



Bibliometric Analysis: Mapping the Role of Intellectual Capital in Enhancing Excellence Competing Colleges

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Abstract: *In the knowledge economy, competitive advantage in Higher Education (HE) is based on intangible assets of Intellectual capital such as quality in teaching, research, innovation, image, reputation and stakeholder relations. Several studies have been conducted to analyze how intellectual capital contributes to competitive advantage in different contexts. However, it is still rare in the higher education sector. This study aims to fill this gap by providing knowledge mapping and evaluating articles, the role of intellectual capital contribution to competitive advantage in higher education. This study was conducted through a literature study using a bibliometric meta-analysis method approach. This study analyzed 13 publications taken from the Google Scholar database. The results of the study propose the development of variables that are able to improve the relationship between the role of intellectual capital contribution to competitive advantage in higher education comprehensively. The fields of leadership style, innovation and university performance are often associated with the context of university competitive advantage.*

Introduction

The implementation of vision and mission activities in Higher Education (HE) requires the use of a series of tangible or intangible assets. Knowledge is one of the intangible assets reflected through intellectual capital. Alserhan, 2017b argues that, in a knowledge-based economy, intellectual capital is a key element in creating competitive advantage for organizations (Liu, 2017; Lu et al., 2021) . When an organization can assess intellectual capital well, it is better able to achieve its goals and make decisions related to reengineering its programs, which ultimately become more efficient, profitable and competitive, either through product or service quality, cost and price, or other superiority strategies. This study explores the role of intellectual capital in enhancing the competitive advantage of higher education institutions, focusing on how intangible assets contribute to the long-term success of universities in a competitive landscape.

In the era of knowledge-based economies, intellectual capital plays a crucial role in determining the competitive edge of organizations, including higher education institutions. Understanding this relationship is essential for enhancing institutional excellence. Abdelshman et al., (2014) argue that tangible assets, such as buildings, sports fields, and equipment, will always create value in an industry, but most of it comes from customers who are willing to pay in the form of intellectual capital. There are three dimensions of intellectual capital, namely human capital, such as knowledge; relational capital, such as partnerships with stakeholders; and structural capital, such as information and communication systems (Astuti et al., 2019). Human capital is understood as a set of knowledge, skills, and experiences that cannot be separated from their owners, and are the main drivers of organizational performance and value creation for the company (Farsani et al., 2012) . Structural capital refers to intangible resources and activities that enable knowledge to be formalized and maintained in an organization, such as culture, structure, processes, intellectual property, and information systems (Jayabalan et al., 2021; Secundo et al., 2015; Vakhrushina & Vakhrushina, 2022). Furthermore, relational capital refers to the ability to absorb, exploit, and explore new knowledge from the environment to obtain and maintain a position of competitive advantage, such as image or reputation (Abdelshman et al., 2014; Alserhan, 2017b; Astuti et al., 2019).

Universities today operate in a highly competitive environment. This is characterized by demands from various stakeholders, such as the adequate use of public resources and the adoption of new paradigms in scientific publications between industry and academia (Veltri et al., 2014) . Considering that the management of intellectual capital in universities is based on the fact that the production and dissemination of knowledge can contribute to its competitive advantage (Galleguillos-Cortés et al., 2018), competitive advantage in universities can be provided through image, brand, knowledge transfer and efficiency in operations (Hu et al., 2019) ; service quality and student satisfaction (Panda et al., 2019) and the social responsibility of the university (El-Kassar et al., 2019).

Thus, assessing which assets are important for Higher Education, the capacity of resources that always adapt quickly to market opportunities and demands (Mahdi, Nassar, & Almsafir, 2019), then this process becomes a key factor in creating competitive advantage in higher education (Britto et al, 2019). Based on this, the purpose of this study is to analyze and compare the development of academic production on the contribution of intellectual capital to competitive advantage in higher education. Therefore, higher education must identify the factors that influence its competitiveness.

