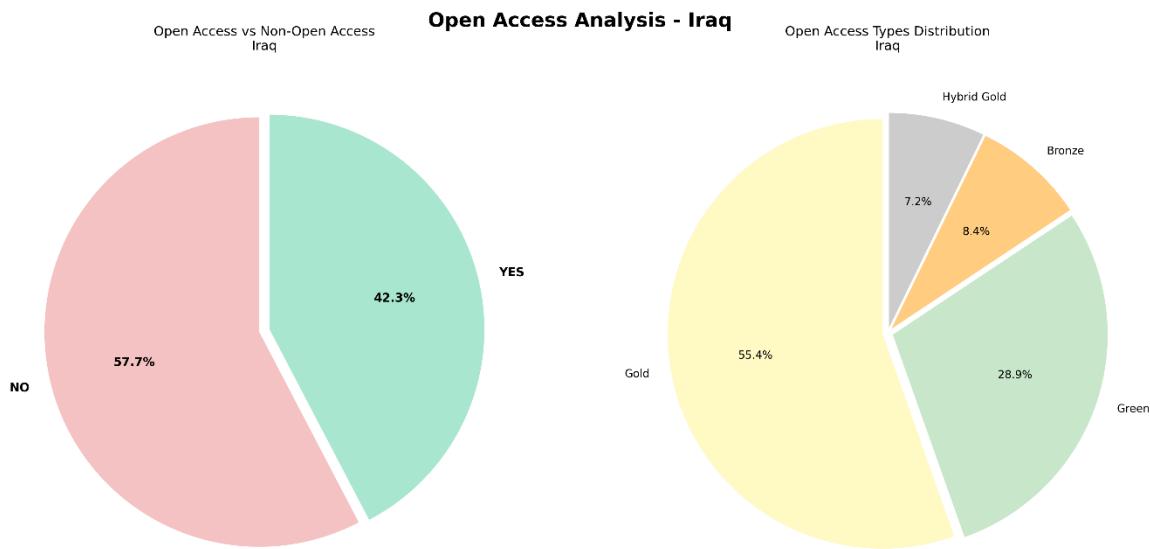
Figure 4: Open Access levels of Iraqi HEI Research.

Keyword Word Cloud - Iraq
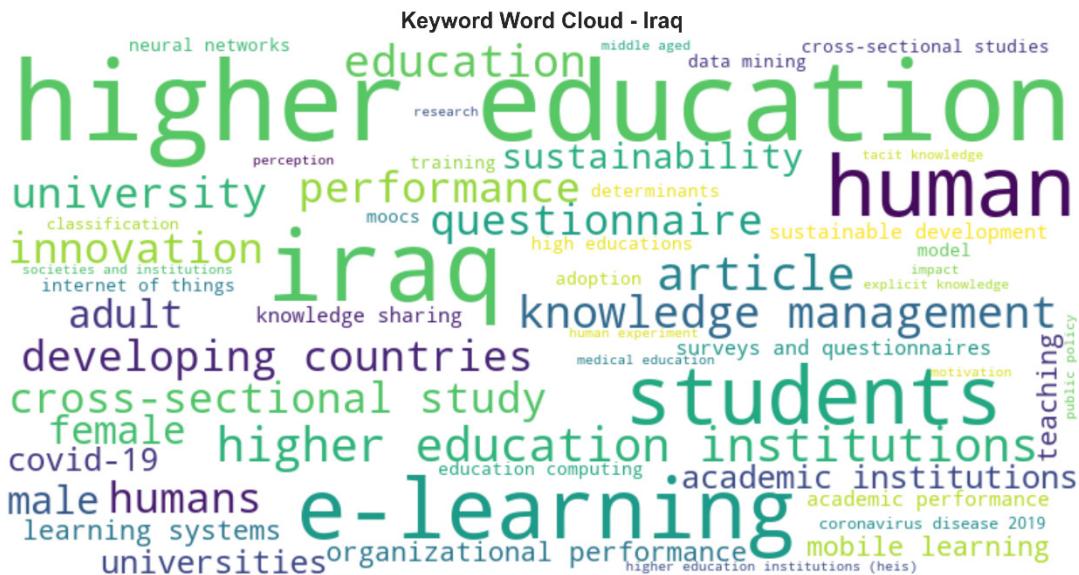
Figure 5: Most impactful topics in the Iraqi research on higher education.

Along with a study of the Iraqi HEIs, it is also important to perform a comparative analysis with other developing countries that have successfully implemented e-learning systems. For this study, we have used a similar query to retrieve data for Iran, Turkey and Saudi Arabia - three neighbouring countries of Iraq. Figure 11 shows that most of the countries, including Iraq, have been contributing to HEI research steadily since the early 2000s, with a notable acceleration in publications after 2005-06. The highest growth can be observed for Saudi Arabia, followed by Turkey, UAE and Jordan. The similar pattern of growth in the publication count in all the countries can be attributed to various common factors that were prevalent in the region.

