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The Role of Knowledge-Based Economy in Third Generation Universities

[1]Amir Azad Armaki, [2]Shahrooz Sedghgooyan, [3]Narges Lashgari, [4]Narges Nejad Rasoul

[1]Department of Business Administration, Department of MBA, University of Stratford, Virginia,USA.
[2]Instructor of Azad University, Shahriar, Branch, Tehran, Iran.
[3]Master of Accounting, Department of Humanities, Parand Branch, Islamic Azad University, Tehran, Iran.
[4]Master of Accounting, Department of Humanities, Parand Branch, Islamic Azad University, Tehran, Iran.

Abstract
Entrepreneurial society refers to places where knowledge-based entrepreneurship has emerged as a driving force for economic growth, job creation and competitiveness. In this context, entrepreneurial universities play an important role both as a producer of knowledge and as a publishing institution. In the literature, several studies contributed with relevant findings. Most of these studies show a tendency to use case studies to explain this phenomenon. Paying attention to the role of knowledge in the economy of economic growth is not a new issue, in the way that Adam Smith paid attention to the role of expertise in production and economy in the 18th century. Although the term knowledge-based economy entered the American economic literature in the 1960s, the developments of the 1990s renewed and revived this term, and it has become a very common topic in economic development in recent years. This article uses the library method. Therefore, in this article, according to the importance of the subject, definitions of economy, knowledge and knowledge-based economy are first presented, and then the prerequisites for the establishment of knowledge-based economy and the relationship of third-generation universities in knowledge-based economy are discussed.

Keywords: knowledge, economy, knowledge-based economy, knowledge-based companies.

Introduction

Paying attention to the role of knowledge in the economy and economic growth is not a new issue, as Adam Smith paid attention to the role of allocation in production and economy in the 18th century and Friedrich List emphasizes that the creation and distribution of knowledge contributes significantly to improving efficiency in the economy. Schumpeter's fans such as Hirschman, Galbraith and Godwin pay special attention to the role of invention and innovation in the dynamics of the economy, and Romer and Grossman, by presenting a new theory in the field of human capital, play a major role for science and knowledge in long-term economic growth (Mohammadi et al., 2020).

Universities around the world are increasingly shifting from their traditional primary role as educational providers and creators of scientific knowledge to a more sophisticated "entrepreneurial" university model that includes an additional role. Commercialization of knowledge and active participation in the development of private companies in the local and regional economy. As a result, universities become an increasingly important component of the national innovation system and need to operate increasingly within the framework of a triple helix that involves close interaction with public institutions and private industry (Etzkowitz et al., 2000).

For three reasons, this necessity is expected to be even more urgent for universities to change from their traditional model to the new model of "entrepreneurship" in the context of newly industrialized Asian economies. First, universities in most of these national institutions are relatively younger institutions compared to their counterparts in advanced and mature economies, and are invariably established as public institutions under government ownership and regulation. The shift to a knowledge-based economy, rather than

an economy based on low wages and natural resource advantages, requires a significant increase in the indigenous capabilities of local firms to create and commercialize new knowledge, rather than simply using knowledge imported from advanced countries. However, many local private enterprises developed in the early stages of industrialization are still laggards rather than leaders in participation in R&D and innovation activities. As a result, compared to their counterparts in advanced economies, local industries in newly industrialized economies often have less experience and less ability to commercialize knowledge generated from local universities (Wong et al., 2007). The need for the university to play an active role to help foster a more entrepreneurial mindset among students, where the highly educated population had relatively little entrepreneurial inclination, is even more necessary (Lee et al., 2005).

The term knowledge-based economy, which was first proposed by the OECD, shows the important role of knowledge and technology in the economy, and it can be said that the knowledge-based economy refers to at least two features of the modern economy: First, in the knowledge-based economy, knowledge is qualitatively and quantitatively more important than in the past, and second, the use of information and communication technology (ICT) is the driving factor of the new economy. In this context, some researchers have examined the impact of knowledge through the use of information and communication technology in society and argue that ICT and especially the Internet provides the basis for a knowledge-based economy by removing existing barriers (Nazeman and Islami Far, 2010).

Nevertheless, the difference between the views of the past and today regarding the role of knowledge in the economy can be summarized as follows: In the past (19th and 20th centuries), tangible factors such as physical capital, labor and natural resources were considered as production factors and elements of economic growth. But today (21st century) in addition to the above factors, intangible factors such as knowledge, information and cultural characteristics are considered as new sources of economic growth. Also, in the past, technology and knowledge as exogenous factors had an effect on production and economic growth, but today it is believed that these factors are endogenous and affect the efficiency of all factors and sources of economic growth (Mirmoazi, 2012).

