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Research Paper

*Developing a sustainable university Model and its relationship
with knowledge-based economy in Islamic Azad universities of
Mazandaran province*

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Abstract

In the modern world, Universities as a place of entrepreneurship Which strategically serve as engines for sustainable economic growth and technology development are well known. This research is an applied research in terms of purpose and descriptive-survey in terms of method. In this study, the relationship between sustainable university and knowledge-based economy in Islamic Azad universities of Mazandaran province is investigated. The statistical population includes all members of the faculty of free universities of Mazandaran province with 1461 people in 14 units and The final sample size based on Cochran's formula will be 304 people, 348 people have been selected considering at least 10% of the sample drop. Data were collected from the field method and library resources and questionnaires and designed to analyze the data obtained from the questionnaire, SPSS and AMOS software were used. Research findings show; There is a significant and positive relationship between the factors affecting a sustainable university and knowledge-based economy and it has been shown According to the accepted theories in knowledge-based economics, University has always been one of the main levers has been noticed.

Keywords: Sustainable University, Knowledge Based, Sustainable Development, Knowledge Based Economy.

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Introduction

The world is becoming a more complex world, and these constant changes require human lifestyles (Gerso and Ipina, 2017). Sustainable development is one of the biggest challenges of the 21st century. Universities can be involved in sustainable development in many ways (Ulusf, 2017). Sustainable university arises from the paradigm of sustainable development and oversees the balanced economic, social and environmental development of societies. It can be said that a sustainable university is a university whose philosophy is based on the essence of rationality and systemic thinking, using the interdisciplinary approach in education and research, to identify and solve the daily economic and social problems of human societies. The end result is the realization of sustainable development for current and future generations (Malekinia et al., 2014). A sustainable university is defined as an institution of higher education that strives at a regional or global level to minimize the negative environmental, economic, social and health impacts of its use of resources and its teaching, research and research functions. Achieving participation and oversight is one way to help the community make the transition to sustainable styles (Hurdijk, 2014). Universities are recognized as the main hubs of cities for environmental innovation and education, and this is a valuable opportunity to activate the necessary generational behavioral changes toward sustainable

attitudes in daily life (Jackson, 2011). Which are characterized by economic activities and support the long-term sustainability of the environmental and social structure. The concept of sustainability will affect all areas of the university from the classroom, laboratory, transportation to other services available on campus (Permatasari and Tinduan, 2016). And education is the best hope of humanity and the most effective tool in the pursuit of sustainable development because education is a means to enhance knowledge and develop skills in improving moral values and changing human lifestyles and to support these fundamental changes. And fundamentally shows the path that leads to solving problems and overcoming them (UNESCO, 2016). On the other hand, universities are not only considered as suppliers and producers of human resources and industry-ready workers. Rather, they are known as the place of entrepreneurship that strategically position themselves as engines for sustainable economic growth and technology development (Mohar et al., 2009).

Institutions and especially institutional innovations can be considered as one of the practical and principled concepts in development strategies (Taqvae Yazdi et al., 2017). Knowledge-based economics is a new concept in economic development ideas. In fact, knowledge-based economics is a complementary form of information economics and weightless economics (Raninko, 2012). "In a 'knowledge-based

economy', the production, distribution and use of knowledge is the key to growth, prosperity and employment in all sectors." Makes knowledge more prominent in all aspects of economics (Agboola, 2017). The attention of development economists to the role of knowledge in economic growth and development led to the development of theories of growth and development based on the role of human factors. Contrary to the initial idea, they discussed the role of science and technology in economic development in the market economy (Alamkhah and Sadeghi, 2015).

Knowledge-based economy refers to high-tech trade, especially in the field of communication software and virtual services, in which educational and research institutions can participate independently in a country's economy or with the help of them in other sectors of the economy. Act more effectively (Azimi and Barkhordari, 2017).

In a knowledge-based economy, universities, in addition to producing two outputs; Creating human capital to achieve the mission of training and software production, and knowledge to carry out the second mission or the same research, direct presence in economic development is recognized and proposed as the third and new mission of the university (Arroyo Vazquez et al., 2013). Changing the nature of knowledge imposes new requirements on academic systems in relation to society and the knowledge-based economy because

it must enable trained individuals to work with new tools and focus on integrating traditional learning processes in formal-informal institutions. (Sakio et al., 2011). As a result, innovation as part of a knowledge-based economic system can be the result of connections between producers and users who have created an overall innovation system. However, many areas have struggled to transition to a knowledge-based economy because of the lack of links between academia, industry and government, which are essential to support an advanced knowledge infrastructure. Universities in the knowledge economy have changed from knowledge producers to knowledge investors (Iqbal et al., 2011). On the other hand, moving towards a knowledge-based economy is recognized as one of the requirements of countries in the path of economic development. The World Bank identifies four key pillars for a knowledge-based economy, including institutionalization and economic motivation, education, innovation, and the ICT infrastructure in 2015 (Savas and Alkan, 2015). According to Clark in 2001, the more the knowledge-based enterprise uses knowledge in its structure, the more its value is added and the more evolved cycle of growth is created (Entezarian, 2015). A study of countries with higher and more stable economic growth shows that these countries pay more attention to the expansion of knowledge-based industries and the export of knowledge-based goods (Savas and Alkan, 2015). As

