Mapping University Knowledge Management: A Bibliometric Analysis

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Abstract: Knowledge management is becoming an increasingly important and popular research topic. Overall, higher education institutions do not have a dedicated knowledge management system, but in recent years there has been an increasing focus on knowledge management in higher education, as higher education institutions need to manage knowledge effectively to meet current educational challenges and needs. Knowledge management in higher education is a set of processes and tools that collect, structure, capture, store and share knowledge in higher education institutions so that it can be used by learners, teachers and managers. The research aims to undertake a comprehensive survey and review of the literature in the field of knowledge management in higher education. It also aims to map and analyse in detail the thematic scope of related research. In doing so, the research will provide an extensive insight into the context of knowledge management in higher education and current research directions. In my analysis, I chose the framework provided by the PRISMA method, as it guides the process from the first step of data collection to the last step of data processing. Using the PRISMA method, a systematic literature review is conducted, the relevant literature on the topic is listed, summarised and analysed. The analysis is based on the search rules predefined by the author, and the Web of Science database was used as a bibliometric data source for sampling the research, to examine publication trends in higher education knowledge management research. The research sample (N = 967) consisted of publications with the terms 'university' and 'knowledge management' in their titles, and after selection, analyses were performed on a sample of 100 items. VOSviewer software was used to support the analysis process and visualize the results. The literature review results in a comprehensive information table summarising and grouping knowledge management research in higher education according to a rule defined by the author. The results of this research provide a starting point for researchers interested in the field, identify research gaps and identify possible further research directions.

Keywords: Higher Education, Knowledge Management, Bibliometric Analysis

1. Introduction

Knowledge management is the process of managing and using knowledge effectively. The management and sharing of knowledge is increasingly seen as a key factor in higher education as it has become essential for its growth (Areekkuzhiyil, 2016). Knowledge management is particularly important in higher education institutions, as research and education are core activities. Knowledge is created through a variety of human activities (Dhamdhere, 2015; Ranjan and Khalil, 2007), which can take different forms (facts, opinions, experiences, models, etc.) (Adhikari, 2010).

Given the knowledge-intensive nature of higher education institutions, the development, existence and proper functioning of a higher education knowledge management system is essential.

During her research, the author surveyed the literature on knowledge management in higher education, aiming to analyse the publications in a quantitative way.

This article sought to shed light on the field of knowledge management in higher education by answering three research questions:

1. What are the prominent research themes in the field of higher education knowledge management?
2. Which countries are at the forefront of publishing articles on higher education knowledge management?
3. Which aspects of the knowledge management process are prominent in terms of publications in higher education?

The author considers this research to be incomplete, as none of the articles we have examined have addressed these three research questions together.

2. Literature Review

In practice, the implementation of knowledge management cannot be successful unless it has the support of all relevant stakeholders in higher education institutions, as well as government regulators. The stakeholders in

higher education institutions - faculty, administrative staff and students - are a community and must play a joint role in the implementation of knowledge management (Kanwal et al, 2019; Hawkins, 2000)

From the perspective of higher education institutions, knowledge management can be explained as a set of practices that help an institution to improve its teaching, research and administrative roles and encourage stakeholders to use and share data and information in decision making (Petrides & Nodine, 2003).

Rivera et al. (2016) proposed a six-factor process that facilitates knowledge creation, storage, transfer and application. Their model consists of: leadership, culture, structure, human resources, information technology and measurement. Furthermore, their study showed that cultural, human and structural aspects play an important role in university knowledge management models.

One of the most important facilitating factors for knowledge management in higher education is leadership behaviour, as leaders have a significant influence on the direction and effectiveness of knowledge management in their organisations (Nam Nguyen & Mohamed, 2011). Leaders can provide conditions that enable participants to implement and develop their transformational skills in order to enrich their own knowledge and access relevant knowledge shared by others (Crawford, Gould & Scott, 2003); and leadership behaviour can nurture knowledge production and validation (Von Krogh, Nonaka & Rechsteiner, 2012).

Fullwood and Rowley (2017) found in their study that knowledge management policies implemented by higher education institutions are either inadequate or unpredictable. However, there has been a recognition of the importance of knowledge management in higher education institutions (Veer-Ramjeawon & Rowley 2020), followed by initiatives to promote and opt for knowledge management in most cases (Iqbal et al. 2018).