Currently, the economy of developed countries relies on the production, distribution and use of knowledge more than anything else. In this situation, higher education institutions are not considered as knowledge production and distribution institutions, only as research and education centers, and these institutions are expected to play a more active role in the production of the national and regional economy (Etzkowitz, 2003). Today, knowledge as an intangible capital and asset has found an important place in the organization. The best and most effective application of organizational knowledge in an organized and managed manner creates significant economic, social and cultural progress. (Azadarmaki et al., 2021) Organizations achieve their goals with multiple resources and assets. Some of the most valuable resources and assets are unique and exclusive to gain a competitive advantage. Such cases are considered as the final alternative to the production of knowledge, wealth and monetary capital. (Azma et al., 2015) When it comes to training and improving human resources, a change in the skills, knowledge, attitudes, or social behavior of people is desired (Forghani et al., 2021). As knowledge is increasingly considered as an important component of innovation, universities play a greater role in industrial innovation as knowledge production and distribution institutions. In the last two decades, governments around the world have noticed the potential of the university as a resource for improving the national innovation environment despite the differences between the academic and industrial systems (Etzkowitz et al., 2000). The transformation from a traditional university to an entrepreneurial university will play an important role in the development of the global knowledge-based economy (Arnaut, 2010). In fact, the idea of knowledge-based development and the development programs of countries have imposed the mission of entrepreneurship on universities. This trend can be observed in developed countries since the late 1980s (Etzkowitz, 2003; Bienkowska & Klofsten, 2012).

So far, many studies have been conducted in the field of entrepreneurial universities, and most of the studies emphasize the undeniable role of entrepreneurial universities on the economic, social and cultural development of countries (Agarwal and Shah, 2014; Stebro, Bazazian, & Bragwinski, 2012; Adretesh, 2014; Etzkowitz, 2013; Mahdavi Mazdeh, Razavi, Hasamamiri, Zahedi, and Elahi, 2013; Rotharmell, Agung, & Jiang, 2007; Spurn, 2001; Toole, 2007; Walsh and Huang, 2014; Wong, Ho, & Singh, 2007; Wood, 2011). Entrepreneurship is the economic driving force of developed and developing countries. Some experts consider entrepreneurs as the main driver of the economic growth of society and the real pioneers of economic and social revolutions. Therefore, in today's competitive and knowledge-based world, attention to

entrepreneurship is one of the main concerns of various institutions and centers, including universities around the world (Taherkhani et al., 2022).
Universities have a prominent role in any discussion about the production, dissemination and application of knowledge and innovation that supports economic growth. While universities have long served as a source of technological advances for industry, Cooperation between university and industry has intensified in recent years due to four interrelated factors: development of new technology platforms with high opportunities such as computer science, molecular biology and material science; More general growth of the scientific and technical content of various industrial products; The need for new sources of university research funding, which has been created due to budget stringency and the prominence of government policies aimed at increasing the economic efficiency of publicly funded research by stimulating university technology transfer.

The main research question

1- What is the role of knowledge-based economy in third generation universities and entrepreneurial universities?
2- What is the necessity of entrepreneurship in universities?

Literature Review

Economy: One of the meanings of economy in the word is moderation and avoiding extremes in everything. In another definition, economics is the study of human actions in the normal course of economic life, that is, earning money and enjoying it to educate life (HamidiFar, 2010). Economics is the science of optimal allocation of limited resources to meet human needs as much as possible, and it is the science of discovering the relationship between economic phenomena. Human needs or interest in development and welfare have caused the emergence and growth of sciences, especially economics (Asadi, 2014). It can be clearly seen that one of the factors affecting the underdevelopment of economic enterprises in the country in terms of competitiveness in international arenas is the existence of problems in terms of scientific and practical development of marketing in economic enterprise.(Azad and Davoodi,2023)
Knowledge: Knowledge is an accumulated store of information and skills that result from consuming information. In another definition, it is stated that knowledge includes a flow of new experiences and information. Knowledge is created in a person's mind and is used (Bafandeh and Soltani Fesqandis, 2008).
Knowledge-based economy: It is an economy where knowledge is the main key to economic growth. In it, knowledge is acquired, produced and disseminated and is used efficiently and effectively to increase economic development (Abonuri et al., 2013). With the continuous application and production of knowledge as the core of the economic development process, the economy necessarily becomes a knowledge-based economy. Although the term knowledge-based economy entered the American economic literature in the 1960s, the developments of the nineties renewed and revived this term, and in recent years it has become a very common topic in economic development. The roots of the knowledge-based economy go back to the economic records of the early 1980s (Porfaraj et al., 2012).
According to OECD, the knowledge economy is an economic base that is directly based on the production, distribution and consumption of knowledge and information. In the knowledge economy, knowledge is the main driver of growth, creating wealth and employment in all fields of activity. In today's era, the term knowledge-based economy, which has been specially emphasized by the Organization for Economic Cooperation and Development in the development strategy of the nations, is indicative of the emphasis on the role of knowledge and technology in the course of economic development. Therefore, it can be said that in the knowledge-based economy, knowledge is considered qualitatively and quantitatively more important than in the past. Knowledge-based economy is an economy in which knowledge is created and disseminated and is effectively used by economic actors for better economic and social development. The Asian Economic Cooperation Organization expanded this idea and stated that in the knowledge-based economy, the production, distribution and use of knowledge is the most important factor driving growth, wealth creation and employment in all industries. Since in new technologies and knowledge-based economy, the power of productivity and production efficiency increases, therefore, the governments of the world, both industrialized and developing, are determined to transform education and skills acquisition towards a knowledge-based economy (Aghajani and Mujaddid, 2014).