The rise of publications after 2005-06 could have been due to the end of various socio-political instability in the region. The further rise in the 2013-15 period, particularly in Saudi Arabia and Turkey, might have been the result of various reforms and policies aimed at growing HEIs in the region.[37-39]

The increase in various funding opportunities by the respective governments to emphasise the educational development and research progress in the Gulf nations.

The last decade has provided many collaboration opportunities for the HEIs in the region, both on domestic as well as international levels. Additionally, the government encouraged many global internship opportunities for scholars in the region.

The pandemic era of 2020-22 has a sudden increase in the publication count, as well as citation count. The analysis of Iraq shows a trend of an e-learning paradigm prevalent, which could have also been a factor for the other three nations.

Overall, we can observe that due to many common issues, government policies and global influences, the publication pattern is very similar within all the developing Gulf nations.

From Figure 12, we can observe the publication pattern to be mirrored in the citation patterns as well. With a steady increase
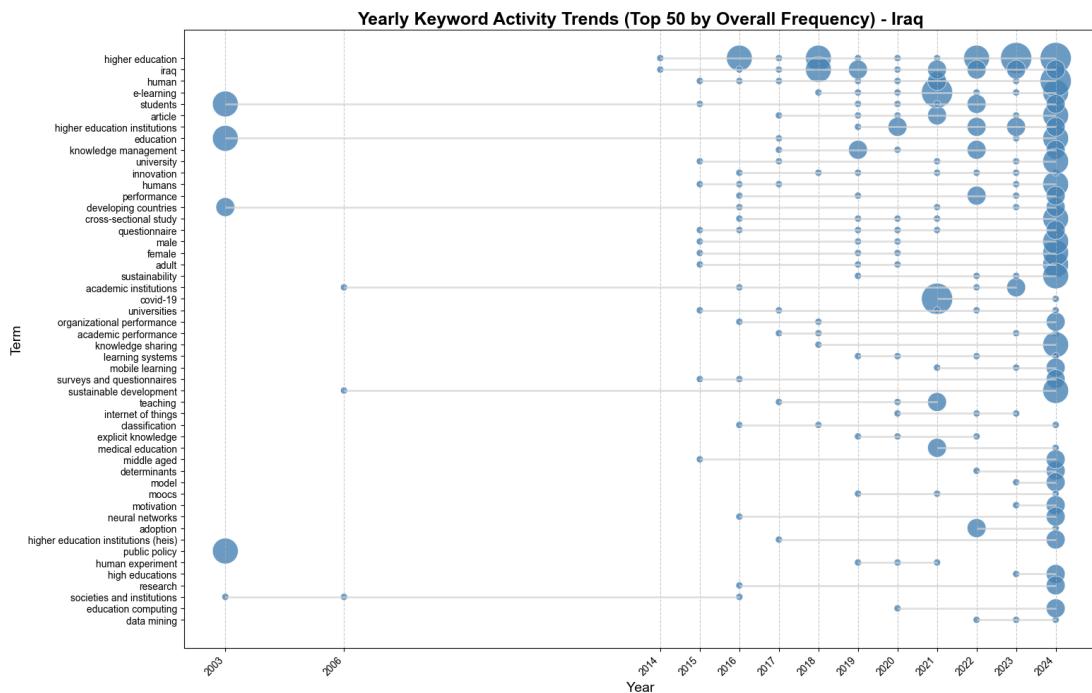
Figure 6: Trends in research themes over the years.
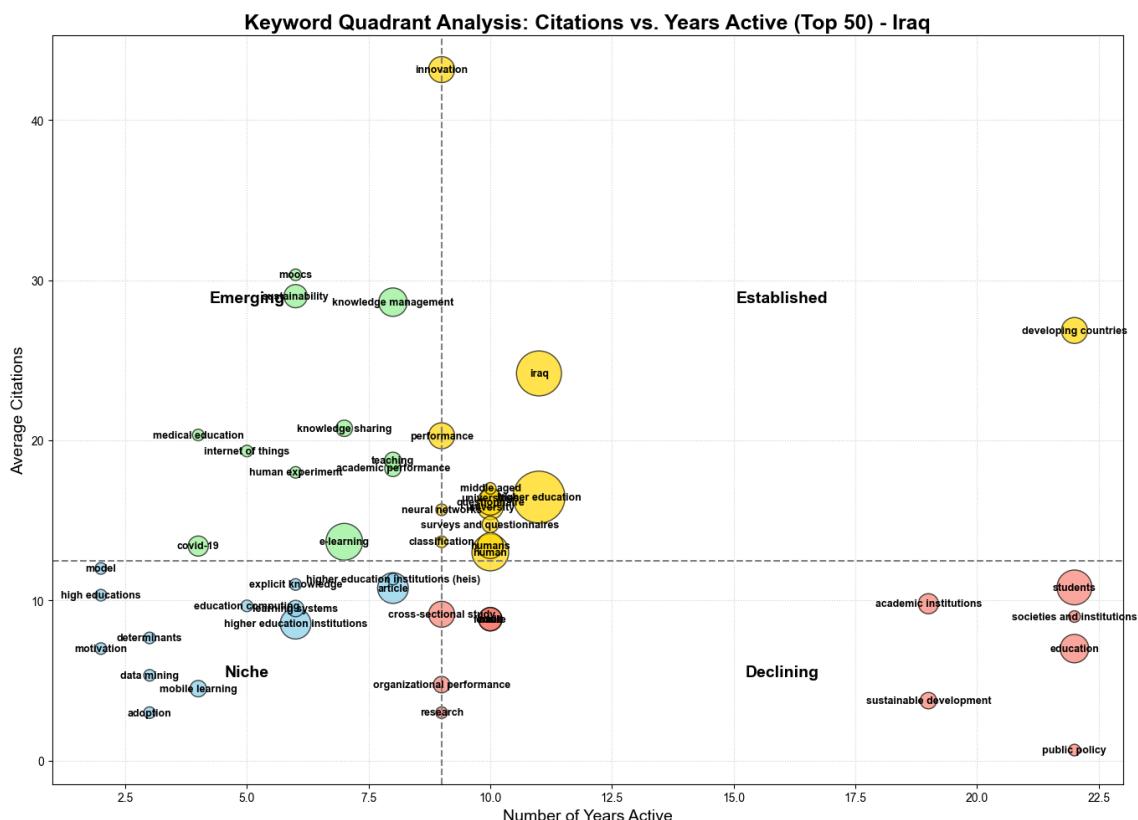
**Figure 7:** Thematic map of research topics in Iraq.

