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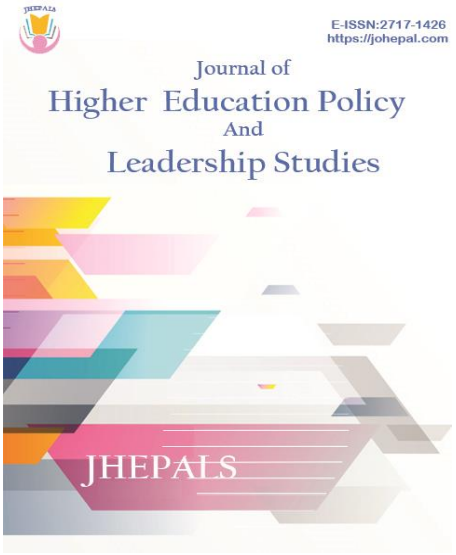
# Future Requirements and Challenges of Universities and Higher Education Institutions in the Knowledge-Based Economy: Literature Reviews

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# Future Requirements and Challenges of Universities and Higher Education Institutions in the Knowledge-Based Economy: Literature Reviews

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## Highlights

- This research provides a general review to identify the requirements and challenges that universities and higher education institutions face in adopting a knowledge-based economy approach.
- The mission of universities and higher education institutions has undergone a fundamental change in order to respond to the economic needs of societies and now moving towards the paradigm of a knowledge-based economy.
- The future requirements and challenges of universities in the knowledge-based economy approach can be categorized into four major axes: transformation in human capital, revision of missions, modification and change of infrastructures, and responding to challenges.
- As key players in the knowledge-based economy, universities have undergone significant changes in their missions, strategies, and infrastructures.

**Keywords:** Knowledge-Based Economy; Knowledge Economy; University; Higher Education; Future Studies

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## Introduction

Governments and international economic organizations are formulating strategies and frameworks aimed at establishing a knowledge-based economy. In such an economy, wealth and income are derived from the capacity for knowledge and innovation. In the 1990s, influenced by the Organization for Economic Co-operation and Development and other international agencies, many governments embraced the concept of the "knowledge economy." They believed that this approach would provide solutions to various issues (Broström et al.,2021).

In pursuit of this objective, policymakers revisited the mandates and missions assigned to higher education institutions and universities. Their aim was to transform these institutions into engines of knowledge production and skill enhancement, driving the achievement of a knowledge-based economy (Wright et al., 2022) This shift involves a transition from a traditional, resource-based economy to an emerging knowledge-based economy, where creativity, knowledge, and the efficiency of intellectual labor replace reliance on natural resources and physical labor (Horváth & Berbegal-Mirabent, 2022)

Based on this foundation, the knowledge-based economy can be understood as the outcome of governments moving away from a resource-based economy and embracing efficiency and effectiveness as the ultimate stage of global economic reconstruction (Hadidi & Kirby, 2016) Consequently, the global interest in the knowledge-based economy has become a necessity, with knowledge having transformed into a valuable asset and the primary component of the modern economic system. Universities and the creative force they cultivate play pivotal roles as two pillars of this emerging economy, which is known as the knowledge-based economy (Jawhar et al., 2022).

The significance of this emerging economy is evident in various conferences, reports, and research projects. For instance, a joint report by the European Union Office for Coordination in the Internal Market (OHIM) and the European Patent Office (EPO) in September 2013 revealed that 26% of employment and 39% of the European Union's gross domestic product were attributed to the knowledge economy (Răulea et al., 2016). Accepting the notion that the knowledge-based economy is the future economy brings forth new demands for university systems (Wright, Shore and editors, 2022 & OECD,1998). While previous studies have overlooked the future requirements and challenges that universities face in the knowledge-based economy, it is crucial to have a comprehensive understanding of these factors.

## Research Methodology

To gather data, relevant keywords were selected based on library sources and related texts. These keywords included various terms related to the knowledge-based economy (knowledge-based economy, Knowledge Economy, economy of knowledge, knowledge intensive, economy of knowledge, knowledge based society, knowledge economies, knowledge-based economies, knowledge-based economy, knowledge-driven economy, knowledge-based economy, knowledge-intensive capitalism, knowledge capitalism, learning economy, new economy, information economy, creative economy , weightless economy, Goldilocks Economy.), as well as terms pertaining to universities and higher education institutions (e.g., university, academic, college, higher education institutions).

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Searches were conducted using "and" and "or" operators across multiple databases, including PubMed, Web of Science, Google, and Google Scholar.

During the search process, separate and combined searches were conducted in domestic Persian language databases due to search limitations.

The review covered studies published between 2014 and 2023, spanning a ten-year period. Initially, 809 studies were retrieved, and after applying screening and inclusion criteria, 48 relevant studies were identified. Inclusion criteria encompassed articles in Persian and English related to the research topic, while exclusion criteria included letters to the editor, notes, and articles with inaccessible full texts. After selecting the pertinent studies, the concepts and findings of each article were summarized. The future requirements and challenges faced by universities were extracted from the selected articles and categorized accordingly, aligning with the study's objectives. The results of the database search and screening process is presented in Figure 1.