The course of evolution and the need to pay attention to the knowledge-based economy, a look at the evolution of the economies of various countries shows that in primitive societies, labor was the total input of production. After that, the use of land causes the transition to our pre-development society with labor and land data. In the next stage, capital is added to the initial data and developing communities emerge. The development and expansion of entrepreneurs and information at this stage turns developing societies into industrial societies, and the addition of technology and research and development expenditures to the primary data of production in industrial societies turns them into economically developed societies. Therefore, the last stage of the leap towards advanced industrial (information) societies is the entry of knowledge into the field of production, distribution and consumption. At this stage, knowledge is the main factor of growth, and most of the added value of society's production is due to knowledge, and in a way, knowledge is the main factor of production, well-being and the engine of economic growth (Burke, 2000). In fact, knowledge has become an integral part of all the laws surrounding us in the modern economy, and it is very difficult to imagine that we can raise living standards and live a longer and healthier life without significant progress in knowledge and its application in goods and services (Freeman, 2014).

Table 1 shows the three types of agricultural, industrial and informational (knowledge) economies and states what the production data, production formation process and economy headquarters are in each of these economies. It also identifies the innovation associated with any type of economy. In a society with an agricultural economy, the available data is the labor force, land and capital, and the production process of cultivation and agriculture, which ultimately leads to the production of agricultural materials. The innovations that happen in different stages of agriculture are the use and application of animals to facilitate agriculture and agriculture and to some extent the use of machines for production.

In the second stage, which is the stage of entering industrial economies, entrepreneurship and technology are added to production data in addition to labor, land and capital, which were also part of agricultural economic data which is obtained during the process of processing and factory in the end, which are capital equipment, industry and physical products. The innovations used at this stage are the use of mechanization process and science and technology research (Emadzadeh et al., 2006).

It should be mentioned here that knowledge also played a major role in this stage of economic history, so that England was able to achieve a leadership position in the industrial revolution in this period with the link between existing knowledge sources and innovation (Landes, 1999), Or, by strengthening the connection between educational and industrial organizations, Germany was able to improve its position among the countries of the world and even industrialized countries (WBI, 2007).

Table 1: Stages of transformation and transition of economies

Type of Economy	**Data**	**process**	**headquarters**	**Innovation**
Agriculture	Labor, land and capital	Farming	cereal	Use of animals, use of cars
Industrial	Labor, land, capital, entrepreneurship, technology	Factory and processing	Capital equipment, industry, physical products	Using the research machine (science and technology)
Information	Labor, land, capital, entrepreneurship, technology, information, knowledge	Movement and control	Knowledge products, knowledge-based industries, knowledge capital	Knowledge and information of virtual simulation of networks

But with the beginning of the 1990s, the world clearly realized that a new type of economy is emerging, which offers a different basis for the economic development of countries. This economy, which is known as the new economy or knowledge economy (information), is the result of the interaction of globalization, the development and evolution of knowledge. In this economy, the key to creating economic value or wealth and reaching a high standard of living is the accumulation and application of knowledge in the activities and

globalization of the economy (Hosseini and Bighosh, 2005). In the knowledge-based economic system, knowledge capital replaces physical capital, innovation replaces tradition, and new ideas replace manual work as the main source of economic growth (Baseri et al., 2011).

These changes caused the definition of the development gap to change, meaning the distance between the existing situation (underdevelopment) and the development conditions. In the old economy, the gap between rich and poor countries was explained by the gap between factors, and the necessary tools for economic development were raw materials, physical capital (machines, factories, and roads) and human capital (educated labor), While in the modern economy and knowledge economy, there is a different gap called the gap of ideas or knowledge, and at the same time, poor countries need ideas or knowledge that produce economic value in industrialized countries and thus create prosperity (Although these two gaps can co-exist and poor countries suffer from both). In this way, the challenge of development in the 21st century has become different from the challenges of development in the last century. Also, although the increase in communication and better understanding of the development process has created suitable opportunities for developing countries, it should be noted that taking advantage of this opportunity requires the provision of appropriate infrastructure for the new arena, That is, education and investment in human capital, government support policies, information and communication technology, appropriate social, political, economic and legal environment for investment, production and trade, which are among the most important prerequisites for a knowledge-based economy. These prerequisites must be provided with such quantity and quality in the economy of the countries that can respond to the very high speed of developments in the field of science and new technology; Because the global economy is changing at an unprecedented rate (Levy et al., 2010). The speed of changes in knowledge-based economies is much higher than in any other period of history, and therefore the opportunity cost of time for countries has increased a lot. In other words, if a country fails to put itself on the path of the global knowledge revolution, it will quickly be marginalized, which is much more than the marginalization caused by the industrial revolution and this necessity doubles the attention to this important, knowledge-based economy.

