

The Role of Higher Education Policies in Science Production (Case Study; Graduate Degrees in University)

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Abstract

The present study aimed to investigate the role of higher education policies in science production in postgraduate education. This study was considered causal research in terms of the method used. In the present study, the statistical population of this study includes graduate students of Arak University. Morgan's Table was used for sampling, and the convenience sampling method (also known as availability sampling) was used. The sample size was 323 people. According to the results, higher education policies can positively and significantly affect science production through structuring higher education, subsidy allocation to graduate education, investment in higher education, building culture for higher education, the applicability of higher education, innovation support).

Keywords: Public Policy, Higher Education, Science Production, Graduate Studies

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1. Introduction

Science production is considered the basis of wisdom, and wisdom is known as the basis of ability. Different interpretations, such as "the era of trans-industry", "the age of communication," "the age of science and technology," the "era of globalization," and so on, are used to describe the present time. These interpretations are in common in that science is considered the basis of the development of countries and is more than ever involved in their fate. In other words, nowadays, science is regarded as the driving force, and the most advanced industries can be achieved based on the highest specializations.

Higher education should be considered the responsibility and economic support of governments in public commodity, a strategic requirement for all educational levels, and a context for research, innovation, and creativity. Investment in higher education has not been essential to creating a

widespread and diverse knowledge society and advancing research, innovation, and creativity (UNESCO, 2009).

Science and knowledge are produced only through research, which is considered the main task of the university and research centres. Sustainable development This introduction provides a suitable context for technology and, consequently, the generation of employment and wealth. It is based on knowledge and science because science production leads to increased learning. It ultimately enhances comfort, ability, and social security. Universities have different and vital duties such as training specialists to strengthen the foundation of development, cultural development and according to the temporal conditions and social, economic and technological needs related to that time. Hence, keeping public culture alive to compete in international arenas is based on the quality of the academic system and the interactions that take place in it. Also, upgrading the community's value system within its specific temporal and spatial framework depends on the educational system, scientific productions, and dissemination at the macro-level of society.

Since educational investment is helpful in the long run, ten to fifteen years are needed to train a person who can be valuable and practical for fifty years or more for their community. This realization depends on passing a university course where the individual can achieve acquired speciality and efficiency. On the other hand, university education is considered the basis for developing and exploiting potential resources in any society and plays a crucial role in economic growth and social development (Doroodi, 2017).

In different countries, "higher education" is associated with accumulating science, research and culture. The presence and activity of the academic educational institution in a good society are considered a significant development in the science extension, fundamental analysis, and substantial changes in various economic, social, political and cultural fields in any developed and developing society. Higher education is considered as the highest and last stage of the educational system, or in other words and the head of the training pyramid in each country. Higher education refers to studying in courses after graduation from high school, leading to assistant, bachelor, master and PhD degrees (Madhooshi and Niazi, 2010).

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Higher education refers to studying in courses after graduation from high school, leading to assistant, bachelor, master and PhD degrees of evaluation and transparency, and accountability, the case of value-added also considered reasonable reasons for allocating resources to higher education to higher education implicitly as the requirements of attention to evaluation (Hatami et al, 2011).

The country's higher education system is formed as an organization aimed to provide needed contexts for the optimal implementation of all the programs and tasks related to higher education and increasing the efficiency of higher education. According to the 20-year Perspective of the country, the following goals are considered for higher education: excellence and progress of the country in the

field of science and technology and international relations by promoting research and access to the knowledge boundaries and deepening of religious values, the development of higher education in the country by maintaining quality and based on justice for public access, training of specialist forces for achieving scientific and executive responsibilities of the country and strengthening the relationship between university and industry and super Perspective, support and guidance in universities and scientific policies (Abtahi and Torabian, 2011).

Nowadays, perhaps you can claim that science plays the most crucial role in promoting human society; the contemporary world is composed of science and thought, and with any means other than information cannot be lived in a world of knowledge and information (Gharavi et al., 2012, 4).

In other words, science and its production are considered the basis of today's civilization. It continues its vital process concerning other realities of society. Nowadays, all developed or developing countries pay attention to science and technology as the main focus of development activities to maintain or create the foundations for development and improve their competitive power with other countries (Mahmoudzadeh, 2011, 2).

Hence, the boundary between advanced and backward societies depends mainly on their scientific productions in the world (Fazlollahi and Maleki Tavana, 2011, p.112). Science and knowledge production is considered the basis of wisdom, and wisdom is the basis of ability. If power was measured by force, nowadays, wisdom is regarded as the power criterion. The one with more wisdom is more potent to the extent that the experts believe that only knowledge-based development and scientism are sustainable developments (Godazgar and Alizadeh, 2011).