Corresponding Author's Countries
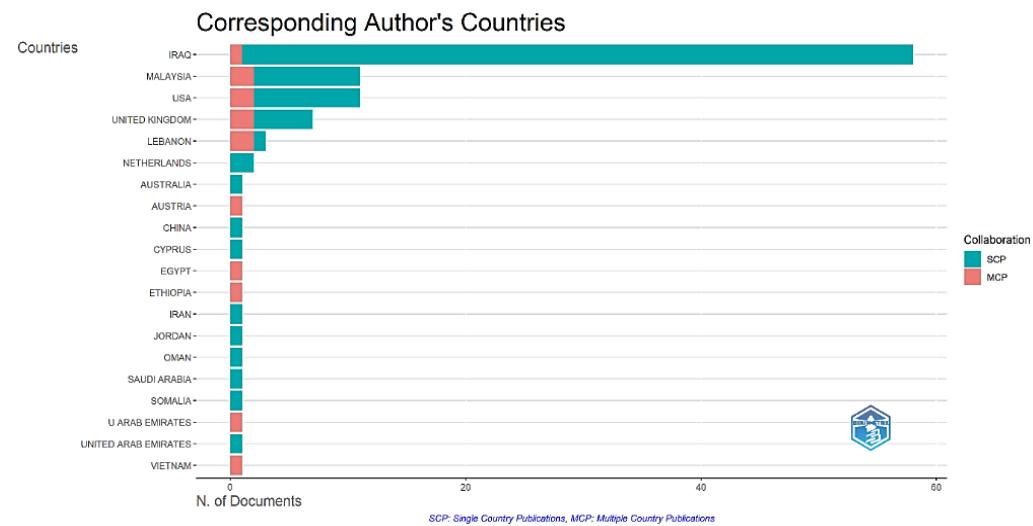
Figure 8: Author types and country of affiliation.