The Difference Between Knowledge-Based Economy and Traditional Economy

In traditional models of economic activities, the main factors of production are: land, labor, capital and entrepreneurs. Knowledge-based economy plays a fundamental role in expanding the scope of work, from producing goods in the assembly line to creating more flexibility in designing, manufacturing and implementing business ideas.

A knowledge-based economy is characterized by the presence of more highly skilled workers and jobs that require specific knowledge or skills. Unlike the past, when the economy was heavily dependent on unskilled jobs and mostly involved the production of physical goods, the modern economy is made up mostly of service industries and jobs that require thinking and analyzing data. In a knowledge-based economy, the most valuable assets a company owns are often intangible assets, such as patents, copyrights, or proprietary software or processes. This is in contrast to traditional economic periods, such as an agricultural economy where land was usually the primary asset, and an industrial economy where factories and production equipment were the key assets of most businesses. The difference between the economy of scholars and the traditional economy can be easily seen in Table 2:

Table 2: The difference between the knowledge-based economy and the traditional economy (Pettinger 2017)

Characteristics of an Economy	**Traditional Economy**	**Knowledge-based Economy**
Resources	Tangible assets	Intangible assets (information, knowledge)
people (employees)	source of cost	Fund
Scope of authority	Dominated and dependent on organizational authority	depending on the skill, knowledge and credibility of people
Strategy	Competition oriented	Cooperation oriented

Market value	Related to financial acquisition and fixed assets	dependent on intellectual and spiritual capital
Progress and development	Linear, predictable	Irregular, unpredictable

Characteristics of Knowledge-Based Economy

- ✓ The creation and introduction of new ideas, in the knowledge-based economy, ideas and opinions are welcomed and supported with complete freedom of expression, and new and useful ideas are welcomed and supported.
- ✓ The suitable environment for economic activities, the ability of the economy to benefit from the transfer of knowledge at the international level, which depends on the level of human capital development and its accumulation rate. The economy should be competitive and entry and exit should be free, taxes should be such as to encourage private sector investors in production units.
- ✓ International orientation, the government should move towards internationalization and interact with the global economy, which is a means of producing or absorbing knowledge. In this regard, foreign direct investment, which is based on building the confidence of foreign investors in the capacity of the economy and providing investment returns, is considered as a measure of the degree of openness of the economy.
- ✓ Innovation is in the form of two chain (new) and linear (traditional) models, which the knowledge-based economy uses the chain model. This means that according to the need, new abilities are formed and include improvement in existing products and the use of technology, which requires communication between different departments such as companies, laboratories, research and scientific institutions, and consumers.
- ✓ Investing in the knowledge-based economy, a significant part of the investment is directed towards the basic knowledge sectors and its microstructures such as ICT infrastructure. The government should pay great attention to the development of the mentioned items by investing in the country's infrastructure for a long time and ignoring the opportunity cost that is lost by investing in infrastructure projects.
- ✓ Permanent and continuous education and learning because knowledge and science are up-to-date and must be updated and new and must be learned from previous generations and because science is in the process of evolution and change, he discarded some of the past sciences that are obsolete and have no scientific use, updated them and used them.
- ✓ The characteristic employment of the knowledge-based economy is the increase in demand for highly skilled and highly paid labor. The wages of semi-skilled and unskilled workers in this economy have decreased and the difference between skilled and unskilled workers has increased and the reason for this is that simple and uneducated workers cannot use them because the devices and equipment used are of high technology.
- ✓ Information and communication technology infrastructure ICT in the knowledge-based economy, all people have access to information easily and at a cheap price (Qaragozlu, 2014).

Importance of Knowledge-Based Economy for Businesses: Knowledge-based economy can make businesses more efficient and dynamic and help create more innovative products and services. The knowledge economy enables the customization of products. In the knowledge-based economy, the role of human capital becomes more prominent and various businesses need more to attract, train and retain experienced and specialized employees. The new theories that are proposed in the field of growth and development emphasize the potential power of human capital and increasing knowledge, because these factors are new sources of economic growth and guarantee a high level of productivity. Collaborative networks can help a lot to increase the distribution of knowledge and benefit from new ways of working.

Knowledge Based Companies: In knowledge-based companies, employees work on the basis of their knowledge and earn money through their scientific research and generate wealth through research and research on their ideas and their application in the fields of services and innovative activities. Knowledge and research are considered basic principles in these companies. Knowledge-based companies do not produce any products,

providing information is one of the main services of these companies, and this is how they earn money. These companies are intermediaries between information and data.

According to Article 1 of the Law on Protection of Knowledge-Based Companies and Institutions and Commercialization of Innovations and Inventions, approved in 2010, Knowledge-Based Companies and Institutions is considered a private or cooperative company or institution that in order to synergize science and wealth, develop a knowledge-based economy, and realize scientific and economic goals (including the expansion and application of inventions and innovations) and the commercialization of research and development results (including design and production of goods and services) in the field of superior technologies with a lot of added value, especially in the production of related software.

