Iranian Journal of Educational Sociology

Iranian journal of educational Sociology

(Interdisciplinary Journal of Education)
Available online at: http://www.iase-idje.ir/
Volume 1, Number 5, August 2017

The Role of Higher Education Institutions in Education Development and Awareness of Electronic Services

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Article history:
Received date: 13 April, 2017
Review date: 15 may 2017
Accepted date:14 June 2017
Printed on line: 23 August 2017

Keywords:
Citizens' awareness and education, E-services, Higher education centers, VIKOR model, Gorgan

Abstract

Purpose: Citizenship education system in any country is influenced by a set of cultural, social, economic and infrastructural factors, each of which, in turn, plays a vital role in shaping and using electronic services. It is also one of the most comprehensive topics in e-government projects for educating the citizenry. The purpose of this study was to investigate the role of higher education institutions in education development and awareness of electronic services in citizens of Gorgan, Iran. **Materials and method:** For this purpose, the research method was descriptive-survey of the applied type. Questionnaires have been used to collect data. **Findings:** The results of this study indicated that the significance was reached to 99% among the factors influencing the increase of citizens' awareness and education in using electronic services among citizens of Gorgan, Iran in all indicators. **Discussion:** Also, using the VIKOR model, it was found that Golestan universities of agriculture and natural resources had the most impact among other higher education institutions to educate citizens about the use of electronic services. Finally, practical proposals have been made to increase the relationship between higher education institutions and citizens in the use of e-services.

Please cite this article as: Azma, F, Saeedi, M, Kouroshzadeh, N, (2017) The Role of Higher Education Institutions in Education Development and Awareness of Electronic Services **Iranian journal of educational Sociology,** 1(5), *127-137*

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[DOR: 20.1001.1.26453460.2017.1.5.8.2]

1. Introduction

City is considered as a source of development and the role of urban management in urban development and improvement of urban settlements has a very important role. Therefore, it seems necessary that, with the emphasis on traditional methods, it is no longer possible to pay special attention to cities in general and to macro-cities in particular, and that ICT should be used as a leverage of balance and a handful of managers and planners (Mohamadi et al., 2013). From the perspective of city managers, citizens' views about the city administration system and the level of awareness of citizens about their rights and responsibilities to the urban management system are very important. It is worth considering that social organizations are very complex phenomena that based on historical experiences and in the light of the theory of social fabrication and reality, can be said to be sensitive to ideas, plans and public opinion (Scott & Davis, 2007; Morgan, 2006). In today's world, teaching social life skills, familiarizing with rights and duties of citizenship, and educating citizens to live in the international community are the educational needs that require special attention. Such training, if it is desired, is useful and effective. They require a comprehensive plan, a professional and expert group, adequate and up-to-date training facilities and finally, a system of control and evaluation, as well as an efficient system of encouragement and punishment to define all these stages as a process of citizenship education (Shahtalebi et al., 2012). In this regard, education systems of different countries of the world have adopted different approaches for co-ordination with the international community in the field of citizenship education. Obviously, the effectiveness of these trainings among the groups that are on the verge of socialization and have a greater potential for admission and learning is of paramount importance. UNESCO has introduced the teaching of citizen culture, the education of children and adolescents from the very beginning of their childhood, with the aim of clarifying and familiarizing them to participate in community-based decisions, and saying that these trainings are not understandable without understanding the concept of culture. It refers to the necessity of considering the notion of cultural differences in education. Nevertheless, UNESCO, with the idea of democratic culture is trying to engage all people in the education of citizenship culture (Unesco, 2010). Also, the growing and increasing effects of technology on all aspects of life, including at the level of education have made it necessary for the development of countries to focus on advancement in higher education through the adoption of new educational systems and technologies (Miliszewska & Rhema, 2010) Hence, today, most universities are struggling to increase the effectiveness of emerging technologies in their educational activities (Andone & Sireteanu, 2009). Technology affects different aspects of life and there is an inevitable interaction between technology and learning (Jahanian & Etebar, 2012) which emphasize the need for the role of higher education institutions to increase citizens' awareness and education in using electronic services.