Country Collaboration Map
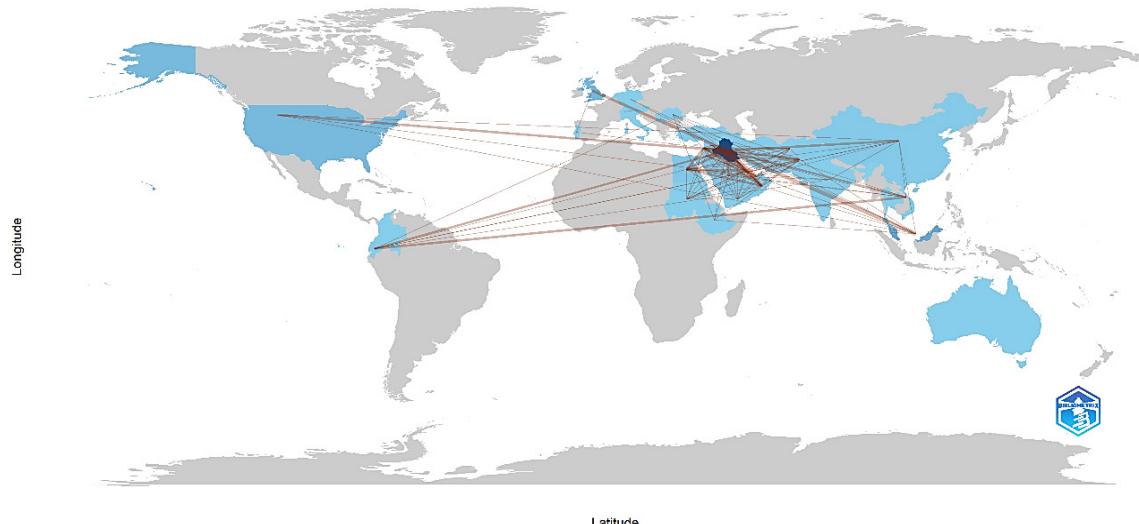
**Figure 9:** Collaborating countries with Iraq based HEIs.
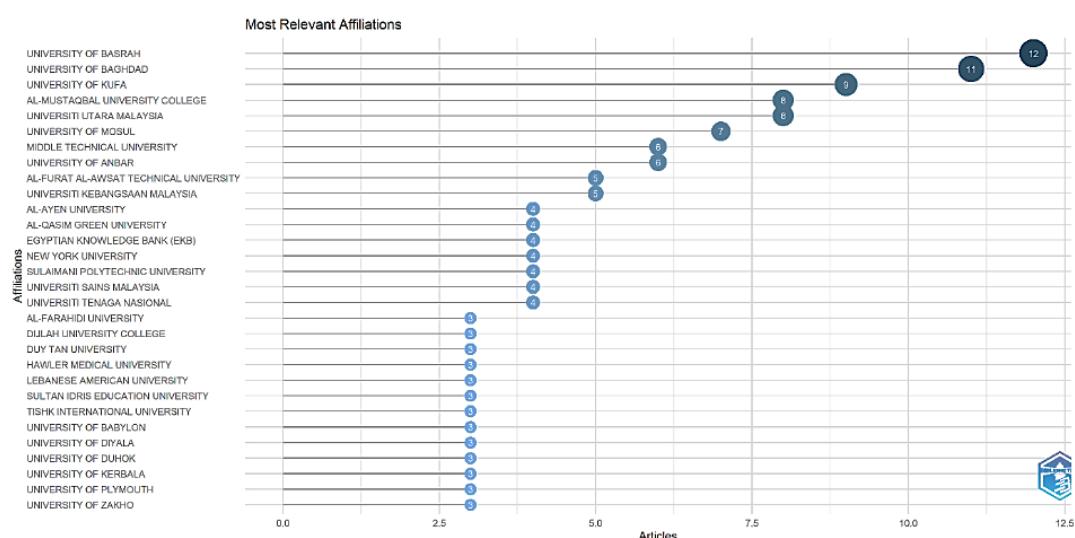

Figure 10: Most active affiliations of Iraq.