A knowledge-based company is a company or a legal institution established by creating a knowledge-based business in order to transform knowledge into wealth and its economic activities are based and accompanied by research and development activities in the field of new technologies that help the development of knowledge-based economy in the society. Knowledge-based business is not a temporary and once-for-all work, but a constant and dynamic process (Mahdavi et al., 2011). Important scientific centers, such as the Organization for Economic Cooperation and Development, have defined knowledge-based companies as follows: Those groups of people educated in scientific, research and research centers who have been able to bring in these centers, in addition to learning theoretical sciences and scientific theories, the methods of transforming abstract sciences into income-generating and value-producing activities (Kelich Lee and Makani, 2016). Knowledge-based organization is a changed model for organizations and a new way to rethink the organization in the age of knowledge. A knowledge-based organization is an organization that uses creativity, innovation and new knowledge in the process of producing and providing products/services. The competitive advantage of a knowledge-based organization is achieved through knowledge and the effective use of knowledge. A knowledge-based organization is achieved through knowledge and effective use of knowledge. A knowledge-based organization has four main characteristics. The process is the process of creating and sharing knowledge, the purpose of which is to use the knowledge produced by one part of the organization in other parts and units and to share explicit and implicit knowledge. A place that goes back to the boundaries of knowledge and often goes beyond legal and traditional boundaries in order to participate in the creation of organizational knowledge (Tabarsa et al., 2012). In knowledge-based companies, economic growth and job creation are realized in proportion to the innovation capacity. This means that research and development achievements are continuously transformed into new products, processes or systems through investment, and access to investment capacities for entrepreneurs and researchers is an important factor in creating innovation and exploiting the power of technology in the national economy.

Knowledge-based companies, the subject of knowledge, innovation, skills and continuous learning, play an important role. Various factors influence the growth and development of knowledge-based companies. These factors are different from other companies according to the nature of knowledge-based companies. Technical knowledge, expert manpower, effective support of the government at the beginning of the formation of such companies are among the most important factors affecting their development. The competitive advantage of knowledge-based companies is innovation in technology. These companies have a special capability for rapid growth. The activity of knowledge-based companies is considered as the engine of economic development of developing countries and is considered as the main source of job creation and facilitating the entrepreneurial environment, and they have the potential to accelerate creativity, innovation and opening new commercialization opportunities (Malek Ara, 2020).

Knowledge-based companies play a key role in developing the knowledge-based economy. Knowledge-based companies are private or cooperative companies that aim to synergize science and wealth, develop a knowledge-based economy, and achieve scientific and economic goals, including the expansion and application of invention and innovation and the commercialization of research and development results in the field of technology and with a lot of added value.

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2014). Knowledge-based economy can be helpful in a situation where the reduction of investment in the country's economy on the one hand and low productivity and the tendency to adjust human resources in organizations on the other hand have turned unemployment into a major economic and social problem of this time (Mousavi et al., 2020).

What are the characteristics of a knowledge-based company?

One of the most important features of a knowledge-based company is that although it does not offer specific products to the market, it creates educated people around itself and they start training them, in other words, these people are considered the products and goods of the knowledge-based company. These people have the ability to work in different areas.

Among the other advantages of a knowledge-based company, it can be said that the assets of such companies cannot be touched, therefore one of the most important concerns of knowledge-based companies and institutions has been to protect the intellectual rights of the company's information. For this reason, legal issues in these companies are very important and should be given a lot of attention (Alhiari Fard and Abbasi, 1390).

The concept of entrepreneurship: For about a decade, the term entrepreneurship has played a prominent role in the scientific and economic literature of the world; But unfortunately, due to the use of the word " Undertake " in the definition of this obvious concept of entrepreneurship, it is only summed up in job creation, and in a better way, it can be said that we do not have a correct understanding of this concept. The word entrepreneurship is derived from the French word Entreprenerd which means "to commit". According to the definition of Webster New Collegiate Dictionary: "An entrepreneur is someone who undertakes to organize, manage and assume the risks of an economic activity." (Ahmad Pourdariani, 2012).

But in another definition, entrepreneurship can be considered as the process of optimal combination of available resources in order to create value, which in this definition, the term process refers to the conversion of input into output and continuity of activity, Available resources means relying on available resources, raw materials and labor (so restrictions such as sanctions, etc. have no place in this definition because all reliance is on available resources), The meaning of the word optimal is neither minimization nor maximum, optimal means the best according to the existing situation or the contingencies, the word value includes different dimensions. In large organizations, it is critical to support entrepreneurial behavior at all levels of the hierarchy to grow performance and gain competitive advantage.(Alizadeh Majd et al , 2020)

the purpose of entrepreneurship is to make profit, but profit is not only limited to economic aspects and it includes various dimensions such as social, cultural, political values, etc. (Alizadeh Majd, 2016).

Entrepreneurship means recognizing and taking advantage of opportunities that were not previously recognized as opportunities. In fact, it is the creative use of resources to exploit opportunities (Nazem et al., 2021; Saadat et al., 2021).