A country's high scientific power plays a vital role in the pride of its people, and such people do their best to grow their place. It can be concluded that science has the power of unifying people and maintaining independence in a country. To convert science to a value in society, public culture must consider science as a tool for solving problems and scientific management as the best tool to solve those problems. Science plays an essential role in the present and the future of the country. If science is developed and compelling, access to social justice, liberty, competent management and meritocracy and human and social rights are provided as the primary goals (Fazlollahi and Maleki Tavana, 2011).

Public policies in higher education can guide the production of science in a country. These policies have different dimensions and can play a role in the production of science through universities in different ways. The main question of this research is how public policies can play a role in the production of science through universities? How do public policies play a role in higher education in the production of science?

2. Literature Review

Nowadays, the term "science production" has achieved a special place in the country's literature. The movement for science production and the software movement has attracted much attention from many policymakers and scientific planners in the country. In scientometric evaluations, the degree of participation in the production of science, innovation, technology and, in general, participation in the development of world science is considered the most critical criterion for determining the scientific status and ranking of countries. The subject of science production was first introduced at Tehran

University in 1987. Still, it was not attracted much attention, and only its basis was formed. In 1993, this issue was raised and defined more seriously. This year, the University of Tehran announced that authors whose articles in international journals published by reputable indexing agencies, such as the ISI, will receive significant prizes. It was the first step for serious action in science production. Since 2000, science production has been introduced in the Ministry of Science, Research and Technology research field, and it has been announced that significant amounts are allocated to each article published in ISI. In recent years, credible international articles have become a prerequisite for recruiting faculty members (Shafizadeh, 2009, p. 51).

On the other hand, the slogan "Scientific development; the condition for survival" was introduced in 2001 by the national scientific community at the national level. Then, the structural changes project of the Ministry of Science was developed. Then the fourth development plan of the country was implemented with the "knowledge-based development" approach aimed at implementing this slogan.

Also, the 20-year perspective document promoted science production by introducing the slogan of converting to the "first power of the South-West Asia Region in the fields of scientific and economical" to the level of a national aspiration (Shafizadeh, 2009, 52).

Science production is considered the most reasonable and reliable index to measure countries' scientific rank and position. The number of scientific articles published in prestigious international journals is regarded as one of the most essential criteria for science production to develop by exact calculations without any manipulation. In addition, scientific standardization, particularly the production of reputable scientific journals and indexing them at international institutions, is of utmost importance because science production is not limited to basic sciences and covers all scientific branches, including the humanities. In the following, different definitions and views on the science production to further clarify its aspects:

- a. Science production means a critical theory, method, or achievement which introduces global issues and be published in a reputable international publication after specific judgment, and indexed in science production institutions as ISI and be available to others (Mousavi, 2003, 3).
- b. Science production refers to knowledge that has not been existed but created, thought and opinion that has not existed but has been presented and accepted by scholars. This issue is proven after obtaining approval and documenting by a scientific and specialized organization. According to this definition, copying, assembling, and imitating parts are not considered science production.
- c. Science production refers to the process of content compilation and article compilation and achieving a new and unknown concept (Sobuti, 2006).
- d. Science production can be defined as a theory for a detailed understanding of phenomena to solve social problems. Science production in each scientific field begins with a problem (Zakir-Salehi, 2003).
- e. Science production refers to longitudinal motion in line with expanding the boundaries of human knowledge and moves constantly forward.

- f. Science production is a regular activity that promotes human knowledge, and a scientific theory is obtained as a result of innovation by answering the questions raised in the research (Heidari and Heidari, 2005, 120).
- g. Science production refers to creating and introducing something that has not been raised so far. Therefore, when scientists present a new theory dealing with phenomena, science has been produced (Shariatmadari, 2005, 9).
- h. Science production is the last and highest stage in science. Science production means the theorization, which ends in creation (Mahdavi, 2005, 17).

In general, any attempt to identify the world's unknowns is known as an attempt to produce science. Produced science is valuable when not to be forgotten after production. However, it must also be provided to interested people for evaluation and criticized by experts and used by various users. Also, the supply of produced science will prevent repetition and repeating by other endeavours in the world of science, and more importantly, the basis for further scientific searches. According to the characteristics of science (acquisition, transfer and application), it can be concluded that science is produced through research and the transfer of its findings, and then after the supply will help the needs of society.

Therefore, science is produced when this science is most used to solve the problems of communities. Science production is the same as the production of the product; if all efforts are made to produce the best product, but only to remain on the tree and not to be used, it will indeed be destroyed.