Total Publications Over Years by Country
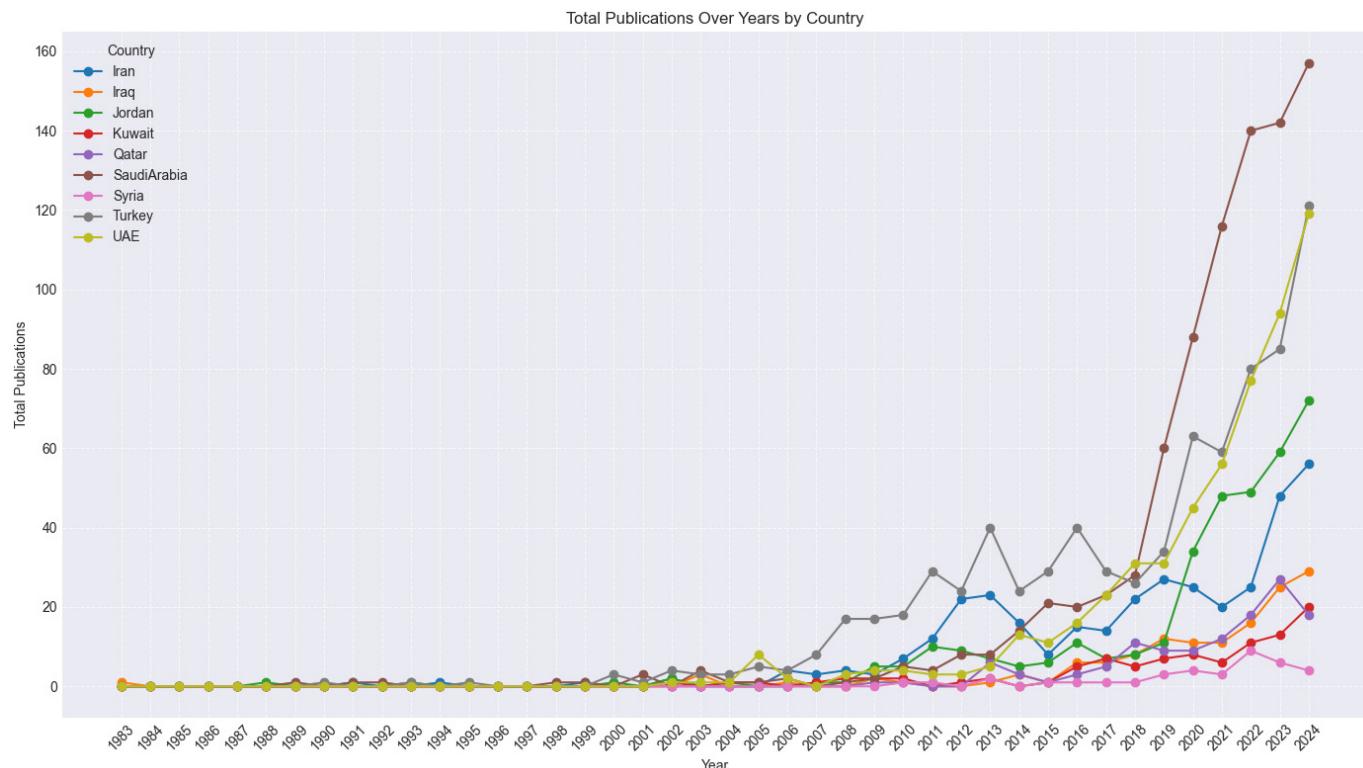
Figure 11: Publications trends of neighbouring countries.

Total Citations Over Years by Country
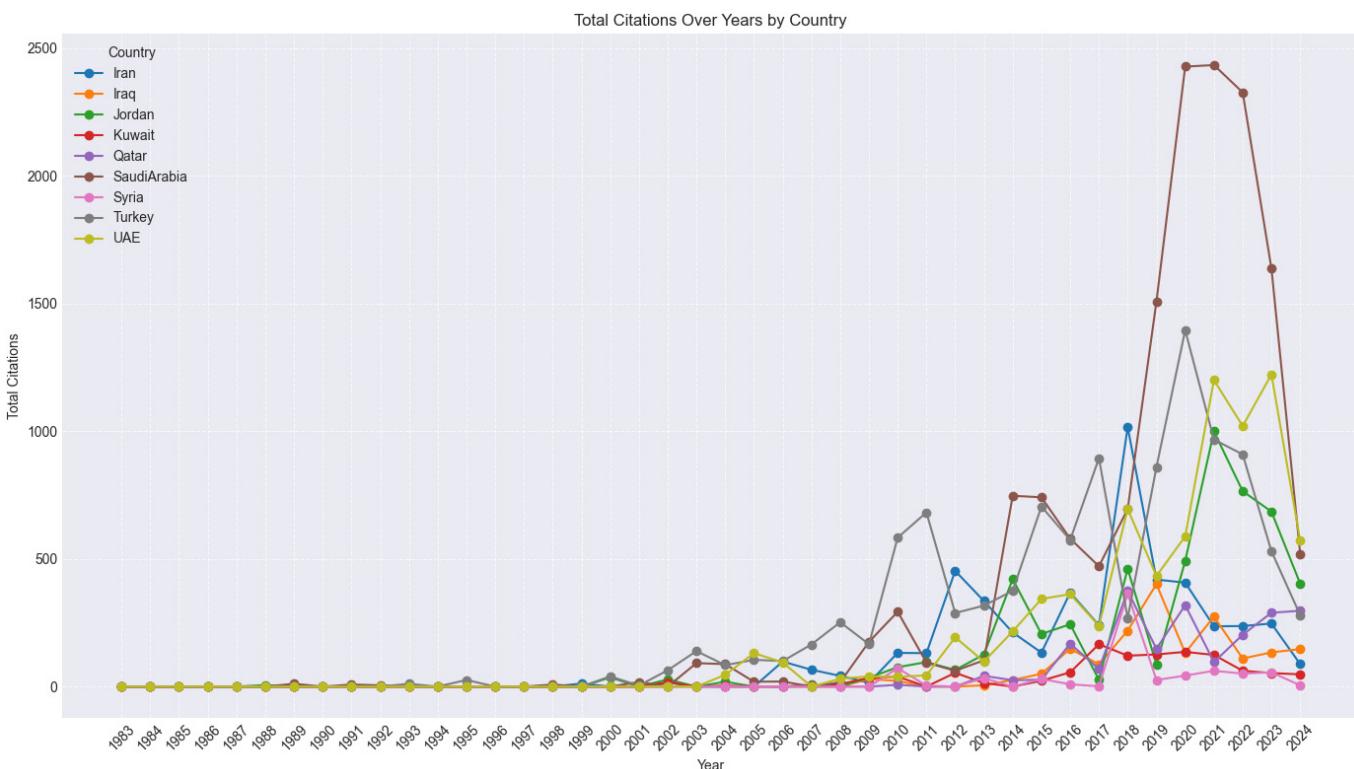
Figure 12: Citation trends of neighbouring countries.