The Third Generation University, Entrepreneur University: In the division of universities into first, second and third generation, it can be said that the first generation universities are education-oriented universities whose activities continued until the first decade of the revolution, that the purpose and duty of that university was to provide education and issue academic degrees, and these universities trained experienced forces for the development of the country. Second generation universities are also research-oriented universities that this generation of universities, in addition to the educational activities specific to the first generation universities, paid more attention to research and practical topics, and the result was an increase in the number of Iranian articles among advanced countries. The third generation university was expressed in the sense that the university is not just a place to learn a series of mere teachings and it is no longer a place that only conducts research projects in line with the economic goals of industries, Rather, in addition to advancing all these goals, it provides graduates to the society who use knowledge alongside applied research and create work with innovation. In addition to the production of science and the training of human resources needed for development, the third generation university or entrepreneur takes steps towards the commercialization of science and the establishment of knowledge-based companies, and the focus of the activities of the third generation university is on entrepreneurship (Nemat Elahi and others, 2019).

Table 3: Some characteristics of first, second and third generation universities

University generation	Goal	Role	Output	Management
first generation	Education	Keeping the truth	professionals	Chancellor
second generation	Education and Research	Knowledge of nature	Professionals and scientists	Part-time scientists
third generation	exploitation of knowledge	Creating added value	Scientists and entrepreneurs	Professional management

In the perspective of higher education for the 21st century, UNESCO has described modern or third generation universities as follows: A place where entrepreneurial skills are developed in higher education to improve the capabilities of graduates to become entrepreneurs (Omidvar, 2017). Entrepreneurial society refers to places where knowledge-based entrepreneurship has emerged as a driving force for economic growth, job creation and competition in global markets (Auderstsh, 2007). In this context, the entrepreneurial university plays an important role both as a producer of knowledge and as an institution. In this sense, an entrepreneurial university can be defined as a survivor of competitive environments with a common strategy that focuses on being the best in all its activities (such as having a good financial situation, selecting good students and teachers, producing quality research) And it tries to be the best in creating a link between education and research and is more constructive and creative (Kirby, 2005).
Consequently, an entrepreneurial university not only promotes multiple support measures for entrepreneurship, but also develops administrative techniques, strategies or competitive positions (Antoncic and Hisrich, 2001). Based on this, entrepreneurial universities may have different interactions in partnership, networks and other relationships with public and private organizations that are an umbrella for interaction and cooperation between the main elements of a national innovation system (Inzelt, 2004). This means that the entrepreneurial university implements several strategies and new institutional configurations to cooperate with the government and industries to facilitate the production and exploitation of knowledge and technology (Leydesdorff and Meyer, 2003).

What is a Start-Up?

In line with explaining the role of the third generation university in solving economic and social problems, the role of new businesses (or so-called startups) should also be paid attention to. Because entrepreneurship and solving economic and social problems are common goals of the third generation university and startups. According to Marinovich et al. (2019), new trends and approaches to use start-up companies significantly affect the education system. In fact, lectures and traditional teaching methods are no longer needed. Professors' use of collections of startups significantly improves the educational process. Otherwise, if the teacher is not willing to do this, he should stimulate the students to create good and new ideas. Startups have grown significantly in recent decades due to the Internet and related tools. A startup is a temporary organization in search of a scalable, repeatable and profitable business model. Startups are small and knowledge-based technology companies that play a large role in employment and the economy of society. Since innovative businesses are based on new knowledge and technology, they are considered as driving engines of the economy. In fact, such businesses are considered as driving engines, which, at the same time, move the wheels of employment and employment, cause the growth and dynamism of the society's economy and create a kind of economy. In fact, such businesses can play an important role in the economic growth of countries, creating employment and social welfare (Ali Mohammadi, 2017).
Tari and Parhalem (2020), in a research, have mentioned the role and importance of startup as follows; In the new global economy, startups are considered as key players in economic development. The reason for the importance of this issue is their role in creating employment and economic growth at the regional, national and industrial levels. Startups are known as important drivers of employment creation. Factors that create an entrepreneurial environment in a region play an important role in the success of creating and developing

startups. It is necessary that the elements of such an environment interact with each other like an ecosystem in order to create and nurture successful startups.
These businesses play an important role in inventing new methods that will lead to technological changes and increased production capacity. It can be said that such units are looking for change and competition, because they are changing the overall structure of the market. Also, the creation and development of these businesses is considered an important policy in creating new jobs, accelerating the improvement of the economic situation and the growth of countries, therefore, special attention should be paid to new businesses. These businesses are able to adapt to today's environment, and their structure allows them to adapt to extensive and all-round changes and developments, and makes their preservation and survival possible (Jalili, 2016).
In our country, due to the presence of young and educated workers, of course, a significant number of them are unemployed, start-up businesses can provide a suitable basis for creating employment (Nadafi and Ahmadvand, 2017). In order to provide the basis for the growth and development of startup activities in the country, the platform for the growth and development of entrepreneurship indicators in the country must be strengthened at the same time, and the creation of this platform requires an ecosystem view of entrepreneurship and the cooperation of other players in this ecosystem (Hosseini, 2017).
Through streamlining and streamlining the continuous knowledge management process, the university no longer needs to create a bridge between the industry and itself, rather, the industry is born and, in a better way, owes to the university, and progress in the industrial and economic field of the country needs an entrepreneurial university.
Therefore, the necessity of transforming the country's higher education under the umbrella of entrepreneurship is inevitable for reasons such as changes and environmental developments at the national and global level, changing public expectations, criticism of the financial and structural situation of higher education, and dependence on the government budget. Changes in higher education policies such as decentralization, reducing administrative duties, creating strong policy sets, creating and maintaining diversity in higher education and reducing bureaucracy, the importance of paying attention to customers and preserving the dignity of human beings, the advancement of information and communication technologies are other reasons (Alizadeh Majd and others, 2018).

