



Determining the Dimensions and Components of Elites Empowerment in Interaction with the Business Environment Based on Knowledge Economy and Technology

Mansour Bakhsh Amin¹, Farideh Reshadat Joo¹ and Akhtar Jamali^{2,*}

¹Department of Higher Education Management, Science and Research Branch, Islamic Azad University, Tehran, Iran

²Department of Social Medicine, Iran University of Medical Sciences and Health Services, Tehran, Iran

*Corresponding author: Department of Social Medicine, Iran University of Medical Sciences and Health Services, Tehran, Iran. Tel: +98-9123277953, Email: akhtar_jamali2000@yahoo.com

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Abstract

Background: The main objective of this paper was to determine the dimensions and components of elites empowerment in interaction with the business environment based on knowledge economy and technology.

Methods: This was an applied developmental study in view of objective and descriptive/observational and survey type with respect to the manner of sampling and data collection. Purposive sampling method was used to choose the participants. The statistical population of the study consisted of 3,000 managers of knowledge-based enterprises throughout Iran, 572 of whom were enrolled in the study. Overall, 362 of the participants responded to the self-made questionnaire, which included 80 items rated using a 5-point Likert scale, and 350 questionnaires were fully completed by the samples and were used for data analysis. The validity of the questionnaire was confirmed by 10 professors of Islamic Azad University. In order to determine its construct validity, the exploratory factor analysis was used, utilizing principal component analysis and varimax rotation. The reliability coefficient of the questionnaire was 0.87. For data analysis, exploratory factor analysis and analytical hierarch process were implemented using SPSS and LISREL tools.

Results: The results showed that the pattern of elites empowerment in interaction with the business environment based on knowledge economy and technology included the individual (0.260), intra-organizational (0.463), and extra-organizational (0.276) aspects.

Conclusions: Among these aspects, the intra-organizational factor had the greatest impact on the empowerment of elites. Therefore, for the empowerment of elites, executive mechanisms should be prepared in the frame of formulated components.

Keywords: Empowerment, Business Environment, Elites, Knowledge Economy, Technology

1. Background

Universities and institutes of higher education have gone through different stages since their inception, and their responsibilities have increased over time. At the beginning of their founding, universities often had educational responsibilities and, over time, research responsibilities were added to their duties. In the late nineteenth century, the role of universities in the production of science, research, and technology increased. A role that was effective in making science practical and expanded the social responsibility of universities towards the community. In the second half of the 20th century, after World War II, another development took place in the higher education systems of many developed countries; the main goal of the universities was to raise entrepreneurial human re-

sources for entrepreneurship through university-industry interaction, leading universities to have a more effective role in economic and social development of the community, wealth creation, entrepreneurship, and science application. In the new paradigm, acquiring and generating wealth from science is considered as a fundamental principle, and new concepts such as knowledge economy and knowledge-based development were developed (1).

The use of the term empowerment dates back to when industrial democracy and employee participation in organizational decision-making were developed under various topics such as teambuilding, active participation, and total quality management. In particular, the term was first introduced to the management literature in 1980, which can be considered as an answer to the promotion of Tay-

lorism approach to the work design, which recommended job simplification (2).

Blanchard believes empowerment is one of the most promising concepts in the business world, which has been underestimated. However, this concept has now become popular, and despite many discussions having been made, its exploitation has been limited (3).

In England, for interacting with the business environment, employers consider communication capabilities, learning ability, problem-solving capabilities, teamwork, and self-management capacity to be more important than technical capabilities, information and communication technology, and mathematical capabilities (4).

In the United States, Australia, and the United Kingdom, the salient point is that they differentiate job competence from basic capabilities. Therefore, it is necessary to distinguish between academic capabilities and cognitive abilities and job competencies. With this view, the first two types of capabilities (academic and cognitive) are the core or base of the required job capabilities, while job competencies are complementary to other competencies for participating in knowledge economy and new production processes (5).

Yang et al. have shown that, in Canada, knowledge workers make use of management, communication, and cognitive abilities more than others (6). It is believed that knowledge economy requires a set of new competencies; however, the basic capabilities are still essential in the 21st century. The ability to work and use information technology is a necessity of today's life. Nonetheless, this not only has not diminished the importance of the ability to read and write, but it is also impossible to control electronic devices without it. Therefore, new abilities do not replace traditional ones but complement or develop them.