in publication count, these articles that were published from collaborations and recent topics are also heavily cited. There were many citations for publications from 2014-17, coinciding with increased collaborative research in these countries. However, a major increase can be seen in the 2020-22 period, which coincides with the pandemic era and the surge in the online education paradigm. Overall, we can conclude that Iraq has a similar growth of the HEIs and the educational landscape as its neighbouring countries.

Keyword analysis in the study revolves around the research on women's access to higher education. This may suggest a trajectory for gender-related studies and advancements within Iraqi HEIs. Finally, the absence of Iraqi HEIs from the major international rankings requires further analysis of the parameters for the inclusion of HEIs into global rankings.[40,41] This ranking exclusion indicates a significant area for enhancement, typically associated with quality assurance deficiencies and digital transformation preparedness.

Future research may work to enhance research quality, international collaboration, and the emergence of viable funding sources for HEIs.[42] If these shortcomings are improved, Iraqi HEIs can look for new research topics, keep the pace of research progress, and consolidate their position in the international ranking systems, thereby enhancing their global academic competitiveness. Another limitation includes the use of English articles only and not considering the publications in the regional languages. This is a shortcoming that can be linked to the database itself and can be improved upon with extending our options for collecting the publication meta-data. However, only Scopus and Web of Science were selected due to their reliability with the curation process of the data, and exclusion of grey literature. This will require a focused strategy on actionable recommendations such as investing in state-of-the-art research infrastructure, fostering robust international research partnerships, and implementing rigorous quality assurance frameworks aligned with global best practices. Additionally, developing comprehensive strategies for digital transformation in education and research will be paramount for Iraq to bridge the gap with its regional counterparts and improve its standing in global academic societies.

CONCLUSION

The present research aims at examining the Iraqi higher education structure, with a bibliometric analysis of the quality enhancement of education in Iraq. The study spans between 1983 and 2024 and includes publication trends, citation impact, collaborative patterns, and thematic interests. Since 2015, a significant increase in government investments highlights an emerging trend in research-based funding. There has also been progress in the thematic structure of the research landscape from traditional themes to modern issues and improvements in education. The citation analysis also suggests the rise of the

impact of Iraqi research output at the international level. This indicates a rise in the quantitative aspect of the Iraqi HEIs. The analysis of the keywords shows a shift in focus towards higher quality and diversity in educational institutions: institutional performance, knowledge management, the place of women as academics, and more. With an increase in collaboration patterns, the analysis also shows a trend towards both international and domestic collaboration, which is important in developing better research capability in the HEIs.

The research also identifies gaps in Iraq's representation in university rankings such as QS and Times Higher Education. This gap presents an opportunity for future initiatives that are aimed at improving the visibility and competitiveness of Iraqi institutions on the world stage. To address these challenges and enhance the visibility and competitiveness of Iraqi institutions on the world stage, policymakers and academic leaders should consider long-term, targeted investments in higher education infrastructure, fostering international research partnerships, and developing robust quality assurance frameworks. Furthermore, implementing policies that create a consistently favourable climate for research, including stable funding mechanisms and reduced bureaucratic hurdles, is essential. Specific future research is also warranted to further investigate adaptability of key e-learning technologies, challenges in developing comprehensive digital learning paradigms, and strategies for improving women's access and participation in higher education, as well as concrete pathways for Iraqi HEIs' inclusion in global ranking systems.