Good quality education should address the skills of problem-solving ability, effective communication, cardiology and critical thinking that require a large amount of information to be combined and interpreted (Rezaei & Shabiri, 2015). E-learning is based on computer-based education, intranet-based education, web-based learning, new paradigms and information technology products that push humanity to a major educational revolution. Moving from industrial society to information society is not necessarily an evolutionary movement, it is a structural mutation. Thus, for the first time, the possibility of a leap from the backwardness situation to advanced countries has been provided to the countries (International University of Iran, 2002). Meanwhile, the rate of development and application of information and communication technology in education is the most important indicator of progress, and virtual education or e-learning is the most important factor in scientific and cultural jumps. In other words, virtual education is the key to the transition of human resources to the information society. The transition to an information society with an e-literacy rate, the ability to read and write, the rate of productivity of information and communication systems has a direct relation. In most

[DOR: 20.1001.1.26453460.2017.1.5.8.2]

countries, policy related to the information and communication technology which considered as a computer literacy are at the center of reform efforts in educational systems (Safarian-hamadani et al., 2017). Also, in educational development programs in most developing countries, the issue of ICT development has been included. In our country, according to the fifth development plan, a timetable for the implementation of e-government, including in the educational system has been foreseen. On the other hand, we are moving from an industry-oriented society to an information-oriented society, or, in other words, passing through the physical world to the virtual world. Entering the age of information and life in an information-oriented society requires an understanding of its characteristics. One of the social institutions that is undergoing massive changes in this age is the institution of education and learning at the public and excellent levels. In the transition to society, information plays a major role on the part of the graduates of society, education and learning should be based on new approaches. The prerequisite for entering this area is the rapid and extensive expansion of e-learning from the lowest to the highest level of the educational system in the country (Farhadi, 2005). With the advent of new technologies, all individual and social spheres have been severely impacted, and higher education institutions have not escaped this phenomenon, and maybe a slow-moving revolution is emerging that marks the basis of traditional education. Taking into account the main components and its objectives, it brings new learning opportunities. Considering the advantages of using information and communication technology which is the awareness and training of citizens as the basis and the driver, and the necessity of participation citizens in urban management, especially the role of higher education in promoting it, the importance and necessity of research are clear.

Despite the efforts of all countries, especially developing countries, it still faces lack of infrastructure, awareness, ability, technical skills, cheap technology and inefficiency of state laws (Jalali, 2003). On the other hand, it is a controversial issue to consider citizens as the main stakeholders of e-government and to reduce the distance between people in accessing e-services and usability for all people (Rahnama et al., 2006). The citizenship education system in each country is influenced by a set of cultural, political, social, technical and economic factors, each of which in turn plays a crucial role in shaping citizenship education. As civil society has seen different meanings from ancient Greece to the present centuries, citizenship education also has different meanings with the evolution of the concept of civil society. In addition to access to information, citizens should also know how to use this information and have the skills to deal with their public issues (Rahnama et al., 2006)

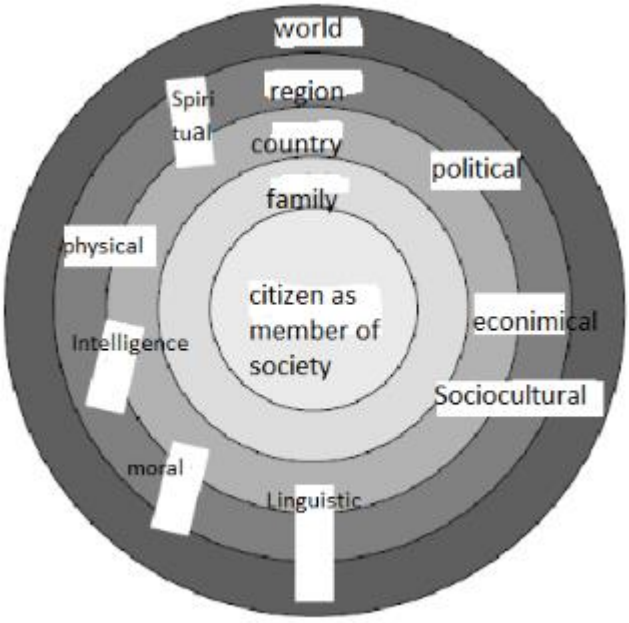

Figure 1- A holistic approach to citizenship education Quisumbing, (2002)