In Iran, science production faces a significant challenge in both software and hardware fields. The most important of these challenges can be summarized as follows: scientific development equivalent to the publication of the paper (www.korsi.ir), weakness in the system and academic activities (Shafizadeh, 2009, 70), lack of willingness to do teamwork, non-allocation of enough credits (Mousavi Movahedi, Kiani Bakhtiari, and Khan Chamani, 2006, 28), the gap between production and practice, psychological weakness and lack of internal motivations (Shafizadeh, 2009, 73). Also, another fundamental problem is the cultural problem that our country has faced for many years, and its results are still visible. Some of these problems include movement from empiricism to rationalism, the structural weakness of the educational system, the low attitude toward religious aspirations and the implicit penetration of Western culture (Ghasemizad, 2007, 79).

There are many problems with science production in Iran, which is due to the structure of higher education and its related mechanisms. Some of the most important ones are the lack of coordination, inter-parts and intra-parts collaboration and cooperation, in line with scientific and cultural goals, the structural weakness of the educational system and and higher education in meeting the real needs of the country and lack of proper preparedness according to technological changes, the involvement of elites and owners of thought with livelihood problems and lack of facilities and amenities, ignoring the respect principles and the spirit of gratitude from its experts (Sadeghi Reshad, 2007; Ghasemizad & Ranjbar, 2010), poor attitude toward religious aspirations and the implicit penetration of the culture of imitation, irreducibility, consumerism, and western culture, the passion for conducting individual studies, bureaucracy and building obstacles in attracting and using the country's scientific elites, the pursuit of cultivation and neglect of attention to the scientific spirit and the search for the primary orientation of the universities, insufficient access to international sources and journals, the

weakness of the culture of " Consumption "and" work "and" self-control "in many sectors of society, lack of attention to the establishment of scientific management in different departments of the country's administration (Ghasemizad, 2007).

On the other hand, the factors affecting science and technology products must be identified, and many efforts must be made to overcome its barriers. Establishing and strengthening the scientific-based culture in society, human resources development as a pillar, graduate and postgraduate degrees development, providing scientific resources, journals, books, scientific databases for achieving the background of research, the development of workshops and laboratories, quantitative and qualitative development of research of domestic journals and attempts to internationalize them in such a way that, in addition to the ability to publish articles of trained researchers, they also receive reports from foreign researchers; also having scientific standards and specifying the minimum expectations of each individual according to their positions, and, finally, wise management, scientific policy-making and accurate monitoring can be effective in the science production, the absence of any of these factors can prevent the science production (Zulfi Gol, 2008).

According to the results of the research background review, although similar studies were not obtained, it was concluded that several studies have focused on the issue of science production and its related problems. Nowroozi et al. (2015), during their research entitled "Investigating the barriers of science production from the perspective of faculty members of Shahid Beheshti University", concluded that faculty members believe that the cultural-social barriers, communication barriers, educational barriers and individual barriers at high levels are practical on science production. They are more important than others, among which the following obstacles are considered as the most essential items related to the mentioned obstacles: slogans in the attraction and maintenance of elites, the lack of coherent and organized links between universities and research centres; education based on the transfer of knowledge rather than promoting creativity, innovation and entrepreneurship; overcoming quantitative view and insufficient attention to the quality of research activities.

Bagheri et al. (2016) during their study entitled "An Analysis of Structural and Behavioral Factors Affecting the Promotion of the Culture of Science Production in Universities of the Country; Case Study: Shiraz University", concluded that 13 factors affecting the promotion of the culture of science production in two categories of structural (creating coordination between different scientific and research sections of universities, continuous improvement of educational contents, avoidance of apoliticism and managers' instability, targeted planning on promoting the culture of science, ongoing communication between academic and research centers in and out of the country, attention to the quality and applicability of studies in solving the problems of society, the development and implementation of an integrated talent management system in the higher education system, providing and developing research facilities and behavioral) (creating the right culture of critique and criticism, creating a demand-related culture in the university, promoting free-thinking in the university, aligning education and research, and observing educational and research standards). According to the results, universities must pay attention to structural and behavioural factors to promote the culture of science production and try to implement them.

Hatami et al., (2011) during their study entitled "Structuring Challenge for Quality Monitoring and Evaluation in Iran's Higher Education", concluded that evaluation and accountability to achieve the

goals and excellence of the performance of higher education systems had become the core issue of the higher education field. It can be acknowledged that all relevant stakeholders in the higher education system emphasize the use of evaluation mechanisms. Still, the goals and procedures of evaluation are considered as the vital point in this regard. In line with the importance of assessment and improving the quality of higher education, the present study was carried out aimed to review the evaluation background in the higher education system of Iran and, consider international experiences in this field, and its principles and characteristics, and investigate the evaluation approaches and measures done and provide an analysis of the status quo. Also, given that the establishment of quality assurance network structures in higher education has attracted much attention of researchers in recent years, and since the higher education system of Iran is composed of distinct sub-systems, the network structure is emphasized in drawing the most favourable conditions for evaluation structure and quality assurance in Iran's higher education.