In conclusion, the Iraqi higher education sector has shown good potential for growth in its face of hardships. Although the country still faces different challenges, the Iraqi HEIs are still enhancing their position in the international academia. Thus, with an intensifying development in the research infrastructure, Iraq has the potential to significantly improve the standing of the country in international academia.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

1. Kramer SN. Schooldays: A Sumerian composition relating to the education of a scribe. Journal of the American Oriental Society. 1949; 69(4). doi: 10.2307/596246.
2. Harb I. Higher education and the future of Iraq. United States Institute of Peace; 2008. Available from: https://www.usip.org/publications/2008/01/higher-education-and-future-iraq.
3. Mikhaylov DV, Mohammed KJ. History of education in Iraq; 2012. Available from: http://www.confcontact.com/2012_10_24/4_Mikhaylov_Karam.htm.
4. Ranjan R, Jain P. The decline of educational system in Iraq; 2009.
5. Issa J, Jamil H. Overview of the education system in contemporary Iraq; 2010. ResearchGate. Available from: https://www.researchgate.net/publication/291276630.
6. Mahmud SF. The higher education in Iraq challenges and recommendations article info. J Adv Soc Res. 2013; 3(9): 255-64.
7. Forum GI. Failing the future: the abysmal condition of higher education in Iraq. Gulf International Forum; 2023. Available from: https://gulfif.org/failing-the-future-the-abysmal-condition-of-higher-education-in-iraq.
8. Makki I. Higher education in Iraq after 2003 ongoing challenges; 2023.

9. Milton SA. The neglected pillar of recovery: A study of higher education in post-war Iraq and Libya. University of York; 2013. Available from: https://books.google.co.in/books?id=t6yJ0AEACAAJ.

10. Palander N. Higher education policy-building in the Kurdistan region of Iraq: perceptions of university representatives. Canada: University of Toronto; 2013.

11. Bornmann L, Stefaner M, de Moya Anegón F, Mutz R. What is the effect of country-specific characteristics on the research performance of scientific institutions? Using multi-level statistical models to rank and map universities and research-focused institutions worldwide. J Informetr. 2014; 8(3): 581-93. doi: 10.1016/j.joi.2014.04.008.

12. Pritchard A. Statistical bibliography or bibliometrics? J Doc. 1968; 25(4): 348-9.

13. Bornmann L, Marx W. How to evaluate individual researchers working in the natural and life sciences meaningfully? A proposal of methods based on percentiles of citations. Scientometrics. 2014; 98(1): 487-509. doi: 10.1007/s11192-013-1161-y.

14. Bornmann L, Mutz R. Growth rates of modern science: A bibliometric analysis based on the number of publications and cited references. J Assoc Inf Sci Technol. 2015; 66(11): 2215-22. doi: 10.1002/asi.23329.

15. Moed HF. New developments in the use of citation analysis in research evaluation. Arch Immunol Ther Exp (Warsz). 2009; 57(1): 13-8. doi: 10.1007/s00005-009-0001-5, PMID 19219533.

16. Moed HF. Measuring contextual citation impact of scientific journals. J Informetr. 2009; 4(3): 265-77.

17. Al KJ. The house of wisdom: how Arabic science saved ancient knowledge and gave us the renaissance. Penguin Books; 2011.

18. Kennedy H. H. Central government and provincial élites in the early'Abbāsid caliphate. Bull Sch Orient Afr Stud. 1981; 44(1): 26-38. doi: 10.1017/S0041977X00104380.

19. Bedan DrS. Higher education in Iraq between the past and the present. J Posit Sch Psychol. 2022; 2022(4): 4718-31.

20. For Higher Education (Högskoleverket) NA. Higher Education in Iraq. 2003.

21. Sassoon J. Iraq's political economy post 2003: from transition to corruption. Int J Contemp Iraqi Stud. 2016; 10(1): 17-33. doi: 10.1386/ijcis.10.1-2.17_1.

22. Usaid. Promoting higher education in Iraq: USAID's HEAD program; 2004. Available from: http://www.usaid.gov/iraq/.

23. Al-Husseini S, Elbeltagi I. Transformational leadership and innovation: a comparison study between Iraq's public and private higher education. Stud Higher Educ. 2016; 41(1): 159-81. doi: 10.1080/03075079.2014.927848.

24. Al-husseini SJ. The impact of leadership style on innovation in Iraq's higher education institutions: the role of knowledge sharing. Plymouth business school theses 2014. Available from: https://pearl.plymouth.ac.uk/pbs-theses/42.

25. Atrushi DS, Woodfield S. The quality of higher education in the Kurdistan Region of Iraq. Br J Middle East Stud. 2018; 45(4): 644-59. doi: 10.1080/13530194.2018.1430537.

26. Times Higher Education. Rankings; 2021. Available from: https://www.timeshighereducation.com/.

27. Shanghai Ranking's academic ranking of world universities methodology; 2023. Available from: https://www.shanghairanking.com/methodology/arwu/2023.