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Lack of adequate citizenship education is the beginning of a blur point in the social life of mankind. Therefore, one of the most comprehensive discussions in the e-government system is educating the citizen so they can easily live in e-government and not be afraid of technology. The smart citizen program is based on the design and development of a specific educational and practical program that reduces the use of online services by the general public through the mastery of computer skills, and empowers people in the community. All of them provide the opportunity to grow their abilities to use the Internet to interact in different areas. Therefore, they use bank, travel and leisure, treatment and all other things (Weerakkody, et al., 2012). One of the most important goals of the creation and expansion of e-government is the easy access to services, the reduction of the state, efficient management, the accuracy and comprehension of services to the people, the realization of social justice and the provision of services to citizens. In the meantime, the most important criterion for the knowledge of electronic government services is the familiarity of stakeholders, executives, organizations and citizens with the functions of e-government (Phippen, 2007). Citizens' awareness brings them to the truth that society considers for them. In addition to the inherent rights referred to in many researches (Pourezat, et al., 2010). Citizenship education will lead to the presence of smart citizens in e-government. Smart citizen has the ability to work with computers and the Internet to do business life, such as communicating with others, buying and selling, exchanging exchanges in line with the development of information, communication technologies and its influence on various aspects of life, in particular, at higher education levels, the knowledge literacy skills have become essential for survival in today's learned society (Hashemzadeh & Yari, 2010). On the other hand, the arrival of new information and communication technologies such as computers, Internet and Internet information networks in the field of higher education is a great opportunity to carry out some educational reforms and innovations that will increase the efficiency, effectiveness of the higher education system (Radomski, 2000) which creates the opportunity to educate citizens and citizens in the use of electronic services for college students and university administrators as citizens in the city.

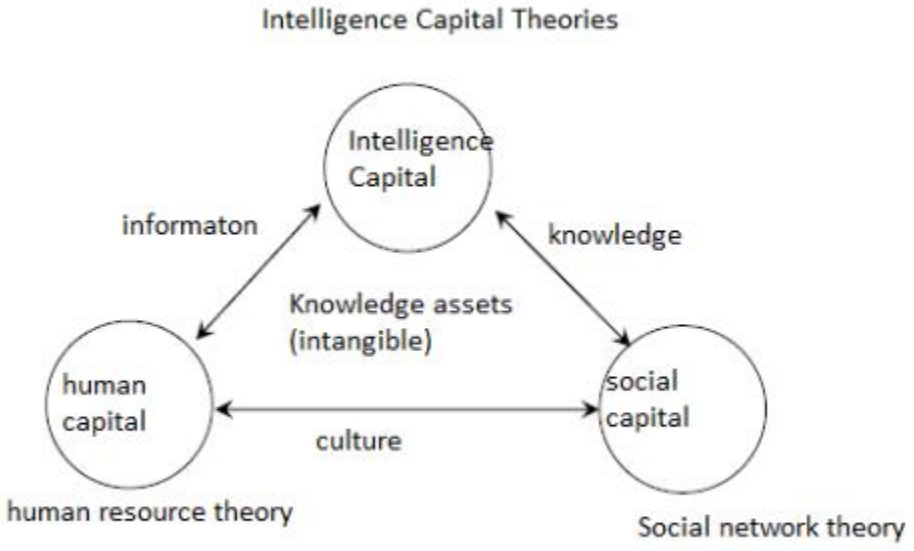

Figure 2- The cycle of learning and teaching levels in citizenship education (UNESCO- APNEVE, 2002)

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A glance at the history of the country's higher education system and attention to research done in this field reflects the fact that the theoretical and practical lessons learned from these trainings to educate a professional citizen with the facts about the professional citizenship of the countries the advanced world is different. Like many other countries, the Islamic Republic of Iran will sooner or later become a competitor in the international arena as one of the participants in the global economy and international market. Therefore, the creation of key competencies in university students as professional citizens can play an important role in comprehensive development, achievement of international standards and result in important economic, social, political, cultural and ultimately, improved quality of life. (Ghorchian & Eftekharzadeh, 2006). Gorgan 1404 Document is a strategic and operational program for the implementation of sustainable urban development in Gorgan, Iran which has various factors to achieve this goal. One of the most important factors affecting the establishment of an electronic city in Gorgan, Iran is the fact that this document in the perspective of Gorgan is also referred to as "smart Gorgan", which is one of the important issues that will certainly be taken by the achievement of sustainable development in Gorgan, Iran (Musazadeh, 1995). Gorgan, Iran is the third most populated city in the north of the country with many potentialities, including the availability of suitable economic and investment opportunities, the interest of the private sector, the establishment of the gates of Central Asia, the history of the various projects implemented in this area, and especially the existence of the authorities university have the potential to implement e-government projects and can engage in higher education programs by implementing programs. The city of Gorgan, Iran is an area of 3567 hectares of northern Iran and the center of Golestan province. According to the latest census of population and housing in the country in 2011, Gorgan, Iran has a population of 329536 people. The city of Gorgan, Iran has a population of 354,000 with three regions and eight district service areas, with a population of 115,000, a 124,000-urban two-state district and a population of about 114,000 inhabitants. In this regard, it should be noted that according to the instructions issued by the Ministry of the Interior regarding the zoning of cities over 100 thousand people and Article 54 of the Municipality Law in late 2014, the Ministry of the Interior agreed to the creation of the third district in the city of Gorgan (Public Relations of the Municipality of Gorgan, 2015). It should also be noted that according to the research topic, the total area of higher education spaces, which includes universities and higher education institutions, is in Gorgan, Iran is 583463, which per capita of urban residents is about 1.92 square meters, and covered 1.63% of the total area.