Abtahi and Torabian, (2011) during their study entitled "Investigating the Realization of Higher Education Objectives Based on the 20 Years Perspective Document by (Analysis of Hierarchy Process) AHP Approach", concluded that the higher education system of the country is formed as a necessary organization aimed to provide the implementation of all programs and to perform the duties of higher education and increasing higher efficiency of the higher education system. According to the 20-year Perspective of this country, the following goals are considered for higher education: excellence and progress of the country in the field of science and technology and international relations by promoting research and access to knowledge boundaries and deepening religious values, expansion of higher education in the country by maintaining quality and based on justice for universal access, training of specialist personnel for the achievement of scientific and executive responsibilities of the country and strengthening the relationship between university and industry, and super Perspective, support and guidance in universities and scientific policy-making for higher education. In the present study, the country's higher education system is first introduced. Then the Hierarchical Analytical Model (AHP) is addressed for higher education and, finally, the factors and criteria affecting its goals.

Madhoushi and Niazi, (2010) during their study entitled "Investigating and explaining the status of Iran's higher education in the world", investigated and explained the status of higher education in Iran compared to other countries in the world. In this regard, the level of higher education in Iran and 31 countries in different dimensions was analyzed using the UNESCO database. Excel software was used to do this. According to the results, Iran's higher education status is relatively unfavorable compared with the advanced countries. It is relatively equal and higher compared to the developing countries and the Middle East countries.

Saa'd et al., (2015) in their study entitled "The Role of Higher Education in National Innovation and Knowledge Performance", investigated the role of the higher education system in the production of national innovation. These researchers emphasized the institutional diversity of the higher education system and its impact on national innovation systems. For this purpose, four critical elements of higher education size, investment in higher education, subsidies paid for higher education, and the relative support of higher education activities and their relationship with national innovation performance have been investigated. According to the results, there is evidence for higher education

policymakers that they have emphasized increasing access to investment in higher education and reducing subsidies to it.

Yonezawa et al. (2020), in their study on the evolution of knowledge production policy in Japan and focusing on interdisciplinary research universities, examined the role of higher education policies in the transition from discipline-based academic tradition to multidisciplinary forms of knowledge production. They realized that a new restructuring towards the hybrid model had to take place. Using interviews with key stakeholders, this study identified that the internal dynamics of this transition process include barriers and opportunities. In this study, examples of Japanese higher education are presented according to which universities should be restructured towards composite and mixed institutional forms. Higher education policies, therefore, should lead universities to restructure.

Higher education policies can play a crucial role in the production of science and the development of technology in various fields by providing a framework and determining the path to the future. Powell and Dusdal (2017) examined the role of universities and research institutes in science, technology, engineering, mathematics, and health through a comparative study of science production in Germany, France, Belgium, and Luxembourg. Based on comprehensive historical data from 1900 to 2010, this study examined the dynamic and static patterns of scientific production and productivity in these countries.

Saedmoucheshi and Azizi (2020), in a study, have examined the quantitative and qualitative aspects of policy-making in the Iranian higher education system. They have identified that the most critical challenges of higher education in Iran, the loss of human and financial capital due to the quality of university output, lack of comprehensive monitoring system, evaluation and accreditation of higher education, lack of dynamism in meeting the needs of society, low-level Skills are entrepreneurial, creative and innovative. Policy-making in these areas can be an excellent way to overcome these challenges.

The factors related to the research subject can be extracted according to figure (1) after reviewing theoretical literature. Part of the factors is extracted from Bagheri et al. (2016), and part of the components is removed based on the study conducted by Saa'd (2015).