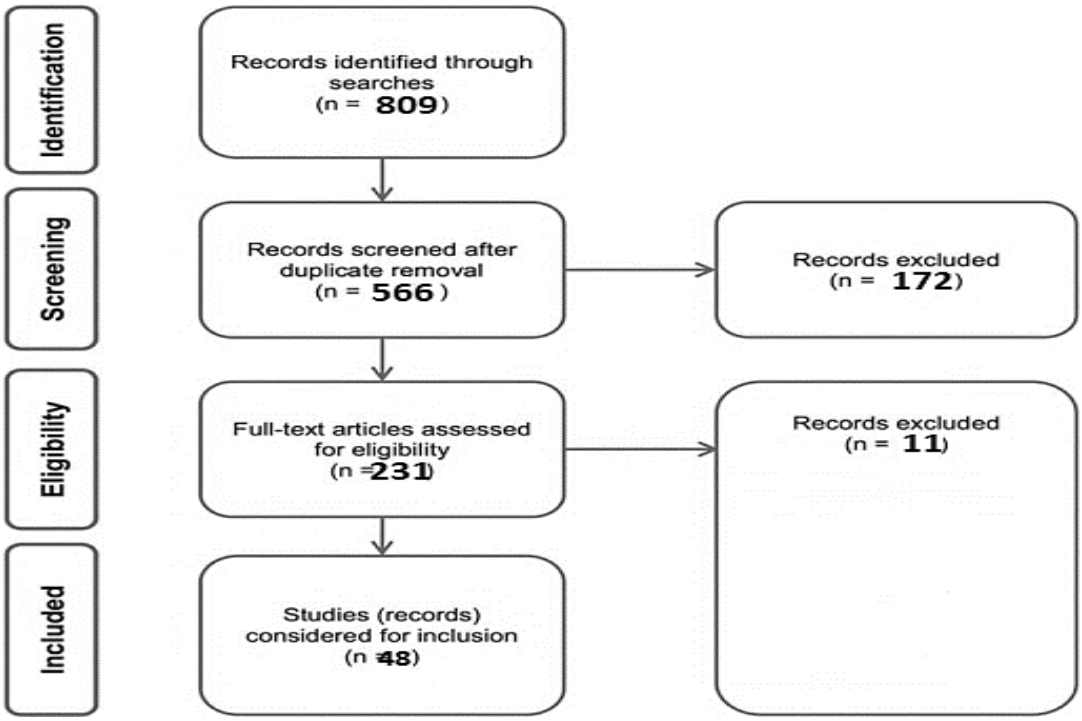


Figure 1. Selection procedure of research articles

## Results

An overview of these research articles as well as the codes/ categories is available as Online Supplement. A thorough review of data analyses was conducted. After analyzing data, the researchers ended up with four main themes and several sub-themes (see Table 2.)

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Table 2.
Emerged Themes and Subs-Codes and Categories extracted from these studies.

| Themes | Sub Themes |
|---|---|
| Capital and human resources | Training human resources<br>Revamping curriculum to enhance cognitive skills.<br>Lifelong learning.<br>Teaching intellectual property rights.<br>university-government-private sector collaboration to develop workforce training programs.<br>Convincing the workforce through facilitating the rapid adoption of new technological.<br>Training in economic skills. |
| Background factors and infrastructures | Infrastructure for strengthening industry-university relations and collaboration.<br>intellectual, institutional, and structural transformation.<br>Knowledge management infrastructure<br>Research and development infrastructure.<br>Establishing science and technology parks.<br>ensuring access to necessary information.<br>Infrastructure for transforming universities into "entrepreneurial" or "stakeholder".<br>Legal and regulatory systeminfrastructure. |
| Redefining missions and visions | Mapping a mission to transform universities into learning and entrepreneurial organizations.<br>Entrepreneurial and commercialization mission for research<br>Holistic approach to the education-research-innovation triangle.<br>Professional management and creativity in practice.<br>Mission of adaptability and compatibility. |
| Challenges ahead | Lack of universal access to up-to-date education.<br>Lack of public awareness of the importance of intellectual property.<br>Inadequate entrepreneurial capacity.<br>Neglecting the commercialization of knowledge.<br>Lack of management competencies and insufficient infrastructure development.<br>Inappropriate mission statements for entrepreneurship and innovation.<br>Instability in planning and implementation.<br>Insufficient skills in the workforce. |

## Discussion

According to the study results, one of the future necessities for universities in the knowledge economy lies in the realm of human resources, a requirement that has been evaluated in several studies. Research literature indicates that knowledge is the driving force of the 21st century economy (Gyimah-Brempong et al., 2006; Keun et al., 2009; Krueger & Lindahl, 2001). In this regard, several studies have shown that human capital is one of the most important factors in the process of economic growth. Further studies also confirm the effect of human capital on economic growth and indicate that human capital has a positive effect

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on economic growth (Waheed, 2014; Kuloglu, 2012; Edrees Panel, 2016; Duderstadt, 2002). In order to transition towards a knowledge-based economy, a well-equipped workforce is essential for the creation, dissemination, and utilization of knowledge within the economy (Park, 2018; Comunian, 2015; Durazzi, 2019; Wright et al., 2022; Răulea, 2016).