2. Methodology

The research method is descriptive-survey of the applied type. Theoretical foundations related to the research were studied through a library study. The data gathering tool was a researcher-made questionnaire, which has been extracted and categorized based on theoretical foundations and questionnaires related to citizen participation. The statistical population of the study was all citizens of Gorgan, Iran. Based on the Cochran formula, 383 individuals were selected as sample size. In the following, statistical tests were used to show the relationship between the components of the research. Finally, a ranking of higher education institutions in the city of Gorgan, Iran was obtained from the Vikor model.

3. Research findings

This part of the research was divided into two parts: descriptive and analytical findings. In the first section, we examined the socioeconomic status of the respondents, and the second part of the tests and models are used to achieve the research goal.

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Table 1- Socio-economic status (demographics) of respondents

Gender		Age		Marital status		Education level		Monthly income	
Male	61.7%	15-25 26-35 36-66	25.4% 60.6% 14.5%	Single	37%	M.A B.A Associate degree	15% 43% 12%	500 to 800 1 to 800 1 to 1.5	22% 24.8% 18.9%
Female	38.3%	56-70	9.5%	Married	63%	Diploma Under diploma	27% 3%	More	34.3%
Employment	Expert	Government's employee		Free job owner		illiterate		Others	
	7.3%	23.6%		14.1%		10%		45%	

The present study has been used to measure the participation of citizens from 6 items. Table 2 shows the indicators and indicators of citizen participation in this study.

Table 2- Indicators and items of Citizen Participation

Component	Indicators	Items
Citizen Partnership	Individual Dimensions	- Awareness -Education -Use of electronic services
	Cooperative dimensions	-Internet access - Citizenship Education Classes - Participation in electronic city development plans

Table 3- Assessing the impact of citizens' awareness and education on their use of electronic services

Dependent variable / Independent variable	Dependent variable	Kruskal-Wallis	Sig.
Awareness and education	Awareness	2.99	˙0.002
	Education	11.46	˙0.000
	Use of electronic services	4.11	˙0.000
	Internet access	1.98	˙0.001
	Citizenship Education classes	4.16	˙0.000
	The amount of participation in electronic city development programs	2.16	˙0.002

Source: Research findings, 2016; *: p≤0.01; **: p≤0.05; NS: non-significant

Table above, using the nonparametric Kruskal-Wallis test to examine the effect of citizens' knowledge and education on their use of electronic services, according to the outputs of this test, it can be concluded that in all Indicators up to 99% significance are influenced by the knowledge and education of citizens, the high impact of type of knowledge and education on these components is more affected by these factors that affect the literacy factor because in our statistical society, as shown in Table 1, most citizens with a relatively high level of literacy.

VIKOR model analysis

The VIKOR model in Excel is used to analyze the degree of availability. First, the data matrix was made up of 6 indicators for 7 universities (Table 1 shows data matrices). Then, using the entropy model, the weight was measured and the weight of each indicator was calculated.

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Table 4- Data matrix

Universities	Awareness	Education	Use of electronic services	Internet access	Citizenship Education classes	The amount of participation in electronic city development programs
Medical science	5	7	5	5	7	5
PNU	5	5	3	3	5	5
Agriculture	7	9	7	9	7	9
Golestan	5	9	7	7	7	9
Non-profit	3	3	1	5	3	5
Applied science	1	1	3	1	3	3
Azad	7	5	1	3	3	3

The second step is to normalize the decision matrix

At first, all matrix values reach 2 and the sum of each column is accumulated, then, the rotor sum of each column is taken and finally each of the values on the resulting rocks is divided.