success in advanced knowledge-based economies such as the United States and the United Kingdom has been due to their skilled workforce. Therefore, investing in knowledge, skills and learning for all should be the main priority to become a knowledge-based economy (Damanjo and Russell, 2013). To compete in the global economy, developing countries must ensure that higher education systems create a skilled workforce to meet the changing needs of the new knowledge-based economy (Samad et al., 2018). Knowledge-based economics allows developing countries to accelerate their development process without having to go through a time-consuming process of structural change (Savas and Alkan, 2015). In 1997, the Organization for Economic Co-operation and Development (OECD) introduced the concept of knowledge-based economy as one of the five indicators for measuring knowledge-based economy: inputs, flows and accumulations, outputs, networks and learning. In 1999, for the first time, these indicators were used to measure the knowledge-based economy in the member countries of the organization (Ghasemi et al., 2018). In the field of knowledge-based economy size, four important indicators have been presented, which are: APEC Knowledge-Based Economics Index, a quantitative model based on the Harvard Grid World Framework; Malaysia knowledge-based economy perspective, knowledge estimation methodology (Shahnazi et al., 2013). After

reviewing available data for 66 developing countries in 1982, Maris concluded that not only did education have a significant impact on economic growth, but that public investment had less of an impact on economic growth if not accompanied by education investment. (Momeni and Chaharband, 2012). According to Schultz's theory of human capital in 1963, education is considered an "investment" that brings social and private returns by increasing the knowledge and skills necessary for economic development and social progress. In this regard, Kefla also stated in 2010 that economic reasoning focuses on knowledge-based education and education is related to the perceived needs of the global economy. Therefore, the conclusion to be drawn from this theory is that economic growth and development depend on knowledge and human capital (Damanjo and Russell, 2013).

With the studies conducted in the field of the present study in similar cases of research; Al-Khatib et al. (2018) in their study entitled "Presenting a model of sustainable universities for higher education in Iraq" concluded that in order to maintain scientific standards at the university level, belief in human resource development is the first goal to achieve sustainable universities. This important thing can be achieved through education and planning in the universities of educational institutions. Samad et al. (2018) in a study entitled "A framework for evaluating the knowledge-based economy: a special focus on higher education

institutions", while stating the term knowledge-based economy (KBE) as an important strategy for the development of a country, its important role in development Economic processes are addressed. Salem (2017) in his studies examined the role of universities in creating a knowledge-based economy in Saudi Arabia and his studies showed that universities play a very important role in the knowledge-based economy by achieving sustainable growth and development. Van Wienn (2017) in a comprehensive study entitled A Vision of a Sustainable University concluded that despite the contradictory consistent strategies of universities, management, research and education departments, education in each university each with a specific motivation They themselves are moving towards a sustainable university. The results of Banu and Taylor's (2015) research entitled "Universities and the Knowledge-Based Economy: Understanding a Developing Country" suggest that a more integrated education system and delivery of primary, secondary and tertiary education to work with A common goal is essential. Danjuma and Rosley (2013) in a study entitled "Higher Education and the Knowledge-Based Economy to Discuss the Role of Higher Education Institutions in Nigeria's Knowledge-Based Economy in a Changing Economy" show that Nigeria, compared to emerging economies Despite its abundant resources, it has lagged far behind in the development of human capital, and this calls for

more concerted efforts to transform the mono-commodity economy into a knowledge-based one. The results of Iqbal et al.'s (2011) study entitled "Knowledge Economics and University Performance" showed that there is a strong relationship between the university and the identified characteristics and university performance affects the knowledge economy. In Iran, researchers such as Bagheri Majd et al. (2016) in a study entitled "University in the process of sustainable development of the resistance economy." The results show that there is no significant difference between the current situation and the desired sustainable development of the resistance economy in universities and the current situation is optimal. Haj Khan Mirzai Sarraf et al. (2016) conducted a study entitled "Comparative study of indicators of knowledge-based economy and the role of higher education system in their promotion", and the results show that Iran in a five-year period between 2012 and 2016 After two years of downgrade, for three consecutive years, has experienced growth in these indicators. The results of Pourkarimi (2014), entitled "Entrepreneurial University; Fears and Hopes in the Knowledge-Based Economy", indicate that despite the concerns about changing the role of universities in the knowledge-based economy, the strength of hopes is greater and Recent developments also show a rapid move towards an entrepreneurial university and an approach to commercializing academic research achievements.