3. Methodology of the Literature Research Process

The author has carried out a systematic literature review to explore the literature, which reduces the risk of relevant publications being omitted from the literature analysed.

Petticrew and Roberts (2008) argue that a systematic literature review is a way of generating meaning from significant amounts of information, and a tool that helps to clarify questions about what is and is not being obtained.

Arksey and O'Malley (2005) state that the rapid growth in the field of literature reviews has resulted in a diversity of terminology that shares characteristic bases across different denominations. The authors stress that these approaches, although given different names, agree on certain basic characteristics. These include the collection, evaluation and presentation of research evidence. According to Arksey and O'Malley, despite the diversity of names in the rapidly evolving field of literature reviews, the basic principles of methodology are similar and are linked to the systematic collection and evaluation of available research data.

Based on the structure used by Massaro et al. (2015), Dumay et al. (2015), Ayodele et al. (2018), who have already published a systematic literature review on knowledge management, the author has created his own rules. The approach they use comprises five interrelated stages, these are:

1. Formulation Of The Research Questions
2. Writing The Research Protocol
3. Identifying The Articles To Be Included In The Literature Search
4. Grouping And Coding The Articles
5. Analysis And Discussion Of The Results

The author used a hybrid approach in the literature search, combining the structure used by Massaro et al. (2015), Dumay et al. (2015), Ayodele et al. (2018) with the PRISMA method.

3.1 Formulating the Research Questions

For the purposes of this article, the research questions I formulated in the introduction will guide me. This article is not intended to answer the research questions that follow, but merely to provide a basis for collecting literature and writing the forthcoming publication. These questions are intended to ensure that this literary analysis is accurate and relevant to all aspects of the subject.

The following research questions were formulated for a comprehensive literature review:

Q1: Does a complex knowledge management system tailored to higher education institutions exist today?

Q1a: If so, what are the factors that influence the process of knowledge management in higher education?

Q2: Do higher education institutions have a knowledge management system in place and, if so, what is the nature of the system? If not, what are the reasons for this?

Q3: What are the factors that influence the process of knowledge management in higher education and the construction of the system?

Q4: What factors help and what obstacles hinder the effectiveness of knowledge management in higher education institutions?

3.2 Writing the Research Protocol

Systematic review of the procedure and methods used in a pre-defined, well-defined protocol is essential (Petticrew and Roberts, 2008; Dumay et al., 2015; Ayodele et al., 2018).

For the analysis, the framework provided by the PRISMA method proposed by Moher et al. (2010) was chosen as it guides the process from the first step of data collection to the last step of data processing. PRISMA provides a comprehensive and transparent process, can be applied to any research field and strongly supports the reproducibility of the review (Vu-Ngoc et al., 2018). The methodology used for systematic literature review consists of four basic steps, these are: identification, screening, eligibility and inclusion.

3.3 Identifying the Articles to be Included in the Literature Search

In the previous section, the method I use in my analysis was presented, thus completing the structure (Petticrew and Roberts, 2008; Dumay et al., 2015; Ayodele et al., 2018). This third stage, defined by them, is fully mapped to the PRISMA method process. The figure below shows the data collection and pre-processing steps used. The number of excluded articles is also highlighted at each step.

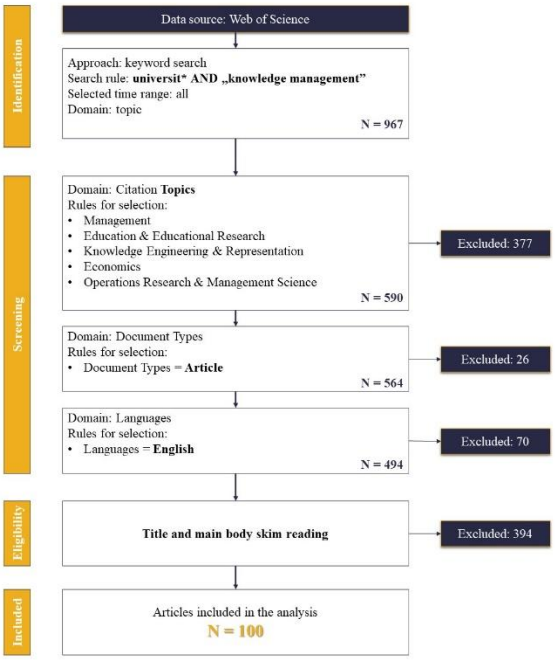

Figure 1: PRISMA flowchart

Source: own edit

The first step in the PRISMA analysis method is identification. The analysis was based on a database provided by Web of Science, where a keyword search was used to identify all relevant literature on the topic. The author searched several databases of scientific articles in order to find a platform for data collection, the Web of Science database was chosen because it is a comprehensive database containing hundreds of thousands of records. The