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^{2}}}$$

Table 5- Exponent 2 of each column

Universities	Awareness	Education	use of electronic services	Internet access	Citizenship Education classes	The amount of participation in electronic city development programs
Medical science	25	49	25	25	49	25
PNU	25	25	9	9	25	25
Agriculture	49	81	49	81	49	81
Golestan	25	81	49	49	49	81
Non-profit	9	9	1	25	9	25
Applied science	1	1	9	1	9	9
Azad	49	25	1	9	9	9

Table 6- Total rotation of each column and the division of each of the values allowed on the rotation of the total

Universities	Awareness	Education	use of electronic services	Internet access	Citizenship Education classes	The amount of participation in electronic city development programs
Medical science	1.848053	2.976538	2.090605	1.772203	3.473518	1.565561
PNU	1.848053	1.518642	0.752618	0.637993	1.772203	1.565561
Agriculture	3.622184	4.9204	4.097586	5.741938	3.473518	5.072417
Golestan	1.848053	4.9204	4.097586	3.473518	3.473518	5.072417
Non-profit	0.665299	0.546711	0.083624	1.772203	0.637993	1.565561
Applied science	0.073922	0.060746	0.752618	0.070888	0.637993	0.563602
Azad	3.622184	1.518642	0.083624	0.637993	0.637993	0.563602

Stage 3: Weighing the normal matrix

For weighing, the normal matrix values of each of the options are multiplied by the weight of the criteria (obtained by the entropy method).

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Table 7- Weight Matrix

Universities	Awareness	Education	use of electronic services	Internet access	Citizenship Education classes	The amount of participation in electronic city development programs
Medical science	0.260589	0.563829	0.557685	0.349717	0.324733	0.175323
PNU	0.260589	0.287668	0.200767	0.125898	0.16568	0.175323
Agriculture	0.510754	0.932044	1.093063	1.133084	0.324733	0.568047
Golestan	0.260589	0.932044	1.093063	0.685446	0.324733	0.568047
Non-profit	0.093812	0.10356	0.022307	0.349717	0.059645	0.175323
Applied science	0.010424	0.011507	0.200767	0.013989	0.059645	0.063116
Azad	0.510754	0.287668	0.022307	0.125898	0.059645	0.063116

Step Four: Determining the values of the highest and lowest values of the normal weight matrix. The largest and smallest number of each column is determined.
Here the meaning of the largest number, the numeric value has the highest positive value and the smallest is the highest negative value. So, if our benchmark is negative, the largest number is the opposite that is it will be the smallest and the smallest will be the highest value and vice versa.

Table 8- The highest and lowest values of the matrix and its difference

f max	0.510754	0.932044	1.093063	1.133084	0.324733	0.568047
f min	0.010424	0.011507	0.022307	0.013989	0.059645	0.063116
fmax-fmin	0.500331	0.920538	1.070756	1.119095	0.265088	0.50493

Step Five: Determination of utility index (S) and dissatisfaction index (R)

$$S_j = \sum_{i=1}^{n} w_i \cdot \frac{f_i^* - f_{ij}}{f_i^* - f_i^-}; \qquad R_j = \max_i \left[w_i \cdot \frac{f_i^* - f_{ij}}{f_i^* - f_i^-} \right]$$

f* = The largest number of normal weight matrices for each column
Fij = The number of options for each criterion in the normal weighted matrix
F- = The smallest normal Zn matrix for each column
Naturally, for an option, for each criterion, a utility index is obtained that its sum is the final Sj parameter of the option.
The largest Sj of each option for each criterion, the dissatisfaction index (R) of that option.

Table 9- Utility and dissatisfaction index

Universities	Awareness	Education	use of electronic services	Internet access	Citizenship Education classes	The amount of participation in electronic city development programs	S	R
Medical science	0.924027	1.190615	1.045303	1.240542	0	1.217658	5.618145	1.240542
PNU	0.924027	2.083577	1.742171	1.594983	2.084111	1.217658	9.646526	2.084111
Agriculture	0	0	0	0	0	0	0	0
Golestan	0.924027	0	0	0.708881	0	0	1.632908	0.924027
Non-profit	1.540044	2.678884	2.090605	1.240542	3.473518	1.217658	12.24125	3.473518
Applied science	1.848053	2.976538	1.742171	1.772203	3.473518	1.565561	13.37804	3.473518
Azad	0	2.083577	2.090605	1.594983	3.473518	1.565561	10.80824	3.473518

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Step Six: Calculate Q value and final ranking of options
Through the following formula:

$$Q_j = v \cdot \frac{S_j - S^-}{S^* - S^-} + (1-v) \cdot \frac{R_j - R^-}{R^* - R^-}$$

V = Fixed number 0.5
Sj = Total sum of S for each option
S- = The largest index number S for each option
S * = The smallest index number S for each option
Rj = Total amount of R for each option
R- = the largest index of R for each option
R * = The smallest index of R for each option
Finally, the highest Q value is chosen as the best option.