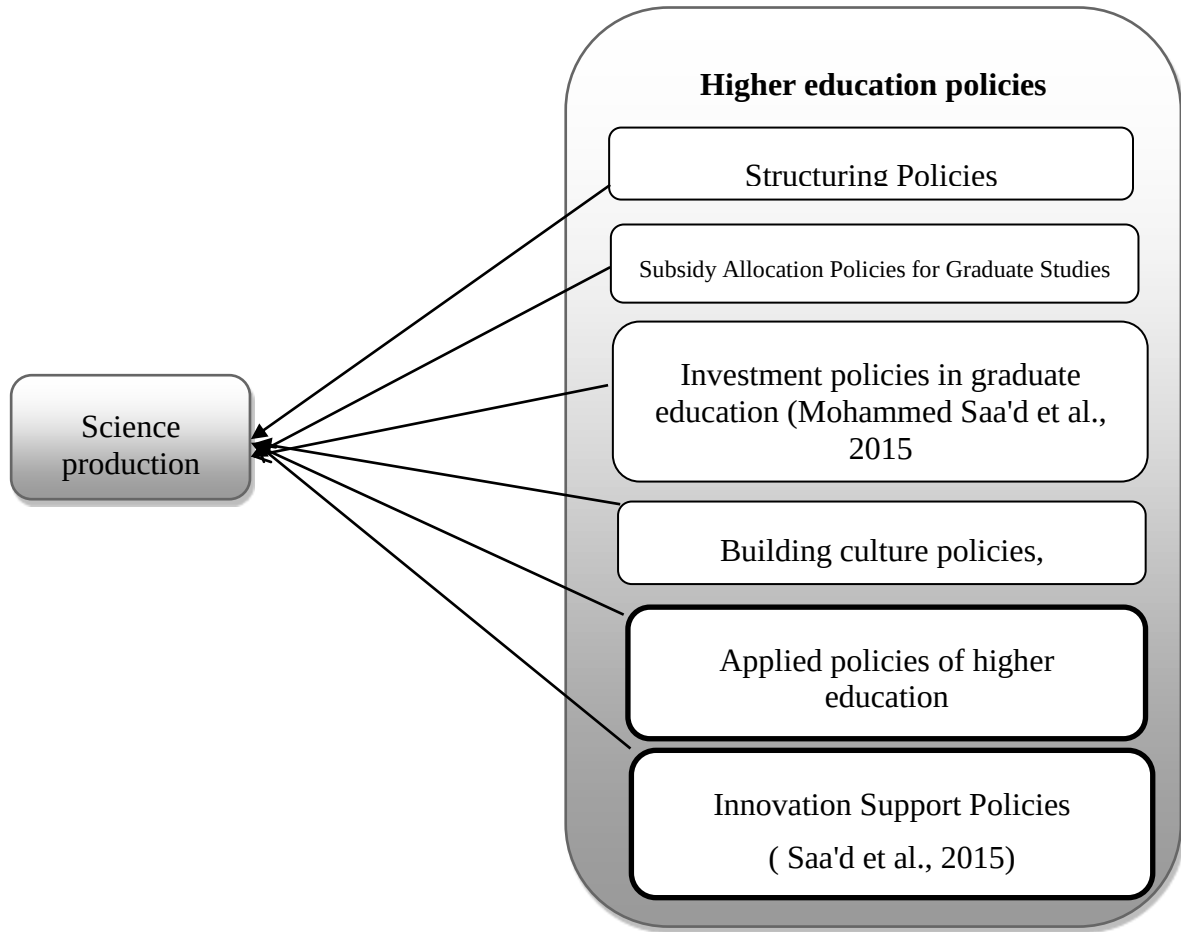


Fig. 1 Conceptual model of research (Bagheri et al., (2016) and Saa'd, (2015).

As shown in Fig. 1, there are a central hypothesis and six sub-hypotheses for this study, including:

The central hypothesis: higher education policies have a positive and significant effect on science production.

Sub-hypotheses:

1. Structuring higher education policies have a positive and significant effect on science production.
2. Subsidy allocation for graduate education policies has a positive and significant effect on science production.
3. Investment in graduate education policies has a positive and significant effect on science production.

4. Building culture for higher education policies has a positive and significant effect on science production.
5. Applied higher education policies have a positive and significant effect on science production.
6. Innovation Support Policies have a positive and significant effect on science production.

2.1 Indicators of Variables

According to the resolution of the 550th session of the Supreme Council of the Cultural Revolution, the indicators for evaluating Iran's higher education policies for universities, the indicators related to the independent variables of this research were extracted as follows (Iranian Presidential Office, 2004):

1. Structuring policies: types of universities (public, private, applied science, Payame Noor, free), university grading (comprehensive, very large, large, medium, small, center), type of management (self-government, board of trustees, Dependent, centralized, regional, national).
2. Policies for allocating subsidies to graduate students: research funding, educational subsidies, cultural subsidies.
3. Investment policies in graduate education: development of fields, development of courses, development of centers, increase in the number of students, prioritization of investment through land management.
4. Culture-building policies: culture of entrepreneurship, culture of questioning, culture of demanding, culture of theorizing, culture of seeking science.
5. Policies to be applicable higher education: the relationship between university and industry, the central issue of higher education.
6. Innovation support policies: development of growth centers, entrepreneurship development, development of start-ups, establishment of science and technology parks.

Also, for the dependent variable, i.e. the variable of science production, there are various indicators, among which, the following indicators were determined.