database was downloaded without any time-frame restriction, so it contains articles from 1995 to the date of download (3 April 2023), which represents a total of 967 scientific publications with content related to knowledge management in higher education. This article does not aim to compare periods and, as it does not include a longitudinal study, it does not have the problem of analysing all the articles published up to the date of download. In order to preserve more information, the database contains data up to the date of extraction, which is why the 2023 truncation year publications are also analysed. With the filters and search rule specified, nearly 1,000 hits were obtained: university* AND "knowledge management".

The next step in the analysis is screening. The analysis was based on a single database, so there was no need to remove duplicate records. The present step of the method can be divided into three stages. In the first stage, the hits were narrowed down to the subject area, discipline classification, selecting those that belonged to the discipline. Thus the following topics were selected: Management; Education & Educational Research; Knowledge Engineering & Representation; Economics; Operations Research & Management Science. This section excluded 377 hits from the analysis. In the second stage, the type of document was identified, and the choice was made for the articles, as the later part of the analysis will require the processing of the relevant literature that follows from the reading of the abstract. With this narrowing down, a further 26 articles were excluded. Finally, in the third stage, the refinement ended on the language aspect of the publications. Only the articles published in English were retained in order to avoid problems in the later stages of the analysis when comparing the results. At this stage, a few articles in French, Russian and German were excluded from the screening and later from the analysis. At the end of the second phase of the PRISMA method, 494 articles remained.

In the next, third stage, a manual reading was carried out to determine eligibility, during which all articles (494) in the downloaded database were read and literature relevant to the research was isolated. In this step, a further 394 studies were excluded because they were not relevant for the following reasons: (1) they mentioned knowledge management but did not examine it from the perspective of higher education institutions, (2) they mentioned knowledge management but the content was not knowledge management specific.

The manual reading is followed by the inclusion step, which consists of keeping the scientific publications that remain in the database after the above steps have been carried out and identifying different sets. The database consists of 100 relevant scientific publications.

After establishing relevance, a fourth stage of the structure (Petticrew-Roberts, 2008; Dumay et al., 2015; Ayodele et al., 2018) follows.

3.4 Grouping and Coding the Articles

The fourth step is to group the different articles received for the structured review. The main purpose of the grouping of articles is to facilitate the effective application of the systematic methodology, thus helping to produce a structured review. This grouping will make it easier to extract relevant information from the literature reviewed. The structured grouping allows a systematic overview and comparison of the literature, allowing it to be analysed from different perspectives. All this will help to define the research framework for future research and to formulate research questions and hypotheses.

Dumay et al. (2015) and Ayodele et al. (2018) use the same grouping and coding principles, however the groupings are developed according to the author's own preferences in order to best serve the structured processing of the literature. The relevant literature has been organised according to the grouping principle presented in the figure below.