To achieve competitiveness in the global education market, higher education institutions need a transformation in the management approach at the national and institutional levels by including aspects of marketing, branding, modernization of the educational process, internationalization of research, improvement of physical infrastructure and organization of recreational spaces especially for international classes (Kholmuminov et al., 2019). The above elements are intangible assets of intellectual capital. It is important to identify the relationship between intellectual capital and its contribution to competitive advantage by analyzing the content of scientific works in the form of publications.

Several previous studies have been conducted to analyze how intellectual capital contributes to competitive advantage in different contexts. These contexts include SMEs (Jokhu & Rokhim, 2021); technology-based companies (Darman et al., 2024) and the public sector (Zahroh et al., 2024). However, there are several obstacles to analyzing the relationship between intellectual capital and competitive advantage in higher education (de Matos Pedro et al., 2020; Tjahjadi et al., 2019). Intellectual capital in higher education is considered a complex system (Akpinar & Ozer-Caylan, 2021). This system involves a large number of intangible assets, stakeholders, policies, and planning strategies in higher education (Barforoush et al., 2020). This behavior limits the identification, measurement, evaluation, and decision-making of intangible knowledge assets in higher education (Jonkers & Eftekhari Shahroudi, 2021).

Previous studies have explored intellectual capital in various sectors, such as SMEs (Jardon & Martos, 2014) and technology-based companies (Bueno et al., 2016). However, there is limited research in the higher education sector, particularly in developing countries. This study aims to fill this gap by providing a knowledge overview on how to define intellectual capital and learn how to turn it into an advantage or develop strategic competitive features. It is imperative for organizations to see the intellectual capital, skills, and creative ideas inherent in human resources and innovation so that they can invest in them to extract the highest value through development in achieving competitive advantage amidst economic uncertainty and increasingly difficult economic conditions. This study contributes by providing a comprehensive bibliometric analysis, mapping the role of intellectual capital in enhancing competitive advantage in higher education institutions, and proposing future research directions. While previous studies have focused on other sectors, this study uniquely addresses the gap in understanding the role of intellectual capital within higher education, particularly its contribution to institutional competitiveness.

The introduction section describes the background of the research problem including the existing literature about research problem (gap of literature), objectives of the study, research contribution and structure of article sections at the end of the introduction. Authors are also required to explicitly write a statement of originality (novelty), for example " Previous research have generally focused on, however research that attempts to investigate the issue of ... is still limited especially in the context of ... therefore , the purpose of this research is to ... "(example of statement novelty) .

Research Method

This study adopts the form of bibliometric analysis research (Hudha et al., 2020) Bibliometric analysis in study This used For map development of research topics on the role of intellectual capital in increasing the competitive advantage of universities. Over the past 13 (thirteen) years, research on the role of intellectual capital in increasing the competitiveness of universities has been very limited. In order to map the development of research, bibliometric analysis is needed. Bibliometric analysis is intended to determine the development of research publications in the period 2010-2023, to determine the direction of scientific concepts, and to determine the network of intellectual capital strategies and university competitiveness based on keywords (Co-occurrence).

The first step is to identify the article using source data from Google Scholar indexer and Scopus Database with the help of Publish software or Pheris (PoP). Next, the identification of the keywords "Intellectual Capital" AND "Competitive Advantage" AND "Universities" was carried out and the results of the search results were narrowed down by identifying articles related to the topics discussed and carried out.

"Intellectual Capital" AND "Competitive Advantage" AND "Universities" [title] from 2010 to 2023

Publish or Perish 8.8.4384.8527 (basic report)

WinPosix (x64) edition, running on WinPosix 10.0.19045 (x64)

Search terms

Title words: "Intellectual Capital" AND "Competitive Advantage" AND "Universities"

Years: 2010 to 2023

Other options: include citations; include patents

Data retrieval

Data source: Google Scholar

Search date: 2023-06-18 06:30:30 +00800

Cache date: 2023-06-18 06:30:46 +00800

Search result: [0] No error

Important: This data source provides only abbreviated data. Any ellipses (... marks) shown in this report originate with the data source; they are NOT caused by subsequent processing in Publish or Perish.