The results of the study of observers and Islamifar (2010), entitled "Knowledge-Based Economics and Sustainable Development", which examined the knowledge-based economy and sustainable development and designing a model based on international standards, showed that this study to design and adjust a model Macro-analysis examines the relationship between knowledge-based knowledge and economic development. The results of Jafari and Ahmadi (2010) research, entitled "Study of the role of higher education in the knowledge economy", which was conducted to investigate the role of higher education in the knowledge economy and provide an appropriate model; Higher education can be effective in the knowledge economy through ten main components (entrepreneurship and technological innovations, formation and strengthening of intellectual and human capital, cooperation between academia and industry, knowledge management, policy-making and strategic planning, capital infrastructure, Infrastructure and Development, Information Management, Electronic Infrastructure, Intellectual, Institutional and Structural Transformation, Legal and Legal System Supporting and Encouraging Intellectual Assets). Today, many organizations as well as educational centers in the country that discuss the production of science and economics based on the production of science, have paid special attention to sustainable

economic development. One of these centers is the Islamic Azad University of Mazandaran, which is equipped with 14 university units, with a total of 48,000 students studying in these centers at different times. Due to the special policy of the Board of Trustees of the Azad University on the economy based on the production of knowledge through the knowledge economy, active and successful knowledge-based companies in this group are engaged in the production of science and its supply to domestic and international markets. By observing the structural relationship between knowledge-based economy and sustainable development, these centers seek to provide economic opportunities and benefits to make the most of this phenomenon.

The main purpose of this study is to present the model of a sustainable university and its relationship with the knowledge-based economy in Islamic Azad universities of Mazandaran province. Presented in the combination of sustainable development in different universities of Iran, to determine the relationship between the dimensions of sustainable university and knowledge-based economy and determine the share and degree of appropriateness of the proposed model and be expressed in the form of a general model. In the end, based on the findings and results of the research, practical suggestions for a sustainable university are presented.

Methodology

The present research is a descriptive-survey research method. The purpose of this research is to identify the conceptual model of a sustainable university and its relationship with knowledge-based economy in free universities of Mazandaran province. The present study is from the perspective of how to collect information in the exploratory mixed research group in both library and field (researcher-made questionnaire). Sustainable university is considered as an independent variable and knowledge-based economics as a research-dependent variable. Research data analysis consists of To investigate the relationship between a sustainable university and its dimensions with the knowledge-based economy in Islamic Azad universities of Mazandaran province, we use correlation analysis, the table below shows the results of this analysis. As we know, the main purpose of this study is to present a model of the impact of factors affecting a sustainable university on the development of factors affecting the knowledge-based economy in the free universities of Mazandaran province. To conduct this research, the researcher has used two questionnaires, of which to measure the variables used,

two parts; Descriptive statistics (demographic indicators, including frequency tables and histograms, were performed by SPSS software) and inferential statistics (in order to prioritize the components of a stable university, the Analytic Hierarchy Process (AHP) method). To investigate the relationship between research variables and model presentation, the researcher will use AMOS software. Finally, after performing the above cases and steps, the results, suggestions and solutions for exploitation are presented to the exploiters.

Research Findings

the questionnaire of factors affecting the sustainable university and the questionnaire of factors affecting the knowledge-based economy of both researchers and based on the standard process and based on one Qualitative analysis was extracted and then standardization steps were performed during the quantitative research. To examine the relationship between a sustainable university and its dimensions with the knowledge-based economy in Islamic Azad universities of Mazandaran province, correlation analysis has been used, Table 1 shows the results of this analysis

Table 1: Sustainable university correlation coefficients and dimensions related to factors affecting knowledge-based economy

Variables	Knowledge-based economy		Results
	The correlation coefficient	p-value	
Academic financial resources	0.553	0.009	It is meaningful.
Human resources and intellectual capital	0.480	0.009	It is meaningful.
Physical and infrastructure resources	0.333	0.009	It is meaningful.
Social commitment	0.447	0.009	It is meaningful.
Green environment management	0.510	0.009	It is meaningful.
Social interactions	0.424	0.009	It is meaningful.
Management factors of actions	0.5480	0.009	It is meaningful.
Legal contexts	0.410	0.009	It is meaningful.
Technological substrates	0.284	0.009	It is meaningful.
Awareness strategies and programs	0.351	0.009	It is meaningful.
Entrepreneurship support	0.349	0.009	It is meaningful.
Customer relationship management	0.347	0.009	It is meaningful.
Satisfaction of students	0.389	0.009	It is meaningful.
Commercialization of research	0.341	0.009	It is meaningful.
Creating value for stakeholders	0.545	0.009	It is meaningful.
Resource supply and guarantee system	0.598	0.009	It is meaningful.
Social responsibilities	0.604	0.009	It is meaningful.
University leadership	0.559	0.009	It is meaningful.
Supporting entrepreneurship and commercialization	0.570	0.009	It is meaningful.
Marketing	0.612	0.009	It is meaningful.
Sustainable University	0.716	0.009	It is meaningful.

Source: Researcher Findings

As can be seen, the correlation coefficient between the variable of sustainable university and the variable of knowledge-based

economy is equal to 0.716, which is significant at the level of 0.01, in examining other dimensions of sustainable university with

knowledge-based economy, which is All dimensions have a significant and positive correlation. The highest correlation is related to marketing with a correlation coefficient of 0.612.