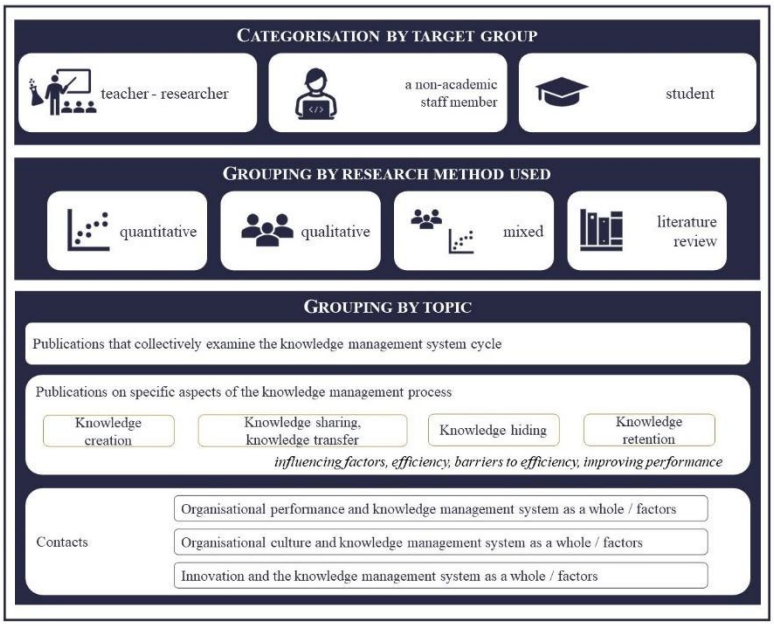

Figure 2: Grouping of reviewed articles

Source: own edit

In the literature review, the articles can be divided into teaching/research, non-academic staff and students according to the target group of the research. I choose this grouping for my research. The group of academics/researchers includes all employees who are closely involved in the teaching of students or who are involved in research activities that contribute to the development and innovation of their field. The next unit in the grouping I have defined is the non-academic staff, who do not carry out teaching and research activities but who provide and promote the University's activities. Finally, the third group is made up of full-time, part-time, undergraduate, masters and doctoral students.

In terms of the methodology used by the authors in their scientific publications, a distinction can be made between literature review, qualitative, quantitative, qualitative and quantitative research and data analysis methods. When grouped by topic, a distinction can be made between research that examines the entire knowledge management cycle as a whole, research that examines individual aspects of the cycle separately, and research that relates individual elements of the knowledge management system to other research areas.

4. Literature Research Results

During the literature search described above - prior to the manual reading - and after the final selection, I also carried out a quantitative analysis of the available data set. VOSviewer software supported the analysis process and visualization of the results. The analysis focused on 494 scientific publications before the manual reading and 100 scientific publications afterwards.

First, I examined the keywords indicated by the abstract of the publications. For a total of 494 items, the top 10 most frequently indicated keywords are "knowledge management" (n=286), followed by "innovation" (n=99), "performance" (n=92), "impact" (n=73), "universities" (n=57), "knowledge sharing" (n=52), "management" (n=55), "model" (n=47), "university" (n=42), "systems" (n=38). The figure below illustrates the keywords by network visualization with the exception of the keyword "knowlegde management" (its appearance distorted the network, suppressing the other keywords due to the size of the element count).

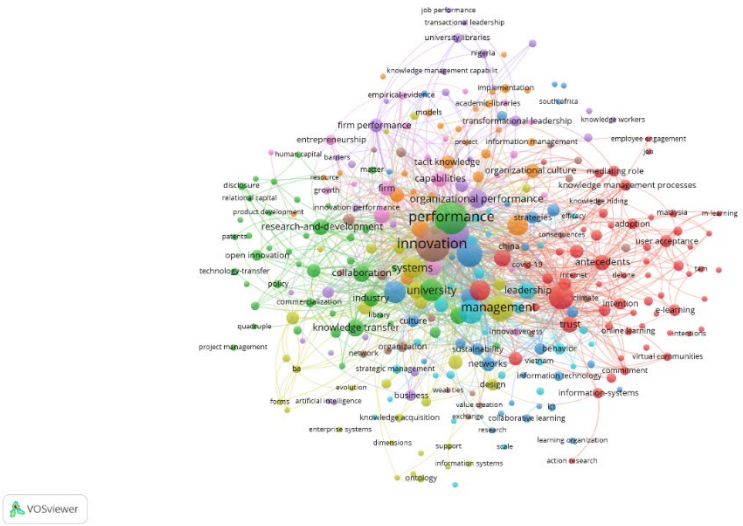

Figure 3: Cooccurrence of keywords in publications on knowledge management in higher education

Source: based on downloaded database, own editing

The keywords that were most frequently mentioned after manual reading were "knowledge management" (n=52), "knowledge sharing" (n=22), "innovation" (n=22), "performance" (n=21), "model" (n=15), "impact" (n=18), "management" (n=15), "antecedents" (n=12), "trust" (n=10), "universities" (n=18). The figure below illustrates the occurrence of keywords in the database filtered by network visualisation after manual reading. The keyword "knowlegde management" was excluded from the visualisation to avoid bias.