Observations from the Organization for Economic Cooperation and Development (OECD) indicate that these economies have always acted on the basis of competencies (and not capabilities), and still formal knowledge and license-based competencies are the most important criteria for selecting a person for a position. However, the new competencies are another benchmark that form the basis for choosing a person for a job or position (7).

According to the member countries of the Organization for Economic Cooperation and Development, the Definition and Selection of Competencies (DeSeCo) project divides the characteristics of human capital within knowledge economies into three broad categories (8) that is, independent action, interactive application of instruments, and working in social homogeneous groups.

The Asian Development Bank, referring to the experience of the pioneering countries of Asia, described the capabilities needed to move towards a knowledge-based

economy as follows. In the knowledge age, changes are so rapid that workers must continuously develop their new abilities and competencies, and the foundation of this transformation is to move from routine to knowledge creation. Therefore, work environments should have features such as creativity, accountability, productivity, and adaptability to rapid changes, which will not be achievable for business environments unless the workforce is innovative and critical and capable of teamwork as well as problem solving. Furthermore, since the need for information technology capabilities is increasingly growing, the workforce must know how and where to search, process, and use the information and solve issues with minimal training and instruction. Moreover, they should constantly update their knowledge and communicate effectively (9). These features are consistent with the recommendations of the International Commission on Education for Twenty-First Century and the UNESCO Commission, which categorize vital capabilities in the 21st century as learning to act, learning to be, and learning to learn.

Supporting elites and creating opportunities for them to grow is one of the most important tasks of social institutions, especially higher education. This group of people is considered to be the largest and most valuable capital of each country and social life depends on their existence. Investing in these people can significantly develop the community in the intellectual, cultural, productive, and economic spheres. A society can reach the maturity and self-sufficiency that it always strives to achieve by providing the required conditions and facilitating the development and enhancement of exceptional abilities and talents. As stated in the Country's Strategy Document in Elites' Affairs, the emphasis is on planning to promote the quality of school education at all educational levels so as to enhance creativity, problem-solving, etiquette, and life skills.

In higher education, which includes the most effective educational courses for the empowerment of elites, it is beneficial to develop non-formal educational programs that are specialized for elites. At this educational level, elites must especially learn courses such as research methodology, entrepreneurship, and ways to communicate with business environments (Elite National Foundation). The practice of educating elites should take place in two stages. In the first phase, education should be such that the elite acquires general skills and becomes familiar with critical thinking. In the next step, the elite will be provided with the specialized education; and, in the end, a personal education program should be designed for each elite (10). In this regard, in recent years, some efforts have been made in Iran, including the establishment of the Young Researchers and Elite Club, affiliated to the Islamic Azad University, and the National Elite Foundation, which is un-

der the supervision of Presidential Deputy for Science and Technology. However, so far, elite empowerment strategies have not been scientifically developed. Given that no scientific research and conclusive results have been presented as to the subject domain of this study, the present study focused on the dimensions and components of elites empowerment in interaction with the business environment based on knowledge economy.

2. Methods

This was an applied developmental study in view of objective and descriptive/observational and survey type with respect to the manner of sampling and data collection. Purposive sampling method was used in this study. The statistical population of the study was managers of knowledge-based enterprises throughout Iran during 2015 - 2016. According to the Scientific and Technology Deputy of the President, there were 3,000 registered companies, and 572 companies, whose managers were members of the guild of knowledge-based companies, which were all selected as the study samples. While observing ethical considerations, including obtaining informed consent and ensuring the participants of the confidentiality of their specifications, a self-made questionnaire was emailed to all of them. Overall, 362 of the participants responded to the questionnaires and 350 questionnaires were fully completed and were used for analysis.

In the first step, according to the review of resources, studies, and related preceding tools, the initial tool was prepared. At the beginning, after an extensive library study and search of keywords of "elites", "empowerment", "business environment", and "knowledge-based economy" in Google Scholar, ISI, ISC, Scopus, and ERIC databases, the research background and theoretical fundamentals related to the subject of the study were recognized and formulated.

In the second step, according to the studies in the theoretical basics and semi-structured interviews with the youth and elite research clubs and the Elite National Foundation, individual (e.g., cognitive, communication, motivational, and performance components), intra-organizational (e.g., plans, executive, and assessment), and extra-organizational (e.g., economic, demographic, social, cultural, political, and international communication) aspects were identified, each of which has a different degree of credibility and importance.