Table 10- Final ranking based on the VIKOR model

Agriculture	1
Golestan	0.80596
Medical science	0.611452
PNU	0.339464
Azad	0.096045
Non-profit	0.042487
Applied science	0

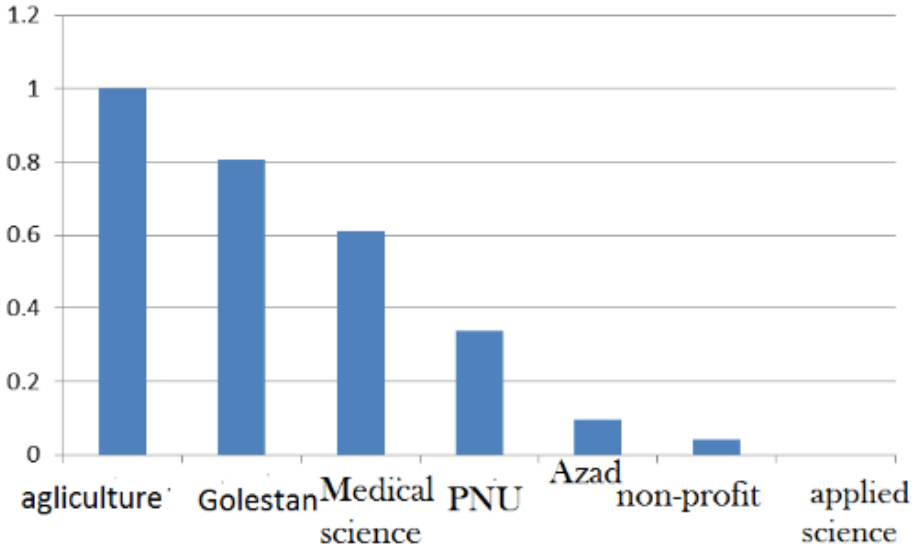

Figure 3- The final ranking of the Vikor model

4. Discussion

Nowadays, city managers and custodians have focused on determining the quantitative and qualitative aspects of electronic services, how citizens are co-operating in using these services to provide a framework for providing these services to citizens. Also, planning in the city administration and organizations involved in this should be such as to be able to inform citizens about the city's electronic services and increase the desire to use these services among them. In order to increase citizens' satisfaction and participation and the use of electronic services, government agencies and NGOs are required to improve and spread awareness and education

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of citizens in the use of electronic services. Higher education, as the highest educational system in the country, which is responsible for the training of professional citizens and community specialists, should focus more on its prospects and goals in this regard, and its efforts to educate active and informed citizens to participate in affairs. Cities adapt to the characteristics and problems of today's urban societies. Accordingly, due to the worthy position that exists in our value system for transcendental people, and due to the lack of research done in relation to research topic and theoretical framework, the present study aimed to examine the status of awareness and citizen's education in the use of electronic services and the role of higher education institutions in its expansion in Gorgan, Iran was carried out. To this end, library resources in the research-related theoretical bases and a researcher-made questionnaire in the information collecting section, the statistical tests and the VIKOR model was used to achieve the research goal. The results of this study showed that among the factors influencing the increase of citizens' awareness and education on the use of electronic services among citizens of Gorgan, Iran in all indicators, the significance was 99%. Also, using the VIKOR model, it was found that the universities of agriculture and natural resources and Golestan University had the most impact among other higher education institutions to educate citizens about the use of electronic services. Below are suggestions for increasing the relationship between higher education institutions and citizens in using electronic services:

- With respect to the positive and significant relationship between information literacy and skills with participation and use of e-services, it is suggested to top managers to conduct a course on citizenship and city management skills for students.
- Development of information and communication technology infrastructure in the city, in order to increase citizens' literacy and awareness.
- According to the future plan of the city of Gorgan (1404) which is mentioned as intelligent Gorgan, Iran planners and managers, with a special look at this issue are aware of the potential of citizens in increasing participation in decision-making using technology, information and communication.
- Further research by researchers on the role of excellent education centers in directing citizens to use electronic services at national level.

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[DOR: 20.1001.1.26453460.2017.1.5.8.2]