Metrics

Reference date: 2023-06-18 06:30:46 +00800

Publication years: 2014-2021

Citation years: 9 (2014-2023)

Papers: 14

Citations: 151

Citations/year: 16.78 (acc1=6, acc2=2, acc5=1, acc10=1, acc20=0)

Citations/paper: 10.79

Authors/paper: 1.71/1.0/1 (mean/median/mode)

Age-weighted citation rate: 27.14 (sqrt=5.21), 21.94/author

Hirsch h-index: 5 (a=6.04, m=0.56, 138 cites=91.4% coverage)

Eghe g-index: 12 (g/h=2.40, 151 cites=100.0% coverage)

PoP hI,norm: 3

PoP hI,annual: 0.33

Fassin hA-index: 2

Figure 1.

Search method via Publish or Perish

Source: Publish or Perish (2023)

The dataset is stored in the RIS (Research Information Systems) type after using the Publish or Perish metadata and managed by the Mendeley reference application , then the dataset is analyzed using the Vosviewer application by selecting ' create a map based on text data '. The method used to calculate the dataset is full counting with the aim of calculating as is according to researchers who have taken the topic of intellectual capital in increasing the competitiveness of higher education in their research .

The next step after the data is obtained and stored in the form of a RIS file or Research Information Systems Citation File , is to enter the file into the Vosviewer software with the aim of visualizing network patterns or relationships between bibliometrics into three categories, including network visualization, Overlay visualization, and density visualization. Network visualization aims to visualize the strength or weakness of the network or relationship between

research terms, Overlay visualization aims to visualize historical traces based on the year the research was published, while density visualization aims to display density or emphasis on research groups.