In the third step, the self-made questionnaire comprising 80 items rated based on a 5-point Likert scale was prepared through consultation with the skilled experts and based on the priority of each of the obtained aspects and components. To establish face validity of the scale, we used

the opinions of 10 professors in the area of Higher Education Management about the form and general configuration of the items. For determination of the reliability of the questionnaire, the test-retest method was used. First, questionnaires were distributed among 30 members of the statistical population of the study, and after three weeks, the questionnaires were distributed again among the same group. Then, the data were imported into SPSS, version 21, and a reliability coefficient of 0.87 was obtained.

In the fourth step, this tool was distributed among managers of knowledge-based companies, and the obtained results were analyzed.

In the fifth step, to examine sampling adequacy, Kaiser-Meyer-Olkin (KMO) test was run, and for assurance that the correlation matrix used as the basis for factor analysis is not zero in the society, Bartlett's test of sphericity was used. According to the results, the samples were sufficient, and by using exploratory factor analysis method with the main components analysis methods and varimax rotation, the study components were reduced and grouped.

In the sixth step, using analytical hierarch process (AHP) method, the mentioned questionnaire was designed, which included 202 paired comparisons. The number of comparisons was determined based on the AHP solutions (This method is one of the most popular methods for ranking and determination of significance of the factors, which using the pair comparisons of the options, each of the criteria has been prioritized). In the AHP questionnaire, all model factors are taken into account and compared with each other. Thus, all related probabilities will be lost by ignoring one variable. Moreover, all criteria are compared and assessed in pairs. The maximum possible questions with suitable structure are asked from the addressee. Completion of the questionnaire by 20 of the experts (managers of the young and elite researchers club, national foundation of the elites, and research deputies of Islamic Azad University) was based on the determination of the degree of significance of each criterion compared with the other criteria. The selected significance included 1 time significance, 2 times significance, 3 times significance, 4 times significance, 5 times significance, 6 times significance, 7 times significance, 8 times significance and 9 times significance.

The results of AHP method in individual, intra-organizational, and extra-organizational aspects were defined, and using Pareto principle, 16 final components of the study were determined, which included the individual aspect (such as the components of having a strategic thinking, systematic thinking, capability of independent work, capability of planning and organizing activities, and capability of group leadership and guidance), intra-organizational aspect (such as interaction with policy

makers and planners, utilization of a feedback system and continuous improvement of programs and activities, supervision and monitoring of the programs, financial support of the elites and observance of the regulations by the managers, and accomplishment of the assigned affairs, intra-organizational circulars, and bylaws), and extra-organizational aspect (such as the components of development of entrepreneurship culture in the society, development of infrastructures and state of the art technologies, and improving capacity of local productions in the country, method and degree of utilization of communications technology, government performance in the field of communication with foreign countries).

Descriptive and inductive statistics were implemented using SPSS version 21 and LISREL tools.

3. Results

Of the 350 respondents, 79 (22.57%) were female. The results showed that 68 (19.43%) of the subjects had BA degree or less, 184 (52.57%) had a MSc degree, and 98 (28%) had a PhD degree. Moreover, 49 (14%) were 25 years old or less, 169 (48.29%) were between 25 and 35 years old, 110 (31.42%) between 35 and 45 years old, and 22 (6.28%) more than 45 years old. What is more, 138 (39.43%) participants were single and 121 (60.57%) were married.

In order to determine if our data were suited for factor analysis, KMO test was run. If the value of this measure is more than 0.6, implementation of factor analysis is permitted. In this study, the value of KMO for the study questionnaire was equal to 0.90, which permits factor analysis.

Bartlett's test: The results of this test indicate the appropriateness of the data for factor analysis. If the significance of this test is less than 0.05, the use of factor analysis for the identification of structure (factor analysis) is appropriate. Considering that in the present study, the value of (sig = 0.01) was obtained for the research questionnaire, factor analysis was acceptable.

After implementation of KMO and Bartlett's test, the table of common parts indicating the appropriateness of the variables for factor analysis was obtained. The table includes two columns of initial common parts and extraction, where all initial common parts are equal to one. The bigger the value of extraction common part, the clarification power of the question is more, and the questions whose extraction common part is less than 0.4 can be omitted. According to the values obtained from this test, from a total of 80 questions, 12 questions were omitted and 68 questions were retained.

The total value of defined variance: This test indicates the validity of questions, which includes three parts. The

first part (initial special values) defines the factors remaining in the analysis. The factors with a value less than one are excluded from the analysis. According to the results of this test, the three aspects were approved. The second part is related to the special values of extraction factors without rotation, and the third part indicates special values of the extraction factors with a rotation where the study factors have covered 63.96% of the total variance of the study. The results of this test are presented in [Table 1](#).