In order to investigate the effect of factors affecting the sustainable university on the factors affecting

the knowledge-based economy, as shown in Table 2, the standard path coefficient of the variable factors affecting the sustainable university on the factors affecting the knowledge-based economy is equal to 0.69 The value of t is equal to 7.625 and the value of P-value is less than 0.05.

Table 2: Path analysis of the model of the impact of factors affecting a sustainable university on factors affecting the knowledge-based economy

direction	Standard coefficients	Values t	P-Value	Results
Factors affecting a sustainable university Factors affecting a knowledge-based economy	0.69	7.625	0.0009	It is meaningful.

Source: Researcher Findings

In order to investigate the relationships between the dimensions of factors affecting a sustainable university on factors affecting knowledge-based economy in the special model of the first research, as shown in Table 3, the standard path coefficient of the variable supply system and resource guarantee on factors affecting knowledge-based economy , Equal to 0.62, the value of t is equal to 4.933 and the value of P-value is less than 0.05, the result that, from the perspective of those present in the study, the system of supply and guarantee of resources on the factors affecting the knowledge-based economy has a significant effect It has a positive effect.

The standard path coefficient of the social responsibility variable on the

factors affecting the knowledge-based economy is equal to 0.50, the value of t is equal to 4.329 and the value of P-value is less than 0.05. Social responsibilities have a significant and positive effect on factors affecting the knowledge-based economy.

The standard path coefficient of the university leadership variable on the factors affecting the knowledge-based economy is equal to 0.37, the value of t is equal to 3.316 and the P-value is less than 0.05. The university has a significant and positive effect on the factors affecting the knowledge-based economy.

Table 3: Analysis of the model of the impact of factors affecting a sustainable university on factors affecting knowledge-based economy

routes	Standard coefficients	Values t	P-Value	Results
Resource supply and guarantee system	0.62	4.933	0.0009	It is meaningful.
Social responsibilities	0.50	4.329	0.0009	It is meaningful.
University leadership	0.37	3.316	0.027	It is meaningful.
Supporting entrepreneurship and commercialization	0.49	3.503	0.0009	It is meaningful.
Marketing	0.79	5.002	0.0009	It is meaningful.

Source: Researcher Findings

The standard path coefficient of the variable of supporting entrepreneurship and commercialization on the factors affecting the knowledge-based economy is equal to 0.49, the value of t is equal to 3.503 and the value of P-value is less than 0.05. In research, supporting entrepreneurship and commercialization has a significant and positive effect on factors affecting the knowledge-based economy.

The standard path coefficient of marketing variable on the factors affecting the knowledge-based economy is equal to 0.79, the value of t is equal to 5.002 and the value of P-value is less than 0.05. Factors affecting the knowledge-based

economy have a significant and positive effect.

In order to study the relationships between the components of factors affecting a sustainable university on the factors affecting the knowledge-based economy, as shown in Table 4, the standard path coefficient of the variable university financial resources on the factors affecting the knowledge-based economy is equal to / 41. 0, the value of t is equal to 3.887 and the value of P-value is less than 0.05, the result that, from the perspective of those present in the study, academic financial resources have a significant and positive effect on factors affecting the knowledge-based economy.

Table 4: The effect of factors affecting a sustainable university on factors affecting the knowledge-based economy

routes	Standard coefficients	Values t	P-Value	Results
Academic financial resources	0.41	3.887	0.0009	It is meaningful.
Human resources and intellectual capital	0.31	3.051	0.0009	It is meaningful.
Physical and infrastructure resources	0.00	-0.049	0.961	It does not make sense.
Social commitment	0.24	2.367	0.018	It is meaningful.
Green environment management	0.30	2.998	0.003	It is meaningful.
Social interactions	0.23	2.241	0.025	It is meaningful.
Management factors of actions	0.37	3.598	0.0009	It is meaningful.
Legal contexts	0.17	1.794	0.073	It does not make sense.
Technological substrates	-0.03	-0.334	0.739	It does not make sense.
Awareness strategies and programs	0.19	1.962	0.049	It is meaningful.
Entrepreneurship support	0.19	1.851	0.064	It does not make sense.
Commercialization of research	0.21	2.173	0.030	It is meaningful.
Creating value for stakeholders	-0.13	-1.359	0.174	It does not make sense.
Customer relationship management	0.33	3.417	0.0009	It is meaningful.
Satisfaction of students	0.57	4.895	0.0009	It is meaningful.

Source: Researcher Findings

The research results showed:

- Standard path coefficient of variables of academic financial resources, human resources and intellectual capital, social commitment, green environment management, social interactions, management factors of actions, strategies and awareness programs, commercialization of research, customer relationship management and attraction Student satisfaction is a positive value and the P-value is less than 0.05, the result that, from the perspective of those present in **Sustainable university model with knowledge-based economy in Islamic Azad**

the study, has a significant and positive effect on factors affecting the knowledge-based economy.