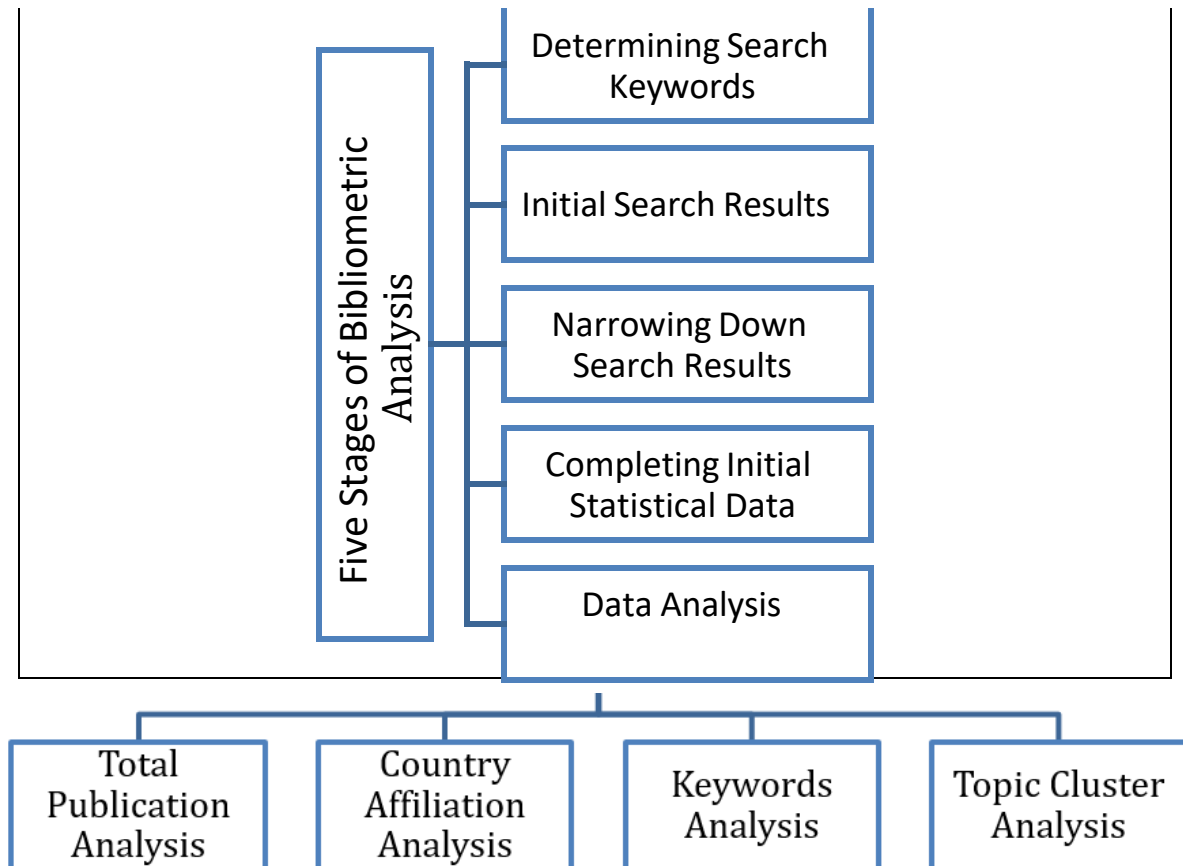


Figure 2. Five Stages of Bibliometric Analysis
 Source: Hudha et al., (2020)

Based on Figure 1, the bibliometric analysis that will be carried out in this study is by analyzing the total publications, country affiliations, keywords, and also research topic clusters.

RESULTS AND DISCUSSION

The bibliometric analysis in this study provides critical insights into the research trends and gaps in intellectual capital within higher education. It identifies key themes and emerging areas that warrant further investigation. As this study adopts a bibliometric analysis model, the results of a systematic literature review are presented. This study successfully found 14 articles each on the Google Scholar and Scopus indexers with the keywords "Intellectual Capital" AND "Competitive Advantage" AND "Universities" starting from the period 2010 to 2023.

Based on the screening criteria that the title of the article must be relevant to the topic of

the role of intellectual capital in increasing the competitive advantage of higher education , it was found that no articles were excluded. Furthermore, based on the integrity of the article, 1 article is included in the literature study, so the remaining articles become 13 articles selected to be included in the study.

1. Total Publication Analysis

Google Scholar database , the process of filtering articles related to the research topic of intellectual capital and competitive advantage in the context of higher education . It can be seen in Figure 3 that the number of publications has experienced a fluctuating trend. Then the highest peak of publications on the topic of intellectual capital on competitive advantage in the context of higher education , occurred in 2017 with a total of 4 articles.

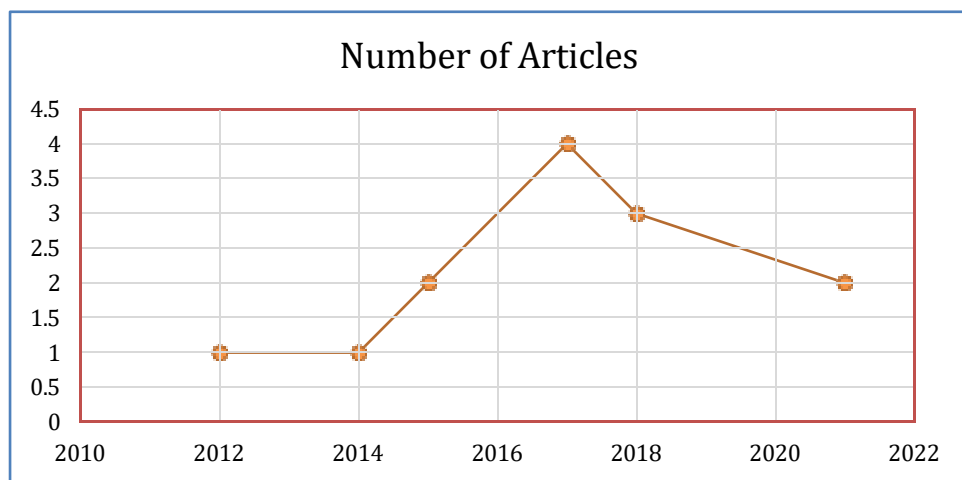


Figure 3.
Number of Articles on Partnership and Competitive Advantage of Higher Education Institutions
Based on Publication Year 2010-2023
Source: Data Processed by the Author, 2023.