1. Hirsch Index (H-Index): This index was presented in 2005 by Hirsch to measure the scientific-research output of researchers individually (Hirsch, 2005). H-index in terms of simplicity, ease of use and having many advantages over other methods has received more attention from researchers. This index can be used to answer the question of what role each researcher alone has in the development of different fields of science. The H index only includes articles with a citation number of H or more. A researcher's H index includes the H number of his papers, each of which has been cited at least H times.
2. M-Index: Hirsch index of each researcher depends on the duration of his research activity. Because over time, the number of articles and citations to it increases. Therefore, to compare researchers in different stages of their activities, the M index was introduced (Egghe, 2006). This parameter is obtained as a result of dividing each researcher's Hirsch index by his scientific age. Scientific age refers to the number of years that have passed since the publication of his first article.
3. G-Index: This index was proposed in 2006 by Leo Geh to quantitatively measure the scientific output of researchers (Egghe, 2006). One of the most important drawbacks of the H index is that although in scoring a set of scientific activities of an individual, journal,

university and country, the lack of citation of an article does not affect its ranking, but in the same proportion, this index does not cite highly cited articles, and such articles do not have a significant effect on the H index to improve the researcher index. H suggested the G-index. The G-index, using the square of the number of articles and comparing it with the sum of citations in calculations, actually highlights a researcher's highly cited articles.

4. **Y-Index:** The Y-Index is used to assess the share of publications by authors, institutions and countries. This index is related to the number of first author publications (RP) and responsible author publications (FP). The Y index consists of two parameters: publication performance, j , which is related to publication quantity, and publication personality, which determines the ratio of responsible author publications to first author publications (Hui-Zhen, 2012; Yuh-Shan, 2014).
5. **Mathew-Value:** One of the new scientometric indicators introduced by Mathew in 2006 (Mooij, 2006). In fact, it is a modified form of the impact factor that calculates it over a five-year period on a specific topic. How to calculate it is to divide the number of citations to articles of a journal in a five-year period by the number of articles of the same journal in the same period of time when the resulting number is measured with the same ratios in the entire field.
6. **π -Index:** Index calculation methods typically use data related to all articles. However, scientific progress can be attributed to highly cited publications. Therefore, a new index called the foot index was proposed for comparative evaluation of scientists active in similar scientific fields. This index was presented in 2009 by Winkler (Vinkler, 2009).
7. **Tenth index (10i-Index):** This index indicates the number of articles published by an author, each of which has been cited at least 10 times. This index was presented and used in 2011 in Google Scholar database.

3. Research Method

The present study is considered causal research because it uses the statistical technique of structural equations to investigate the causal relationship between variables. But this study is regarded as applied research in terms of purpose because it uses theories and some behavioural and managerial sciences and statistics about the statistical society to achieve results for those organizations and institutions considered members of the statistical community. The results are helpful and can be used for these organizations.

In the present study, the field method has been used to collect information about the research hypotheses test. Also, a five-point Likert scale questionnaire is used to measure indicators, which the form of scoring the scores of the questionnaire is as follows:

1. I strongly disagree. 2. I disagree. 3. I have no idea. 4. I agree. And 5. I fully agree

A logical method, content branch, was used to investigate the validity and reliability of the questionnaire. In this case, the quantity and quality of the questions are studied from the Perspective of professors. In this regard, the supervisor view has been used to investigate the validity of the research questionnaire, to achieve content validity. Also, it has tried to evaluate and analyze the questionnaire using expert opinions in the subject area. Finally, a final questionnaire was developed

and distributed on a broader scale after applying the view of the professors and correcting the questionnaire. Also, Cronbach's alpha was used to measure the questionnaire's reliability. After distributing a sample of 30 and using SPSS software, the value of 0.763 was obtained, which, compared with the 0.70, shows that the questionnaire has sufficient reliability.

In this study, the statistical population includes postgraduate students of Arak University. During the present study, the number of master students was 1,625; the number of PhD students was 266, and the total number of graduate students was 1891. Since the survey of the entire statistical community was not possible due to its dispersion and scope, a sample of the community was chosen. Using a Morgan table, a sample of 350 students was selected, and a convenience sampling method was used. Finally, 323 questionnaires were completed and collected.

Given that in the present study, the researchers have tried to investigate the effect of independent variables on the dependent variable, and the method used for this study was casual. The collected data were analyzed using regression and variance analysis.

4. Findings and Discussions

According to the demographic analysis of the collected data, frequency distribution by gender, age, and educational level is shown in Table (1).

Table 1: Frequency Distribution by student's gender, age, and educational level

No	Gender	Frequency	Frequency percentage
1	Male	131	41
2	Female	192	59
Total		323	100
No	Age range	Frequency	Frequency%
1	22-30 Year	75	23
2	31-38 Year	126	39
3	39-46 Year	70	21
4	47-54 Year	41	13
5	55 Year And More	11	4
Total		323	100
No	Academic level	Frequency	Frequency%
1	Masters	300	92
2	Doctorate	23	8

To use the regression test, the possibility to use the regression model was first investigated statistically. The normality of collected data was tested using the Kolmogorov-Smirnov test (KS), and the results are presented in Table (2).