- The standard path coefficient of physical and infrastructure resources variables, legal contexts, technological contexts, entrepreneurship support and value creation for stakeholders is a negative value and the P-value is more than 0.05, the result Factors affecting the knowledge-based economy are not significant and positive.

universities of Mazandaran province

In order to answer the question, what is the relationship between the proposed model and each of the

dimensions of a sustainable university and knowledge-based economy in Islamic Azad universities of Mazandaran province, as shown in Table 5, The value of chi-square statistic in the model is 7842/995, the degree of freedom of the model is equal to

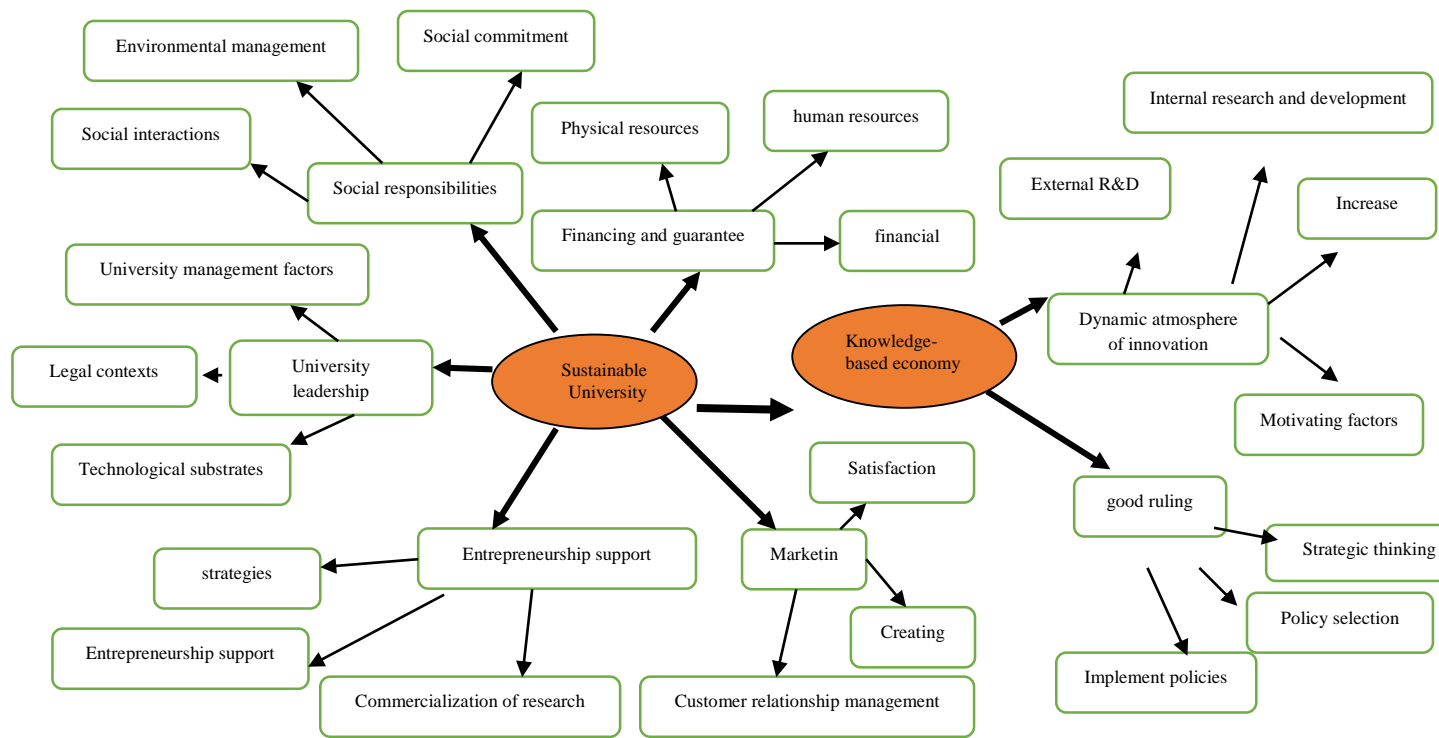
4254, the result of their ratio is equal to 1.844, which is an acceptable value. On the other hand, the fit indices of the main model such as CFI and IFI are all in an acceptable and appropriate level and the SRMR index is 0.117.

Table 5: Fit indicators of the proposed research model

Indicators	Acceptable amount	The amount of research findings	Desirability
K2(χ^2)	-	7842.995	Model approval
P-Value	-	0.000	Model approval
Df	$df \geq 0$	4254	Model approval
χ^2/df	$\chi^2/df < 3$	1.844	Model approval
RMSEA	RMSEA < 1/0	0.049	Model approval
NFI	NFI > 8/0	0.669	Non-approval of the model
AGFI	AGFI > 8/0	0.676	Non-approval of the model
GFI	GFI > 8/0	0.691	Non-approval of the model
CFI	CFI > 8/0	0.814	Model approval
IFI	IFI > 8/0	0.815	Model approval
SRMR	The closer it is to zero.	0.117	Model approval

Source: Researcher Findings

shape1 shows the final model of a sustainable university with a knowledge-based economy in Islamic Azad universities of Mazandaran province.



shape1: Proposed research model

The results presented in table 6 show a significant difference between the experimental and control groups in terms of the posttest scores for dependent variables after controlling the pretest at the level of $p < 0.001$.