2. Country Affiliation Analysis.

Google Scholar database results through the process of filtering articles on the topic of intellectual capital and competitive advantage research in the context of higher education , there are a total of 9 countries of authors identified . The most significant contributions to research on the topic are from Jordan, Indonesia, Iraq and Malaysia with 2 studies . Then research on this topic was also conducted by the countries of Kenya, Poland, Iran, Romania and Turkey each with 1 study . Based on the data above, it can be stated that Jordan, Malaysia, Iraq and Indonesia are countries that are concerned with the research topic of the role of intellectual capital in higher education in increasing competitiveness.

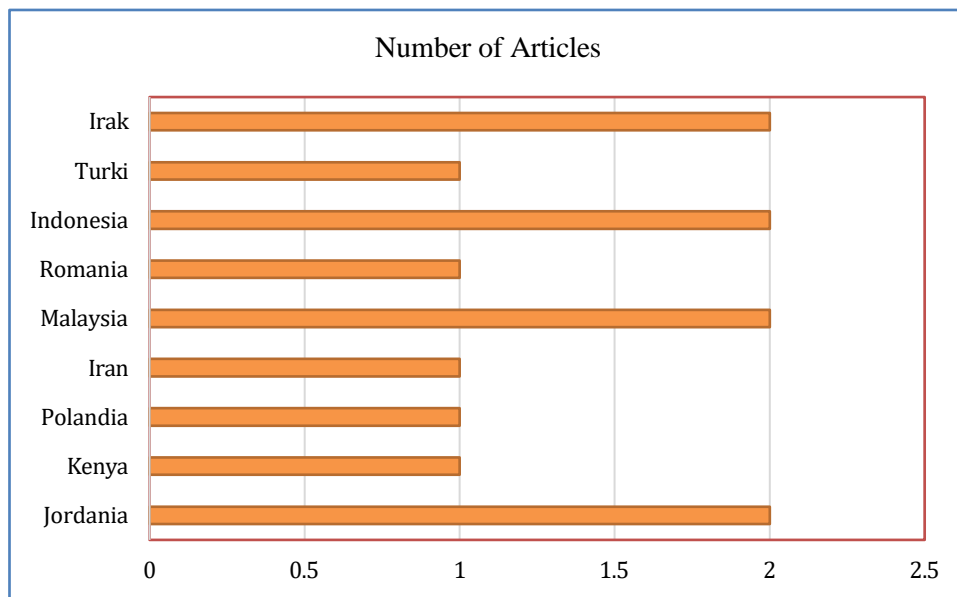


Figure 4

Number of Articles on Intellectual Capital and Competitive Advantage of Higher Education Institutions Based on Country of Affiliation

Source: Data Processed by Author, 2023

3. Keyword Analysis

Mapping results with keywords in articles using VOSviewer. Then the filtering process is carried out again with minimum five occurrences in the database from Google Scholar Scopus that have been filtered previously. The results of grouping using VOSviewer, obtained the most popular and most frequently appearing keywords are leader, knowledge management intellectual capital management and university performance.

4. Cluster Analysis

Bibliometric analysis is carried out by creating visualizations in the form of Network , Overlay, and Density aims to find out the bibliometric network between articles or online publications from downloaded metadata. The bibliometric network consists of on the node in the form of a circle or circle that represents the keyword, while the edge or network nodes represent the relationship between pairs of nodes. Mapping and Clustering in bibliometric analysis through Vosviewer software are complementary, meaning they complement each other. This mapping can be used to obtain a detailed picture of the structure of a bibliometric network. The clusters of each topic are distinguished by the color of each keyword in the network. The results of the topic cluster with VOSviewer obtained 2 clusters with red (first cluster) and green (second cluster). The first cluster contains 3 keywords, the second cluster contains 1 keyword.