The evolution of the relationship between industry and university in Iran

The relationship between the industry and the university has been the concern of the country's officials at the macro and micro level for years, and of course, various organizational, structural, legal, cultural, etc. responses have been given to it. The history of the government's efforts to develop university-industry interactions can be divided into five periods;
- The first period in the country started with the establishment of Tehran University and the definition of the basis of interaction in education. During this period, the government planned to coordinate universities with new industries. This process continued until the early 1940s (Mahdavi et al., 2009). During this period, there was no organized communication between the university and the industry, and if there was any communication, it was not in such a way that they were closely familiar with each other's issues and had continuous cooperation. In fact, in terms of industries, universities have only provided technical staff (Etzkowitz, 2003).
- The second period, which lasted from 40 to 60 AH and the interaction was based on education, with the difference that in this period, interns from the university were sent to government industrial companies to familiarize themselves with new imported technologies.
- The third period, which lasted from 61 to 74 AH and the basis of interaction between university and industry in this period was related to research as well as education. During this period, the interaction between the university and the industry progressed towards becoming more institutional, and the offices of communication with the industry were established in the universities (Shafiei al., 2004).
- In the fourth period, which lasted from 1374 to 1381 AH, it provides a new basis for interaction between university and industry, this new basis can be called technology development. In this regard, since 2000, the government has established science and technology towns, parks and growth centers in different provinces (Mahdavi et al., 2009). In general, the government's role in establishing a relationship between the university and the industry has been weak and on the other hand, politics and planning at the macro level have not been such that the university and industry can play their real role in the implementation of national development programs. The university was only expected to train (production) of the educated workforce and the industry

was only expected to produce goods, without quality control in both cases. The same issue has not been ineffective in diminishing the role of the university's relations office with the industry. The inconsistency of the ministries of science, research and technology and the ministries of industry, which is also affected by the policies and plans of the country as a whole, caused the connection between the university and the industry to not have a strong executive support (Mahdavi, 2008).

The role of universities in the industrial development of the country: Universities are considered to be one of the important centers for providing and training skilled and specialized human resources in the country. For the industrial development of any country, the existence of a number of competent human forces with a set of knowledge and practical skills is necessary because living in the vicinity of the machine requires having special capabilities that should be acquired by education and improved by experience. Therefore, it can be said that without the achievement of knowledge, there is no possibility of any development, and universities will play a major role in the development of the country, provided that in addition to training skilled human resources, they also emphasize the application of the learned material or, so to speak, entrepreneurs (Shafi Abadi, 2011).

Related Works Table:

Number	Authors	The Purpose of The Research	Findings
1	Alizadeh Majd et al., 2021	Analyzing the connection between universities and business development centers and determining how students, researchers and entrepreneurs can benefit from this connection.	Entrepreneurship can be recognized as a mechanism for the transfer of knowledge spillovers and therefore contribute to regional innovation, cluster formation and economic development.
2	Toshmali et al., 2020	Expressing the importance of entrepreneurial university and designing the model of the third generation university in Islamic Azad Medical Sciences Universities of Iran	The analysis of the conducted interviews identified the attraction of financial resources, the creation of innovation, the management of technological entrepreneurship and the entrepreneurial approach of the professors as the main categories of the third generation university.
3	Qolipour et al., 2016	The role of knowledge in the economy and economic growth in production	The importance of knowledge-based issues and the establishment of knowledge-based economy
4	Nazeman et al., 2010	It discusses the concept of economic sustainability knowledge and its role in achieving and sustaining development	At the global level, there is a significant relationship between economic development and the level of economic knowledge
5	Behbodi et al., 2010	Investigating the long-term relationship between different axes of knowledge in the framework of knowledge-based economy	There is a long-term relationship between different axes of knowledge
6	Liyanage & Netswera, 2022	Green universities with mode 3 and the five-spiral model of innovation - knowledge production and innovation in a knowledge-based economy	Finally, this theory was developed by induction based on interpretive philosophy when redesigning the conventional structure of universities. The proposed model designed is called "Green University System" to facilitate global green knowledge production and innovation for sustainable development

			with Mode 3 innovation model and Quintuple Helix.
7	Klofsten et al. 2019	The entrepreneurial university as a driver of economic growth and social change - key strategic challenges	Research limitations in various leadership areas and strategic issues facing universities seeking to become more entrepreneurial have focused this special issue on the management, development, and implementation of this vision.
8	Bercovitz & Feldman, 2006	Entrepreneurial universities and technology transfer: A conceptual framework for understanding knowledge-based economic development	This paper provides a framework to clarify the role of universities in innovation systems. This framework attempts to capture the economic, social, and political influences that affect the ability of universities to create new knowledge and apply that knowledge in economically useful ways, thereby contributing to economic growth and prosperity.