Discussion and Conclusion

In the present study, the researcher sought to present a sustainable university model and its relationship with knowledge-based economy in Islamic Azad universities of Mazandaran province. In this research, fifteen factors (academic financial resources, human resources and intellectual capital, physical and infrastructural resources, social

Therefore, the main hypothesis of the current study is confirmed. Accordingly, it can be said that there is a significant difference in the scores of the dependent variables (grammar & vocabulary knowledge) in the posttest.

commitment, green environment management, social interactions, management factors of actions, legal contexts, Technological platforms, strategies and programs of awareness, support for entrepreneurship, commercialization of research, value creation for stakeholders, customer relationship management and student satisfaction), are identified as factors of a sustainable university and Seven factors

(external research and development, internal research and development, increasing the core competencies of resources, motivating factors, strategic thinking to support the knowledge-based economy, selection of policies to support the knowledge-based economy and implementation of policies to support the knowledge-based economy), It is considered as a factor of knowledge-based economy. Research findings showed; From the perspective of research subjects, there is a significant relationship between the dimensions of a sustainable university and knowledge-based economics in Islamic Azad universities of Mazandaran province.

Also, among the factors affecting a sustainable university, there is a significant and positive effect on the factors affecting the knowledge-based economy.

Sustainable university is a new form of university that seeks to meet the new needs of society by modifying their goals, activities and structure. Universities are now expected not only to support economic growth, but also to be directly involved in economic growth through the production of new knowledge and the creation of human capital. In the present study, justice (meritocracy and reward management) was introduced as one of the indicators of knowledge-based economy and it was shown that the factors affecting a sustainable university are effective on the factors affecting the knowledge-based economy. By omission, the present study can be

considered in line with the results of Bagheri Majd et al. (2016). In the present study, an attempt was made to show the relationship and correlation between a sustainable university and a knowledge-based economy. Therefore, it can be said; The research of Haj Khan Mirzai Sarraf et al. (2016) is consistent with the overall result and is in the same direction. In the present study, an attempt was made to show the sustainable university model and its relationship with the knowledge-based economy. Therefore, the research can be considered in line with the research of observers and Islamifar (2010). In the present study, the researcher tries to present a sustainable university model and its relationship with knowledge-based economics. Ignoring the emphasis of the present study on a sustainable university, it can be considered in line with the research of Jafari and Ahmadi (2010). In the present study, by reviewing human resources texts, it has been introduced as one of the fifteen factors affecting the sustainability of the university. Therefore, the result obtained is consistent with the results of Al-Khatib et al. (2018). In the present study, the general results show the relationship between the dimensions of a sustainable university and knowledge-based economics in Islamic Azad universities of Mazandaran province. Therefore, by ignoring the emphasis of the present study on a sustainable university, it can be inferred that the result obtained from the research of Samad et al. (2018) is consistent with the overall

result. In the present study, the general results show the relationship between the dimensions of a sustainable university and knowledge-based economics in Islamic Azad universities of Mazandaran province. Therefore, the result obtained from healthy research is consistent with the overall result of healthy studies (2017). The results of this study are shared with some of the results obtained from Van Wienen (2017). In the present study, the general results show the relationship between the factors of a sustainable university and knowledge-based economics in the studied universities. Therefore, the result obtained from the research of Banu and Taylor (2015) is consistent with the overall result and the third special question. Danjuma and Russell (2013) also emphasize the relationship between higher education and the knowledge-based economy, which is consistent with the overall outcome.

In this research work, the relationship between sustainable university and knowledge-based economy in Islamic Azad universities of Mazandaran province has been investigated and it has been shown that according to the accepted theories in knowledge-based economy, university has always been considered as one of the basic levers. Then, by describing and analyzing the effects and results of knowledge-based economy and its role in the balanced and sustainable development of society in the present era, it is clear that one of the

main manifestations and characteristics of sustainable development is paying attention to the source of science and knowledge production, namely university.