Figure 5

Network Visualization Overlay on Co-occurrence of Keyword Articles Related to Intellectual Capital and Competitive Advantage in Higher Education

Source: Data Processed by Author, 2023

The first cluster illustrates that the use of intellectual capital in improving the competitiveness of higher education is closely related to the theme of knowledge management. This study successfully identified various obstacles and supporters related to intellectual capital and knowledge management and identified areas that need to be developed by universities to improve competitive advantage in the future (Abu-Rumman, 2018). The next theme is the application of intellectual capital strategies. The results of the study recommend the importance of implementing intellectual capital strategies as the main and strategic resources for universities as real wealth that guarantees the university's ability to adapt to achieve competitive advantage (Ahmadi et al., 2012; Alfarrar, 2018; Ali, 2018; Alserhan, 2017a; Fazlagic & Skikiewicz, 2014; Harry; & Hidayah, 2021; Nyenze, 2017; Qassas; & Areiqat, 2021; Sadalia et al., 2017; Vătămănescu; et al., 2015). In addition to the aspects of knowledge management and intellectual capital management, the next theme that was successfully identified was university performance. That the consequences of the relationship between intellectual capital and competitive advantage have an impact on university performance. Competitive advantage in this context becomes a variable between intellectual capital and university performance (Anggraini, 2017).

Cluster is the leadership cluster which illustrates that the use of intellectual capital in increasing the competitiveness of universities is closely related to the theme of the role of leadership. Previous research results have succeeded in proving that the role of human capital as one dimension of intellectual capital is a variable between leadership style strategies and university competitive advantages (Jabbouri & Zahari, 2017).

After identifying the mapping and clustering of the field of intellectual capital's role in improving university competitiveness using network visualization, the next step is to cluster the trend of intellectual capital research in improving university competitiveness based on historical traces or years of research publication. Information obtained from the results of Overlay visualization can be used as a reference to identify and detect the state of the art of research in the field of the role of intellectual capital in improving university competitiveness conducted in the period 2010-2023.

Overlay visualization show that the research topics revolve around the role of intellectual capital in improving university competitiveness was widely conducted in the period 2012-2021. Therefore, before 2012, research on this topic was still minimal. So it can be stated that research on intellectual capital in improving university competitiveness is still rarely done at this time. Regarding this fact, this study can help to deepen and develop research on the topic of the role of intellectual capital in improving university competitiveness.



Figure 6

Network Visualization Density visualization on Co-occurrence
Intellectual Capital and Competitive Advantage in Higher Education

Source: Data Processed by Author, 2023

Next is the bibliometric analysis using density visualization. From the visualization results shown in Figure 6, it can be identified that there are dense areas or areas with high density at one node with another node. The level of saturation identified in the number of keywords marked in yellow means that the area is a topic that has been widely studied and indexed by Google Scholar, for example the keyword intellectual capital. While the nodes marked in dark colors indicate that these topics have not been widely studied, such as the theme of leadership style, knowledge management and university performance, this can further foster opportunities to re-examine the role of intellectual capital in increasing the competitiveness of higher education.

Conclusion

The bibliometric analysis conducted in this study provides an overview and core innovation of articles in Google Scholar around the research topic of the role of intellectual

capital in improving university competitiveness. The results of the study indicate that the trend and pattern of research in the Google Scholar database were found to be still small, 13 papers (11 journal articles and 2 thesis results) and tend to fluctuate, the peak of research around this topic occurred in 2017 with 4 research articles. The countries with the most contributions were Jordan, Indonesia, Iraq and Malaysia with 2 studies. The results of the mapping using VOSviewer produced two main clusters, namely the red cluster of the main topic of knowledge management and the leadership style cluster. The limitations in this study were only using one database, namely Google Scholar. Then the application for mapping used was only the VOSviewer application. So that for the next researcher it is expected to be able to compare research databases more widely besides Google Scholar, and use applications for different bibliometric analysis.

Future research should explore the intersection of intellectual capital with leadership strategies and innovation management within higher education. Additionally, the role of intellectual capital in university performance in diverse cultural and economic contexts remains underexplored.

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