Rotation for obtaining a final answer and its commentary: This table displays the rotated matrix of the components, indicating each question measures which factor, and the question measuring more than one factor is not a suitable question. The results of this test in the present study showed that all the questions in the questionnaire were appropriate for measuring their related aspects. The results of this test are displayed in [Table 2](#) and the scratch graph in [Figure 1](#).

According to the data extractions from the rotation for obtaining the final answer related to the study aspects and components, the following deductions were made:

- The first factor is correlated with the questions labeled with "individual aspect".
- The second factor is correlated with the questions labeled with the "intra-organizational aspect".
- The third factor is correlated with the questions labeled with the "extra-organizational aspect".
- Therefore, the research indicators (n = 68) have three main aspects.

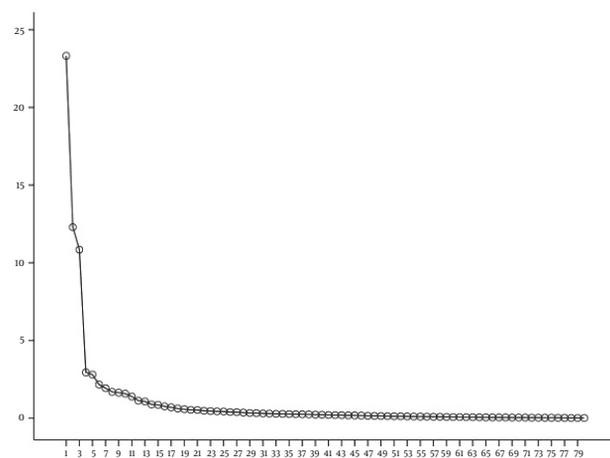


Figure 1. Scratch graph; charts of the elite empowerment components

Table 1. Total Value of Defined Variance Related to the Research

Dimensions	Initial Special Values			Special Values of Extraction Factors			Special Values of Extraction Factors with Rotation		
	Total	Variance Percentage	Aggregated Variance Percentage	Total	Variance Percentage		Total	Variance Percentage	Aggregated Variance Percentage
Individual	22.57	33.19	33.19	22.57	33.19	33.19	22.54	33.15	33.15
Internal	11.05	16.26	49.44	11.05	16.26	49.44	11.01	16.19	49.34
External	9.87	14.52	63.96	9.87	1.52	63.96	9.94	14.62	63.96

Table 2. Rotation for Obtaining Final Answer Related to the Conceptual Model of the Research

Component	Individual Intra-Organizational			Extra-Organizational			Component	Individual Intra-Organizational			Extra-Organizational				
	Individual	Intra-Organizational	Extra-Organizational	Individual	Intra-Organizational	Extra-Organizational		Individual	Intra-Organizational	Extra-Organizational	Individual	Intra-Organizational	Extra-Organizational		
Q.1	0.83	0.03	0.02	Q.18	0.76	-0.01	0.03	Q.35	0.68	0.02	0.01	Q.52	-0.02	0.8	0.19
Q.2	0.84	0.03	0.03	Q.19	0.76	0.01	0.04	Q.36	0.68	0.02	0.01	Q.53	-0.05	0.82	0.2
Q.3	0.82	0.03	0.01	Q.20	0.66	0.03	-0.01	Q.37	0.7	0.02	-0.05	Q.54	-0.06	0.83	0.21
Q.4	0.84	0.04	0.04	Q.21	0.77	0.01	0	Q.38	0.68	0	-0.03	Q.55	-0.06	0.83	0.22
Q.5	0.83	0.01	0.03	Q.22	0.78	0.03	0	Q.39	-0.01	-0.24	0.86	Q.56	-0.04	0.75	0.17
Q.6	0.81	0.01	0.02	Q.23	0.74	-0.01	0.04	Q.40	-0.01	-0.23	0.85	Q.57	-0.07	0.76	0.17
Q.7	0.8	0.03	0.03	Q.24	0.7	0.01	0.02	Q.41	-0.01	-0.23	0.82	Q.58	-0.02	0.76	0.13
Q.8	0.78	0.01	0.04	Q.25	0.73	0.04	-0.03	Q.42	-0.01	-0.23	0.83	Q.59	-0.06	0.84	0.17
Q.9	0.84	0.01	0.08	Q.26	0.78	0.03	-0.03	Q.43	-0.02	-0.24	0.84	Q.60	-0.07	0.83	0.17
Q.10	0.83	-0.02	0.04	Q.27	0.77	0.04	-0.03	Q.44	0	-0.24	0.86	Q.61	-0.03	0.84	0.18
Q.11	0.8	-0.02	0.11	Q.28	0.78	0.03	-0.01	Q.45	-0.02	-0.19	0.85	Q.62	-0.06	0.82	0.17
Q.12	0.84	0	0	Q.29	0.77	0.04	0.01	Q.46	-0.04	-0.19	0.86	Q.63	-0.05	0.85	0.21
Q.13	0.85	-0.01	0.04	Q.30	0.71	0.02	0.01	Q.47	-0.03	-0.22	0.85	Q.64	-0.02	0.75	0.21
Q.14	0.82	-0.01	0.04	Q.31	0.75	0.06	-0.05	Q.48	-0.05	-0.2	0.84	Q.65	-0.06	0.73	0.19
Q.15	0.84	0.01	0	Q.32	0.78	0.03	-0.02	Q.49	-0.04	-0.18	0.84	Q.66	0.01	0.76	0.17
Q.16	0.64	0.04	-0.01	Q.33	0.78	0.04	0	Q.50	-0.02	-0.19	0.83	Q.67	-0.06	0.64	0.1
Q.17	0.76	0.03	-0.01	Q.34	0.64	0.03	0.07	Q.51	-0.03	-0.2	0.85	Q.68	-0.04	0.66	0.15