Table 2: Kolomogrov- - Smirnov test (KS)

Number	average	Standard deviation	Kolomogrove- - Smirnov	Sig
323	3.0717	0.790	1.340	0.055

According to Table 2, the significance level is greater than 0.05; therefore, the dependent variable's statistical assumption is normal.

One of the other assumptions considered in the regression is that the errors are independent of each other (the difference between the actual and predicted values by the regression equation). If the independence assumption is rejected and there is a correlation between errors, regression is not possible. To investigate the independence of the errors from each other, the Durbin -Watson test was used. The value of statistics in this test is in the range 0 and 4. The value of this test is 2.252 which is in the above range, and therefore, there is no correlation between the errors (Table 3).

Table 3: Independence test of errors using the Durbin - Watson test

Durbin - Watson	Standard error	Adjustment coefficient of determination	Coefficient of determination	Multiple correlation coefficient	Model
2.125	0.522	0.562	0.567	0.753	1

According to the analysis of the collected data, the role of six independent variables are explained in the form of regression of a variable and described in Table 4. These variables include higher education structuring policies, subsidy allocation to graduate policies, investment in graduate policies, innovation support policies, Applicable higher education policies, and the policies of culture-building higher education in the science production (dependent variable).

In Table 4, in column B, beta is presented by the constant value and independent variable coefficient, respectively. The Table of coefficients consists of two groups of standardized beta and not standardized beta coefficients. In not standardized beta coefficients, the scale of the variables are not the same if the standardized beta coefficients of the variables scale are identical, and it is possible to compare variables. Therefore, the standardized coefficients are used to compare the effect of the independent variable on the dependent variable.

Table 4: Test results of hypotheses 1 to 6 by independent variables

Hypothesis 1	Not standardized coefficients of determination		Standardized coefficients	Statistics (t)	The significance level
	B	Std.Error			
Constant value	1.727	0.170		10.182	0.000
Structuring higher Education	0.377	0.054	0.363	6.972	0.000
Hypothesis 2	Not standardized coefficients		Standardized coefficients	Statistics (t)	The significance level
	B	Std.Error			
Constant value	1.742	0.143		12.141	0.000
Allocation of Subsidy To Graduate	0.379	0.046	0.416	8.203	0.000
Hypothesis 3	Not standardized coefficients		Standardized coefficients	Statistics (t)	The significance level
	B	Std.Error			
Constant value	2.059	0.134		15.383	0.000
Investment in Graduate	0.308	0.048	0.336	6.395	0.000
Hypothesis 4	Not standardized coefficients		Standardized coefficients	Statistics (t)	The significance level
	B	Std.Error			
Constant value	2.304	0.117		19.696	0.000
Building Culture in higher education	0.222	0.043	0.279	5.208	0.000
Hypothesis 5	Not standardized coefficients		Standardized coefficients	Statistics (t)	The significance level
	B	Std.Error			
Constant value	1.265	0.108		11.657	0.000
Applied higher education	0.591	0.038	0.654	15.499	0.000
Model	Not standardized coefficients		Standardized coefficients	Statistics (t)	The significance level
	B	Std.Error			
Constant value	2.035	0.123		16.541	0.000
Innovation Support	0.2999	0.041	0.373	7.202	0.000

Now, suppose α and β are the constant and gradient of the regression line of community. In that case, the hypothesis test for these two can be written as follows:

$H_0: \beta = 0$

$H_1: \beta \neq 0$

According to the significant level for the coefficient of regression of the scientific production variable ($\text{sig} = 0.000 < 0.05$), H_0 , the value of this coefficient is zero, will be rejected. As a result, it can be concluded that for one increase in the independent variable, the science production increases as the coefficient obtained for that independent variable (due to the positive regression coefficient), and given that the regression coefficient will be significant, therefore, with a 95% confidence level, it

can be concluded that the hypothesis of the researcher on the role of each of the independent variables in the science production has been confirmed. Suppose all the variables are entered in the regimen model simultaneously. In that case, the coefficient of playing the role of independent variables in the science products will be described in Table (5).

Table 5: Regression coefficients of playing role-play of independent variables in science production simultaneously

Model	Not standardized coefficients		Standardized coefficients	Statistics (t)	The significance level
	B	Std. Error			
Constant value	1.013	0.163		6.230	0.000
Structuring	0.663	0.061	0.489	11.725	0.000
Subsidy Allocation To Graduate	0.625	0.067	0.418	3.205	0.000
Investment in Graduate	0.712	0.106	0.309	4.669	0.000
Building Culture	0.559	0.065	0.406	7.013	0.000
Applied Higher Education	0.567	0.098	0.602	5.067	0.000
Innovation Support	0.713	0.032	0.394	7.019	0.000

According to the regression model of table (5), this model will be described as follows:

Science production = 1.013 + 0.489 Structuring + 0.418 Subsidy allocation + 0.309 Investment + 0.406 Building Culture + 0.602 Applicability + 0.394 Innovation support

As shown, applied policies of graduates have played the most significant role in science production, and the least of these are policies related to investment in higher education.