Proposed solutions for moving towards a knowledge-based economy in Iran

1- Investing to improve the skills of human resources, paying attention to on-the-job learning.

2- Support for invention and innovation and changing programs in technological knowledge from mission-oriented to promotion-oriented to create a suitable environment for research and development activities.

3- Creating the possibility of safe, fast and cheap access to the Internet and increasing telecommunication and communication facilities by creating a competitive environment in providing the possibility of Internet and ICT access by different companies.

4- Providing public services by the government online to the people, including tax services, job search, etc.

5- Knowledge management in the economy by the government, which consists of making informed and systematic decisions about the better use of knowledge in order to improve the state of efficiency in the country.

6- Creating a suitable environment for carrying out economic activities and investment through increasing economic security (Memarnejad, 2005).

Discussion and Conclusion

Knowledge has always been one of the main sources of economic development. The best economic performances are from those countries that have properly institutionalized knowledge and used it. The fundamental changes that have taken place in various economies during the last decade indicate the occurrence of a "knowledge revolution", i.e. a transition from a resource-based economy to a knowledge-based economy. The study of successful economies in the world shows that the period of economy based on traditional production is over and production based on knowledge and technology has entered the field instead. According to the definition of the Organization for Economic Cooperation and Economic Development, the knowledge-based economy is based on the "production, distribution, and application of knowledge and information" and a high level of investment is devoted to invention and innovation and the acquired technologies are intensively consumed and the workforce is highly educated. Today, the world has entered a new stage where the economy based on production and physical assets has given its place to the economy based on information and knowledge. Mr. Peter Drucker says in the book Management in the 21st Century: The world's knowledge doubles every seventy days. Therefore, knowledge is a vital resource in the field of competition and a vital factor for achieving a sustainable competitive advantage.

It should be noted that the future of modern society with a dynamic economy depends on increasing competition and the desire to grow and innovate. In such spaces, universities are considered as the most effective institutions in the knowledge-based society. In this regard, universities and higher education systems are promoting their traditional role and moving towards the production of indigenous knowledge and economic growth and reaching regional and international development, which is actually a kind of movement

towards entrepreneurial universities that create new knowledge and ideas and change them to practice in the best form. And change them to practice in the best form.

Organizational structure and design should assume the role of facilitating and supporting innovative and entrepreneurial behaviors in a way that they are granted and decision-making should be decentralized. Decentralization, informality, verticality or horizontality, freedom from information communication, teamwork, flexibility, organizational structure supporting new ideas, easy control and informality and productive employees are structural features of the entrepreneurial university that is able to encourage and develop entrepreneurship. Discussion groups and informal discussions between students and faculty members can also be created to foster entrepreneurship. In the case of graduates, the University's Office of Graduate Studies can take the following actions: Establishing a close and active relationship with graduate students, encouraging research and innovation projects, regularly holding graduation gatherings, holding conferences and meeting with graduate students and offering support services to them. training them to improve their employment conditions and supporting them for life, creating a community of entrepreneurial graduates and focusing on discussion groups. Knowledge-based economy, by creating the necessary platform for innovation and presence in competitive markets, will bring the economy of developing countries to prosperity. The importance of the knowledge-based economy is that with the use of knowledge, access to innovation, education and communication and information technologies, all societies are encouraged to move towards progress and development by relying on knowledge.

Entrepreneurship is a broad concept that can be seen in several scenarios including real cases, scientific projects, new companies and also in the configuration of societies. In particular, in this last scenario, added value is created through entrepreneurial opportunities that differentiate between the traditional and the new knowledge economy. In this context, entrepreneurial opportunities with the production and exploitation of knowledge are considered as the key factor of production in this economy (Romer, 1986). In addition, the university has experienced several cultural, educational, institutional and legal challenges in order to survive in a competitive global environment.

As a result of these challenges, the phenomenon of entrepreneurial universities has emerged with a common strategy focusing on entrepreneurship at all university levels. This is not surprising because since its establishment, the university has been considered as an innovation to cover the needs of the communities (Finlay, 2004).

However, universities are complex organizations that include a number of nested and overlapping communities of practice, and the economic benefits of universities to the local area are not very visible.

In this sense, the university wants to develop several strategies, structures and cultures to strengthen: (1) Better methods of quality education based on personal growth that supports creativity and entrepreneurial experience. and (2) better strategies for incentives.

Also, industry requirements are evident with the need for strong collaboration agreements between academia and industry. Specifically, small and medium enterprises need these mechanisms to survive in a competitive environment, because in the new economy, the main strategic advantage of the company is its knowledge and human capital. The university produces ideas and qualified human resources while industry has the economic resources to transform ideas into economically useful products.

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