3.1. Exploratory Factor Analysis for the Identification of an Individual Aspect

The results of KMO and Bartlett's test were as follows: Kaiser Mayer scale for sampling adequacy 0.95, Chi² estimate 18236.68, degree of freedom 703.00, and P-value 0.00. Therefore, factor analysis was suitable for the identification of the factor model in the individual aspect.

3.2. Exploratory Factor Analysis for the Identification of an Intra-Organizational Aspect

The results of KMO and Bartlett's test were as follows: Kaiser Mayer scale for sampling adequacy 0.95, Chi² estimate 7848.10, degree of freedom 78, and P-value 0.00.

Therefore, factor analysis was suitable for the identification of the factor model in the intra-organizational aspect.

3.3. Exploratory Factor Analysis for Identification of an Extra-Organizational Aspect

The results of KMO and Bartlett's test were as follows: Kaiser Mayer scale for sampling adequacy 0.94, Chi² estimate 6511.08, degree of freedom 136.00, and P-value 0.00. Therefore, factor analysis was suitable for the identification of the factor model in the extra-organizational aspect.

3.4. Results of Ranking of Components with AHP

Results of ranking of the main variables are presented in [Table 3](#).

Table 3. Results of Ranking of the Main Variables

Ranking of Main Variables	Weight	Rank
Individual	0.392	1
Intra-organizational	0.338	2
Extra-organizational	0.271	3

The results proved that "the individual aspect" with the significance of 0.392 is placed in the "first" rank, "intra-organizational aspect" with the significance of 0.338 in the "second" rank, and "extra-organizational aspect" with the significance of 0.271 in the "third" rank (Table 3).

3.5. Application of Pareto principle for Determination of Final Components

According to the Pareto principle, 80% of events always result from 20% of factors. Thus, 20% of the components with the most impact on the empowerment of elites were analyzed and used as the basis for planning. Table 4 shows the components that had the highest weight in Pareto principle.

The findings of the table above, which are the final results of this study, imply the impact of each of the components extracted in exploratory factor analysis. According to the exploratory factor analysis, empowerment entails individual, intra-organizational, and extra-organizational aspects. Since the number of components of empowerment of elites is extensive, with the application of the Pareto principle, the components with highest weights were selected using the AHP method. By weight, we mean the impact of each individual component on the empowerment of elites, and the total weight indicates the impact of each component compared with the other components in the empowerment of elites. The standard weight has been generated so that the total of all coefficients in the table makes the Figure 1. Moreover, the table above has the following implications.

- The intra-organizational aspect, with the weight of 0.463, has the most impact on the empowerment of elites. In other words, the performance of the Young Researchers and Elites Club as an organization could have the most impact on the empowerment of members of this club. In the intra-organizational aspect, the component of interaction with policy makers and decision makers, with the weight of 0.108, had the highest impact on the empowerment of elites confirming the systems theory.