28. Altbach PG. The dilemmas of ranking. Int Higher Educ. 2015;(42). doi: 10.6017/ihe.2006.42.7878.

29. Altbach PG, Salmi J. The road to academic excellence. World Bank; 2011. doi: 10.1596/978-0-8213-8805-1.

30. Zipoli M, Marchionne S, Di DM, De Giorgi F. Innovative Governance Practices in the Higher Education Institutions in Iraq 2 Authors; 2021. Available from: http://www.projectinspire.eu.

31. Al-Saimari IE. The reality of scientific research in Iraqi universities: problems and solutions. 2021. Available from: https://www.alhudamissan.com/index.php/2013-03-05-21-25-16/2013-03-05-21-25-11/5525-2021-08-22-21-09-32.html.

32. Fattah SA, Mousa AH, Mohsen MK, Khalaf SD, Mousa SH. Determinants of e-learning adoption in higher education in Iraq an academics and students' perspective. TELKOMNIKA (telecommunication computing electronics and control). 2022; 20(1): 201-11. Available from: http://telkomnika.uad.ac.id/index.php/TELKOMNIKA/article/view/21550.

33. Abdulazeez DH, Salah RM, Alves GR. A framework for enhancing higher education in the Kurdistan region of Iraq through A dedicated digital education Mooc. J Univ Duhok. 2020; 23(1): 81-93. doi: 10.26682/sjuod.2020.23.1.9.

34. Elameer A, Elameer AS, Idrus RM. Modified khan eLearning framework for the Iraqi higher education. 2010. Available. In:. ResearchGate. Available from: https://www.researchgate.net/publication/228503778.

35. Aria M, Cuccurullo C. bibliometrix: an R-tool for comprehensive science mapping analysis. J Informetr. 2017; 11(4): 959-75. doi: 10.1016/j.joi.2017.08.007.

36. Jawad HH, Hassan Z. Applying UTAUT to Evaluate the Acceptance of Mobile Learning in Higher Education in Iraq; 2015. Available from: http://www.ijsr.net.

37. Nour SS. Overview of knowledge economy in the Arab region. J Knowl Econ. 2015; 6(4): 870-904. doi: 10.1007/s13132-013-0153-8.

38. Hvidt M. The state and the knowledge economy in the Gulf: structural and motivational challenges. Muslim World. 2015; 105(1): 24-45. doi: 10.1111/muwo.12078.

39. Nurunnabi M. Transformation from an oil-based economy to a knowledge-based economy in Saudi Arabia: the direction of Saudi vision 2030. J Knowl Econ. 2017; 8(2): 536-64. doi: 10.1007/s13132-017-0479-8.

40. Kaghed N, Dezaye A. Quality assurance strategies of higher education in Iraq and Kurdistan: A case study. Qual Higher Educ. 2009; 15(1): 71-7. doi: 10.1080/13538320902731286.

41. Öztas A, Özdemir M, Mart CT. Perspectives on quality assurance in higher education in Iraq: A case study at Ishik university. Int J Acad Res Bus Soc Sci. 2017; 7(9): 268-72.

42. Jawad SN, Al-Assaf SI. The higher education system in Iraq and its future. Int J Contemp Iraqi Stud. 2014; 8(1): 55-72. doi: 10.1386/ijcis.8.1.55_1.

APPENDIX A: DATABASE QUERIES

SCOPUS

For the Scopus database, the query used was - (TITLE-ABS-KEY ("Higher Education Institution*" OR "Academic Institution*" OR "Higher Education System" OR "Higher Education Framework*" OR "Institutional Ranking*" OR "Academic Audit" OR "Quality Assurance in Higher Education" OR "National Accreditation System" OR "International University Ranking*" OR "World University Ranking*" OR "Global University Ranking*" OR "Quality Evaluation in Higher Education" OR "HEIs" OR "Higher Educational Ranking Framework") AND (TITLE-ABS-KEY ("Iraq" OR "Iraqi") OR AFFILCOUNTRY ("Iraq"))) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "re"))). This query provided a total of 124 documents.

Web of Science

For the WoS database, the given query was - TS=("Higher Education Institution*" OR "Academic Institution*" OR "Higher Education System" OR "Higher Education Framework*" OR "Institutional Ranking*" OR "Academic Audit" OR "Quality Assurance in Higher Education" OR "National Accreditation System" OR "International University Ranking*" OR "World University Ranking*" OR "Global University Ranking*" OR "Quality Evaluation in Higher Education" OR "HEIs" OR "Higher Educational Ranking Framework"))AND ((TS=("Iraq" OR "Iraqi")) OR (CU=("Iraq"))))AND (DT=("Article" OR "Review")). This query gave 33 documents in total.