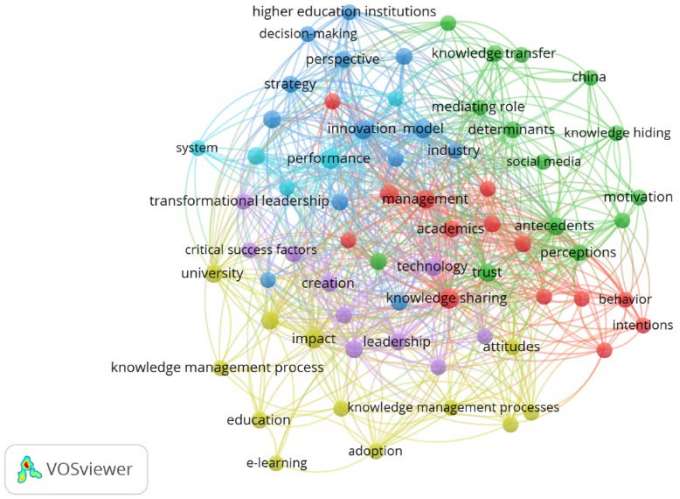

Figure 4: Cooccurrence of keywords in selected publications on knowledge management in higher education

Source: based on downloaded database, own editing

The network shows peaks in different colours. The colours represent the cluster classifications, so that vertices with the same colour belong to a cluster, connected by edges with the same colour. There is a high co-occurrence rate between keywords belonging to the same cluster. The size of the vertices represents the number of co-occurrences, while the thickness of the edges connecting the two vertices represents the frequency of co-occurrences.

From the two visualisations, it can be seen that the number of keywords has been reduced after the manual reading, with "innovation" and "performance" retaining their magnitude, but "knowledge sharing" being promoted. Knowledge hiding" (n=3), "knowledge transfer" (n=5), "knowledge creation" (n=8) and "trust" (n=10) were added to the map.

Quantitative literature analysis shows that knowledge creation, knowledge sharing, knowledge transfer and knowledge hiding are areas that have been researched in academic publications on knowledge management in higher education, but which have further research potential.

Quantitative approaches are also interesting for countries researching this topic. In the visualisation, countries where at least 3 publications have been published are indicated.

The following figures, first before and then after the manual reading, show a grid of countries contributing to knowledge management in higher education (peaks represent countries, edges represent the number of citations), with a reference focus. The figures below follow a gravity arrangement, i.e. whichever country has the most referral links is central in the middle, while those with few (or no) links are on the periphery. The following graph does not show isolated peaks, i.e. countries that are not connected to other countries.

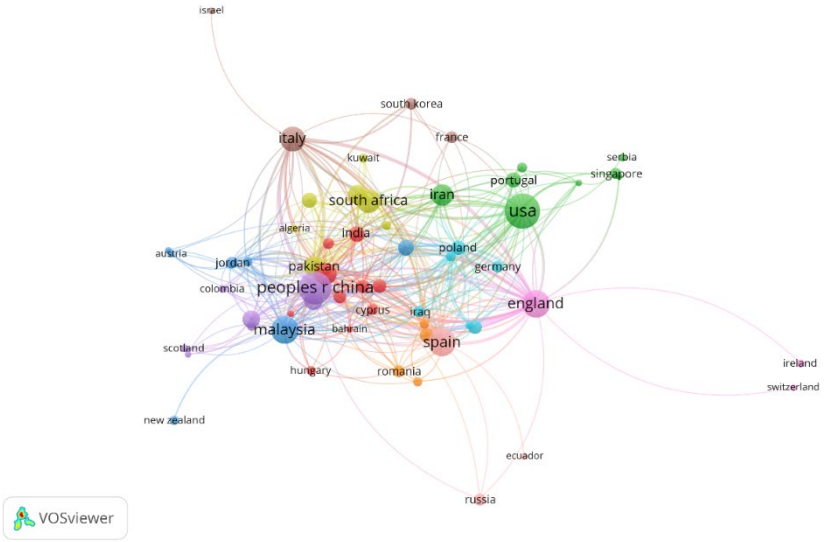

Figure 5: Network of countries publishing on knowledge management in higher education