One of the important achievements of this research has been the design and presentation of a sustainable university model in the knowledge-based economy, because we have not had a comprehensive and flexible model in this field before. To achieve such a model, by reviewing the relevant literature, we tried to comprehensively identify and address all the factors affecting a sustainable university and knowledge-based economy, which has been one of the advantages of this study to all similar researches in this field. Another positive feature of this study was the study of the correlation between each of the factors of a sustainable university and the factors of knowledge-based economy. Based on the obtained data and citing the results of research questions, in order to improve and strengthen each of the dimensions, suggestions are presented as follows:

- Improving the system of providing and guaranteeing resources (financial, human and infrastructure) in the university;
- Creating a database of motivated and entrepreneurial staff and faculty members;
- Allocate sufficient funds for the supply and supply of research and laboratory equipment and facilities;

- Establishment of a social responsibility research center at the university;
- Activities of associations and academic organizations in connection with society to create culture;
- Establishment of a Sustainable Development Research Center at the university level by the relevant authorities;
- The need for adherence and commitment of management to sustainability strategies and strategies;
- Implementation of legal materials such as by government officials;
- Laying the necessary groundwork for concluding contracts with governmental and non-governmental organizations and institutions and industries;
- Rethinking the content and teaching methods of sustainability education;
- Publication of research results in prestigious domestic and foreign scientific journals;
- Participation and investment of university units and centers in knowledge-based projects;

References

Al-Khateeb, M, Al-Ansari N, Knutsson, S . (2018) . Sustainable University Model for Higher Education in Iraq, *Creative Education*, 2018, 5, 318-328.- Arroyo Vázquez, M.; Sijde, P.; Jiménez Sáez, F., “Alice in Entrepreneurs' Land: The University Challenge”, *High Technology Entrepreneurship. A Festschrift for Ray Oakey*, pp. 101-112, 2013.

Azimi Naser Ali, Barkhordari Dourbash Sajjad, 2010, Identifying the foundations of the knowledge economy of the Foundation, National Scientific Research Center, Tehran, first edition[in Persian]

Bano Shah & John Taylor, 2015, Universities and the knowledge-based economy: perceptions from a developing country, *Higher Education Research & Development*, Volume 34, 2015 - Issue 2

Bagheri Majd Ruhollah, Seyed Abbaszadeh Mir Mohammad, Hassani Mohammad, Mehr Alizadeh Yadollah and Ebrahim Salehi Omran, 2016, University in the process of sustainable development of resistance economy, strategy, No. 81, year 25, winter 2016, 87-62[in Persian]

Danjuma Ibrahim & Amran Rasli, 2013, Higher Education and Knowledge Economy: A Focus on Nigeria, *Jurnal Teknologi (Social Sciences)* 64:3 (2013), 87–91.

Entezarian Nahid, 2015, The Impact of Knowledge-Based Businesses on the Economic Growth of the Country, *Social, Economic, Scientific and Cultural Monthly of Labor and Society*, No. 180, May 2015, 20-27[in Persian]

Elamkhah Abdollah and Mehdi Sadeghi Shahedani, 2015, A Review of Knowledge-Based Economics Literature; From Formation to Practice, Case Study: A Survey of the Knowledge-Based Economy in Iran, *Quarterly Journal of Technology Growth*, Volume 11, Number 44, Fall 2015, 17-27[in Persian]

Greco, v and Ipiña, n. (2017), The Sustainable University A Model For The Sustainable Organization, Management Of Sustainable Development Sibiu, Romania, Volume 6, No.2, December 2017.

Ghasemi Mohammad, Faqihi Mehdi and Parisa Alizadeh, 2018, Requirements for achieving knowledge-based economy at the macro level: Analysis of the legal framework in Iran and policy recommendations, Quarterly Journal of Economic Research, Volume 18, Number 68, Spring 2018, 152-99. [in Persian]

- Hordijk, I. Position paper on sustainable universities. J. Clean. Prod. 2014, 14, 810–819.

Haj Khan Mirzai Sarraf, Ebrahim; Manijeh Mahmoudi and Maryam Shamsabadi, 2016, A Comparative Study of Knowledge-Based Economy Indicators and the Role of Higher Education System in Promoting Them, A Study of the Situation in Iran, 2012-2016, National Conference on Higher Education System and Resistance Economy, Tehran, University of Science and Technology Culture [in Persian]

Iqbal Muhammad Jawad, Rasli Amran Heng, Low Hock, Hon Tat Huam Bilal Ali, Mohamad Bin & Ibne Hassan, 2011, KNOWLEDGE ECONOMY AND UNIVERSITY PERFORMANCE, INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH, Vol. 3. No. 5. September, 2011, I Part.

Jackson, T. Prosperity without Growth: Economics for a Finite Planet, 2nd ed.; Routledge: New York, NY, USA, 2011.

Jafari Parivash and Amineh Ahmadi, 2010, The role of higher education in knowledge economics in order to provide an appropriate model, Futurology (Management Research), Volume 21, Number 87, Winter 2010, 134-113[in Persian]

Jangani, Samira, Mehrabani Fatemeh and soghra Ghobadi, 2013, Comparison of the effect of knowledge-based economy on economic growth: A case study of Iran and member countries of the Organization for Economic Cooperation and Development, the first national electronic conference on Iran's economy with a national production support approach, December 2013, 24-1[in Persian]

Kah Hoe, Y. (2011). Achieving sustainable campus in Malaysia University. (Master dissertation). Universiti Teknologi Malaysia.