-The individual aspect with the weight of 0.260 had the least impact on empowerment and it seems that the plans presented by organizations have more impact on the empowerment of elites. In the individual aspect, the component of strategic thinking with the weight of 0.83 had the

most impact and the component of the capability of working independently with the weight of 0.42 had the least impact.

- The extra-organizational aspect with the weight of 0.276 was in the second rank. In this aspect, promotion of the culture of entrepreneurship with 0.68 had the highest impact and government performance in the field of foreign policy with 0.44 had the lowest impact.

4. Discussion

In the current study, we strived to define the indexes for empowering elites in collaboration with the marketing demand based on the knowledge and technology-based economy. It is worth mentioning that the indexes were classified into individual, extra-organizational, and intra-organizational aspects. In this respect, after the final analysis, 16 exploratory indexes were accepted. According to the results, the strategic thinking, planning, and organization, independent working, systematic thinking, leadership, and team working abilities for the elites via participating in educational courses based on information technology and communication were considered as the most significant ones. On the other hand, further indexes such as infrastructures, updated technology development, and the extent of using information technology were also considered as the significant indexes. In conclusion, our findings were in line with the results of other studies including the study by Mayer (1992), entitled "the important qualifications for the elites' jobs according to the employers", the Philippines' education council study (1996), Hafman's study in England (2004), the study by Rich (1991), OECD studies in Canada (2001), International Bank study (2012), and the study of Armstrong (2003).

The notion discussed in the theories of organization and management that efficient organizations play a critical role in overall and balanced growth and development in the economic, social, and cultural sectors was approved in this study. In addition, the proposition by Alfred Marshall, an economic theoretician, "nothing results in an increase of national wealth as much as and as quick as improvement of training institutions" was corroborated in this study.

Table 4. Dimensions and Components of Empowerment of Elites

Dimensions	Weight	Standard Weight	Component	Weight	Total Weight	Standard Weight	Overall Rating
Individual	0.392	0.260	Having strategic thinking	0.371	0.044	0.083	3
			Having systemic thinking	0.427	0.022	0.044	12
			Ability to work independently	0.184	0.022	0.042	16
			Ability to plan and organize activities	0.37	0.044	0.042	15
			Leadership and group leadership	0.215	0.026	0.049	10
Extra-organizational	0.338	0.463	Interacting with policy makers and planners	0.285	0.057	0.108	1
			Using the feedback system and continuous improvement of programs and activities	0.276	0.055	0.104	2
			Supervising and monitoring the programs	0.218	0.043	0.082	4
			Financial support of elites	0.254	0.035	0.066	6
			The commitment of managers to regulations and related matters	0.228	0.032	0.061	8
			Institutional circulars and regulations	0.16	0.022	0.042	14
Intra-organizational	0.271	0.276	Developing the culture of entrepreneurship in society	0.590	0.036	0.068	5
			Development of modern infrastructure and technology	0.259	0.035	0.066	7
			High capacity of domestic production in the country	0.204	0.027	0.051	9
			The manner and rate of communication technology use	0.410	0.025	0.047	11
			Government's performance in the field of foreign policy and relations with foreign countries	0.303	0.23	0.044	13

However, our findings made it clear that the intra-organizational aspect contained six categories and the individual and extra-organizational aspects had five categories. It was concluded that modern educational methods must be designed; therefore, institutes must aim at illustrating the benefits of information technology in the context of education, which can result in crafting a plan to realize the mentioned concept. In this view, dealing with challenges and investigating research findings demonstrated the fact that the abilities like problem-solving, higher level of contemplating, and comprehension of data in addition to the skills like time-management and prioritizing the required techniques are the necessary factors in the ever increasing use of virtual space capacities and the global community in the framework of information due to their wide scope of application.

It seems that although we have witnessed a vast development of methods in the educational context of the country's elites, there still remains a considerable gap between our educational system and the optimal modern global education; consequently, it is necessary to rule out this gap in order to facilitate the settlement of a better communicative line and to improve the rates of knowledge exchange.

However, in the era of information explosion, it is not possible to compete with the global information market by sticking to the traditional and common methods of education. Thus, it is not possible to stay behind knowledge development since technology-based resources can cover the two main goals of education, that is, to synchronize individuals with the developing technology and to compete the economic society concerning the societal issues (11). Iran's population is now considered as one the largest educational communities in higher education domain. Accordingly, the quality of the country's educational structure should be improved to achieve all its potentials that are achievable via interaction with politicians and chief executive officers in industries.

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