Source: based on downloaded database, own editing

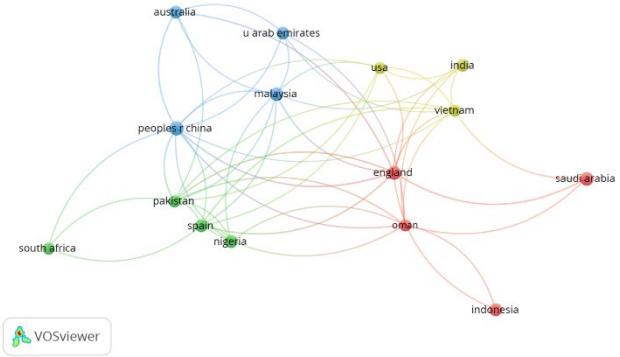

Figure 6: Network of countries publishing on knowledge management in higher education - after selection

Source: based on downloaded database, own editing

After manual reading, it can be said that, apart from China and England, knowledge management in higher education is the most researched area among researchers from Asian and African countries. It is important to note that among the European countries, only Spain is on the map. From the above, it can be concluded that, apart from Spain, there is no international literature on European institutions. It is important to note, however, that this indicates the country under which the researcher is publishing and not the country of higher education system studied.

Based on international publications, it can be concluded that, as a less researched area in our region, there is a great research potential for research on knowledge management systems in Hungarian higher education institutions.

5. Discussion

Knowledge management in higher education is increasingly coming under the spotlight as universities and research institutions recognise the importance of managing and sharing knowledge effectively. The results of

my research have led to several interesting and relevant conclusions that contribute to the academic discourse in this area.

5.1 Prominent Research Topics

Based on the analysis, the most prominent research topics in the field of knowledge management in higher education include general knowledge management, innovation, performance, knowledge sharing, and trust and knowledge hiding. The dominance of the keyword "knowledge management" in the publications is understandable, as it is the most general term, encompassing the whole cycle. At the same time, the prominence of innovation and performance suggests that researchers have a strong interest in investigating the effectiveness and efficiency of knowledge management systems.

Particularly noteworthy is the role of knowledge sharing and knowledge capture, which directly influence knowledge flows in institutions. And trust, as an increasingly prominent factor, also plays a key role in effective knowledge management processes. These findings suggest that future research should explore these factors in more depth, with a particular focus on their interactions and effects.

5.2 Leading Countries in Knowledge Management Research

The spatial distribution of publications also yielded interesting observations. The dominance of China and the UK alongside Asian and African countries suggests that there is a strong research activity in these regions in the field of higher education knowledge management. The presence of Spain as the only European country among the publications examined indicates that the European research community is less active in this field or less present in the international publication space.

This observation may have important implications for higher education institutions in Hungary. The data show that there is significant research potential in the study of knowledge management systems in Hungarian universities, which could contribute to the international academic discourse and increase the academic visibility of the region.

5.3 Outstanding Factors in the Knowledge Management System Process

Knowledge sharing, knowledge creation, knowledge hiding and trust play a key role in the study of knowledge management system processes. These factors have a significant impact on the effective flow and use of knowledge in educational institutions. The research results clearly show that these processes are closely interrelated and that the effectiveness of knowledge sharing is highly dependent on the level of trust within the organisation.

These factors may be of particular relevance for higher education institutions in Hungary, where the development of knowledge management systems can contribute to improving the effectiveness of teaching and research. The frequent occurrence of the keywords innovation and performance suggests that the development of knowledge management systems can directly contribute to the competitiveness and innovative capacity of institutions.

6. Conclusion

In conclusion, the results of the research highlight that knowledge management in higher education is a dynamically developing field of research, which offers many opportunities for future research. Innovation, performance, knowledge sharing and trust are key elements to be further explored in order to improve knowledge management systems. In particular in Hungary and the region, there is great research potential in this area, which can contribute to the development and international visibility of universities and research institutions.

7. Further Research Opportunities

The findings of this research have identified a number of further research directions and opportunities in the field of knowledge management in higher education. In what follows, I highlight two potential research topics that I believe hold great potential for future research. Firstly, I will highlight the motivations and consequences of knowledge hiding as a further research direction, which aims to assess why knowledge is hidden by lecturers, researchers and students and what impact this has on organisational performance. A further research option is

to investigate the effectiveness of knowledge sharing strategies, with the aim of examining the effectiveness of different knowledge sharing strategies in higher education institutions.

8. Research Limits

The present research has fundamental limitations, as only article-type documents were included in the database. Conference papers excluded by the rule would be relevant and relevant because their results appear faster than the publication process of journal articles. However, this study focused only on high-ranking scientific publications.

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