Mohar Y., Saeed M.S. and Leillanie M.N. (2009), “An Integrated Model of a University’s Entrepreneurial Ecosystem”. Journal of Asia Entrepreneurship and Sustainability. Vol. V, Issue 1, pp 57-77.

Malekinia, Emad; Bazargan, Abbas; Vaezi, Mozaffaruddin and Ahmadian, Majid, (2014), Identifying and Prioritizing the Components of a Sustainable University, Quarterly Journal of Research and Planning in Higher Education, Volume 20, Number 3, pp. 26 - 1[in Persian]

Momeni Farshad and Farzaneh Chaharband, 2012, The Institutional Position of Basic Education in Knowledge-Based Development, Science and Technology Policy Letter, Year 2,

Number 1, Winter 2012, 80-67[in Persian]

Nazeman Hamid and Alireza Eslamifar, 2010, Knowledge-Based Economics and Sustainable Development (Design and Test of an Analytical Model with Global Data), Journal of Knowledge and Development (Scientific-Research), Volume 18, Number 33, Winter 2010, 33- 1[in Persian]

Olugbola.A.(2017).Exploring entrepreneurial readiness of youth and startup success components; Entrepreneurship training and a moderator. Journal of innovation and knowledge. Volume 2. issue3.pages 155-171.

Permatasari Paulina & Paulina Tindaon,2016, Integrated Approach Model Towards University Sustainability: Analysis of Best Practices of Sustainable Universities, <https://www.researchgate.net/publication/>

Rannikko, H, (2012), Early Development of New Technology-Based Firms, A Longitudinal Analysis on New Technology-Based Firms' Development from Population Level and Firm Level Perspectives, Hanken School of Economics.

Savas B, E., Alkan, R.(2015). Entrepreneurship Education at Universities: Suggestion for A Model Using Financial Support, Procedia - Social and Behavioral Sciences 195:856 – 861.

Salem Mohamed Imam, The Role Of Universities In Building A Knowledge-Based Economy In Saudi Arabia, International Business & Economics Research

Journal – September/October 2014
Volume 13, Number 5,1047-1056.

Seitzinger, S.P.; Svedin, U.; Crumley, C.L.; Steffen,W.; Abdullah, S.A.; Alfsen, C.; Broadgate,W.J.; Biermann, F.;Bondre, N.R.; Dearing, J.A. Planetary stewardship in an urbanizing world: Beyond city limits. *Ambio* 2012, 41, 787–794. [CrossRef] [PubMed]

Suciu Marta-Christina, Drăgulănescu Irina-Virginia, Ghițiu-Brătescu Alexandru, Picioruș Luciana, Imbrișcă Cosmin, Șerbu Valentin-Matei and Corina Grigore, UNIVERSITIES' ROLE IN KNOWLEDGE-BASED ECONOMY AND SOCIETY. IMPLICATIONS FOR ROMANIAN ECONOMICS HIGHER EDUCATION, *Amfiteatru Economic*, Vol. XIII • No. 30 • June 2011, 420-436.

Steffen, W., Persson, A., Deutsch, L., Zalasiewicz, J., Williams, M., Richardson, K., Crumley, C., Crutzen, P., Folke, C., Gordon, L., Molina, M., Ramanathan, V., Rockstorm, J., Scheffer, M., Schellnhuber, H., J., Sundac, Dragomir .and fatur K,lerena,(2011), “ Knowledge Economy Factors and the Development of Knowledge-based Economy”,*CroEconSur*,Vol .13 , No.1 ,pp . 105-141.

Summad Emad, Al-Kindi, Mahmood, Shamsuzzoha Ahm and Sujana Piya,2018, A Framework to Assess a Knowledge-Based Economy: Special Focus to Higher Educational Institutions, Proceedings of the International Conference on Industrial Engineering and Operations

Management Paris, France, July 26-27.

Shahnazi Ruhollah, Moazen Jamshidi Homa and Nematollah Akbari, 2013, The role and position of knowledge-based economy on the formation of special zones of science and technology Case study of Iranian economy, *Technology Growth*, Year 9, No. 36, Fall 2013, 9-1[in Persian]

Taghvaei Yazdi, Maryam, Niaz Azari, Kiomars and Kalaei Darabi, Reza, (2017), Presenting the model of science and technology growth centers and its impact on sustainable development and technology development with a mediating role of growth and innovation (Case study: Islamic Azad University of Mazandaran), *Journal of Executive Management*, Year 9, No. 17[in Persian]

UNESCO. (2009). Education for sustainable development and climate change, *Policy Dialogue* 4, from:

<http://unesdoc.unesco.org/images/0017/001791/079122e/pdf>, (12 /Jan/2009).

Van Weenen, H. (2000), "Toward a vision of a sustainable university. International", *Journal of Sustainability in Higher Education*, Vol.1, No.1: 20-34.

Weenen, H, (2017), Towards a vision of a sustainable university, *International Journal of Sustainability in Higher Education*, Vol. 1 No. 1, 2017, pp. 20-34.