According to research findings, one of the future requirements for universities in a knowledge economy is to address infrastructures and underlying factors necessary for a knowledge economy approach. Various studies have examined this requirement. The research findings indicate that due to globalization, emerging trends, and technological advancements in the dynamic economic landscape, there has been a gradual shift towards prioritizing the knowledge economy.

Universities, as key players in education, research, and higher education, play a vital role in this transition. Traditional infrastructures are inadequate to meet the demands of an emerging knowledge-based economy. It is crucial to establish suitable infrastructures in three dimensions: software, hardware, and skill enhancement. These dimensions encompass policies related to science, technology, and industry, fostering innovation, lifelong learning, and entrepreneurship, as well as enhancing workforce skills. This holistic approach aims to maximize benefits and maintain a competitive advantage. Investing in the four foundational pillars of the knowledge economy, which are education, innovation, information and communication technology, and a favorable economic environment, is crucial for the sustainable growth of a knowledge economy. So, universities play a vital role here by formulating coherent policies that prioritize knowledge at the heart of their development strategies (Mburu, 2012; Anochiwa, 2014; Edrees Panel, 2016; Suciu, 2011; Finegold, 2006; Salem, 2014; Ramady, 2010). Additionally, institutions and secondary infrastructures are needed to provide a foundation for cultivating practical skills for startups and fostering cooperation between universities and industries (Gorji & Alipourian, 2011).

The findings also indicate that another requirement for future universities in the knowledge economy is the redefinition of their missions and visions. This requirement has been evaluated in some studies. In general, the development and change of universities' visions and missions to align with knowledge-based economies is essential in order to direct knowledge inputs in universities towards appropriate opportunities that can transform them into "entrepreneurial" or "stakeholder" universities.

In line with the findings of current research, studies have also referred to the need for a shift in the vision and mission of universities in the era of a knowledge-based economy. The new mission requires attention to a trained workforce for acquisition, utilization, creation, and effective dissemination of knowledge and relevant skills, leading to increased productivity and economic growth (Gorji & Alipourian, 2011; Brown, 2008; Lešer, 2018; Ibraheem, 2018).

Based on the reviewed literature, one of the other issues that universities face in the knowledge economy is the future challenges of universities. This necessity has been assessed in some studies. The literature review related to the challenges ahead of universities has shown that with the transformation of information and communication systems and changes in the economic approach, the role of educational institutions has also changed and requires a new and appropriate approach. This transformation poses new challenges to the higher education system and universities. According to the findings,

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universities face challenges in the knowledge economy due to a lack of managerial competencies, insufficient infrastructure development in entrepreneurial and innovative missions, inability to convert knowledge from publications into patents and technology, distance from industry and market, unskilled workforce, inappropriate knowledge economy infrastructure, and lack of appropriate human skills. The conducted studies have also shown that the efficient utilization of unskilled labor presents challenges for a knowledge-based economy in the 21st century (Gorji & Alipourian, 2011; Zieba, 2011; Răulea, 2016; Oriji, 2023).

## Conclusion

The 21st century has been accompanied by significant social and economic changes, giving rise to the knowledge economy era, resulting in a change in the nature and expectations of universities due to the increasing importance of knowledge. The traditional approach in higher education was unable to meet the needs of the knowledge economy and lacked the necessary conditions. Therefore, attention must be paid to new approaches in the roles, missions, and infrastructures of universities. In general, for universities to transition from a traditional system to a new system that responds to the knowledge economy, they need four fundamental dimensions: technological changes and innovation in their missions, responsive and relevant human resource development, and efficient infrastructure required for the shift from a traditional economy to a knowledge-based one, and addressing the forthcoming challenges.

The findings of this research demonstrate that knowledge creation is the main engine of knowledge-based economic growth, and for universities to achieve this, they need structural reforms in workforce transformation, redefining missions and visions, and changing infrastructure while considering the challenges ahead for the transition from a traditional approach to a knowledge-based approach. Technological transfer, new methods and tools for learning, increased focus on practical classes and marketable skills, lifelong learning, teamwork, change in university strategies, creating appropriate infrastructures for commercialization, workforce transformation, promoting entrepreneurial paradigms, intellectual property rights promotion, moving towards skill-based education, creating knowledge management capabilities, and considering new missions along with addressing the challenges hindering the transition towards a knowledge-based economy are essential requirements. In general, it can be concluded that universities, by becoming key players in the knowledge economy, have undergone fundamental transformations in all dimensions beyond their traditional duties, resulting in new and serious challenges in the emerging economic paradigm. Their response to the challenges arising from these transformations will determine their future role in the knowledge economy.

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## Declaration of Conflicting Interests

The authors declare that there is no conflict of interest.

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## Human Participants

This is a review and does not involve human participants; however, required research ethics are observed in alignment with the journal's policies as well as researchers' affiliated universities.

## Originality Note

The author s confirm that the manuscript is their original work, and if others' works are used, they are properly cited/quoted.

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