The primary purpose of this study was to identify the role of higher education policies in the production of science through universities and to study and determine the dimensions of this role. In addition to validating the findings of previous research on the fundamental part of higher education policies in the production of science, this study found that the dimensions of this role are: structuring, subsidizing, investment guidance, culture building, application of education—excellent, and support for innovations. Therefore, the most important contribution of this research is to determine these six dimensions of the role of public higher education policies for the production of science.

One of the managerial implications that can be reminded to higher education policymakers is that based on the dimensions identified in the role of higher education policies, public policymakers in higher education should review policies that hinder the structural transformation of higher education. Develop new approaches that allow the structure of universities and research centres to adapt to new scientific and intellectual fields. Another managerial implication of this research is the formulation of policies focusing on strengthening investment in higher education, especially postgraduate education. Providing infrastructural incentives such as geographical location, introducing the titles of academic disciplines envisaged in the national land management and financial facilities, etc., can increase investment incentives. Another example of management that can be introduced is that policymakers

and the Ministry of Higher Education lead universities towards a central issue and a close link between industry and academia.

The limitation of this study is the use of a questionnaire. If other data collection tools were used, the results could probably be more profound. Also, the approach of this research has been quantitative, that if a mixed method is used, the findings could be more generalizable.

Among the paths that researchers can take in the future to complete this research are: Investigating the effects of higher education policies on the growth and intellectual development of graduates, examining the impact of higher education policies on increasing the quality of education in graduate school, examining the effects of higher education on the growth of universities' scientific works.

5. Conclusion

One of the factors affecting science production is structuring higher education. According to the results of comparative studies of higher education, universities are successful, which have a university life cycle system, the planning and development system, the maintenance and evaluation system, and the system of production and distribution. This system considers the role of assessment and validation as a critical factor and introduces it to reviving university life.

In 2014, Saa'd et al., in their study, emphasize the effect of structuring higher education on science production and believe that structuring higher education has a positive impact on science production; therefore, the result of this study is that the effects of this study are consistent with that research.

The subsidies allocation to graduate education has a positive and significant effect on science production. Targeting government education budgets in Iran requires an increase in the state budget in the field of quantitative and qualitative development of general education (elementary and secondary) and a gradual reduction of the state budget in higher education. When the subsidy is allocated to students who are science-seeker, it increases their motivation for studying. Another factor affecting science production is an investment in graduate education. Generally speaking, a community develops economically when it leads to significant changes in scientific, technical and skill knowledge. One of the most important factors affecting creating this development is governing the scientific spirit on society and the use of society's power to strengthen human capital, focus on the education system, and emphasize the quality and adaptability of the educational system to the needs of development.

Building the culture of higher education is another factor affecting science production. Higher education is the highest educational level in each country. Therefore, its building culture in higher education is necessary for science production. Education at high levels improves the social personality of the individuals and introduces them to a more affluent culture, human liberties and more educated, and creates a context for beneficial cultural and social changes at the community level. This culture and education are returned to schools through graduates. Building culture is necessary to ensure the quality of higher education, and it is needed to pay more attention to the monitoring and evaluation of research centres and science and technology parks.

One of the main concerns in all countries is to produce the applied sciences. Macro policies of science and technology communicated by the Supreme Leader and the country's comprehensive scientific map have also emphasized the transformation of science into wealth and power by

preserving Islamic values. Higher education plays a vital role in providing various economic, cultural and political needs of the community. One of its essential missions is to establish a relationship with society and meet its needs. Unfortunately, despite the importance of experience and the necessity of applied graduate education, the performance of functional units in the academic system is weak.

Many factors, such as the lack of qualifications in higher education outcomes to meet the needs of society and the inefficiency of universities, have led custodians of higher educators in many countries, such as Iran, to authorize the necessary authorities to modify the program to universities using decentralization policies. Individuals study in fields that do not have specific performance and are unemployed or enter unrelated careers after graduating. Therefore, another factor affecting science production is its applicability. Innovation often implies the creation of new ideas or products that need creative thinking. It is an aspect in which planning and direction of scientific policymakers in universities are necessary to strengthen it. In today's world, where the growth and spread of science and technology are considered critical elements of advancement and development in all cultural, scientific, economic and social aspects, educational and research institutions play an essential role. The role of universities and higher education centres has been confirmed in the 20-year perspective document of the country. Scientific development is the main task of the university. Sustainable and comprehensive development is realized in the responsive and efficient university and educational system. Thus, the main mission of higher education is to support innovation to be able effective in science production.

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