

Evaluation Factors for Private Section Tendency Participation in Engineering Education in the Country

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ABSTRACT

Recognition factors and priority scheme in line with the participation of private sector engineering and technical needs and export of technical knowledge in science and economic development fundamental aim of this study was. Researcher intends to form a conceptual model to study the question which factors tend to increase private sector participation in engineering education programs and what factors influence priority scheme on its tendency to increase private sector participation will be how. Review field and interviews with semi-refined guidance comments using the Delphi technique can determine the tendency to increase private sector participation through factors such as: providing accurate list engineering jobs in the required development plan, tax breaks, eliminate administrative process added long-term loan transferred land and infrastructure services with a low rate, pay part of the educational per capita cost of engineering, entrepreneurship motivations is affected. Therefore, the main Topics article forms the assumption that increased private sector participation Engineering programs and export of technical knowledge through the application of the mentioned factors lead to the development of this type of activities will be. At the end of the tests conducted by the research hypothesis model in acceptable 95% confidence level and is significant.

Key words: Privatization, education, engineering, financial, administrative procedures.

1 – INTRODUCTION

One of the issues facing organizations today, beside investment in hardware and software issue of capacity building and empowerment of human resources. Capacity building is including human resource development, engineering education. It needs investment and physical capacity building in organization, long term planning and investment or in other words, continuous investment is needed. Development of human resources at the national level, often with engineering education titles is discussed, because it considers learning to prepare people.

Therefore, human resource development, associated education with useful employment thus, planning and human resources development is associated with the planning. At this level, human resource development encompasses issues such as workforce structure, labor ratios on the three sectors of agriculture, industry, services and regulation of educational and skill levels in terms of labor market demand and economic necessity, and like it. Obviously, first of all attention is focused on government. This means that the government only should invest in human resource development. Maybe can consider government responsible for investment and expansion of formal educational programs at different educational levels in the field of formal education means primary school level, junior and high schools and also at university level but human resource arguments and engineering education development notice to private sector more. It is important to note that in the present private sector participation has grown increasingly in various fields of economic and social and educational. As the private sector apart from complex bureaucracy that is governing in the public sector action has been more successful. This success through exporting technical and engineering service would be expandable. In the third millennium, the export of engineering services in global trade will be in charge of a large share. (Amsus,2007) Access to high rates of economic growth for a country that is located in the very early stages of development is of special importance and according to current volatility in world oil prices, Evanescent nature of the underground source and the nature of the national wealth raises this fundamental question to economic officials, our experts and committed entrepreneurs that which solution can change our country's economic structure that suffered from inefficiency and lack of wealth production and the makes the possibility of economic development of the country practical. (Chalabi, 1996, pp. 95-73)

In situations where the value of industrial production in different countries around the world is growing and a wide range of countries with effective policies put the development of non-oil exports at the head of his economic plans, serious attention and overall towards non-oil exports in general and considering export of

services as one of the most efficient of its kind specifically can be considered centrality of economic development policy . (December 2000, pp. 42-87)

In this respect due to the nature of the various species of export service regarding the export of engineering services in comparison with export of other services, has a special place .For this reason the development of private sector activity in this area can be very effective. It should be noted, conducted investigations also indicates this story that the volume of export of engineering services in recent years, due to the participation of the private sector in this area has been increased remarkably, with predictions made in the development programs in the country and this indicates the importance of exports in country's economic development. Today, sales and exports of goods and a country's products does not have the most important role of presence in international markets. But the supply of engineering power and implementation various projects in various industries is play notable role in world trade and strengthen their economic relations. (Tavassoli, 1996, pp. 110-135) Engineering Services as one of the main pillars of economic development among countries contains set of methods and tools that provides services to the community with the optimum use of resources and production factors including capital, raw materials and manpower, products ,offering engineering knowledge can only be done within the countries or swept across borders and spread to international markets. This development process can be increased with the participation of private sector in engineering education and export of engineering knowledge. In the third millennium, engineering services exports in global trade will have great portion of the responsibility this necessitates clearly shows the development of engineering education through private sector participation. Because in today's world, many services have the ability to export and science, knowledge, skills and experience become a valuable product tradable more than ever. Available, statistics give good news that country's export of engineering services has grown during the years 1990 to 1998 and continue such positive movement from companies that are exporter of engineering services in our country needs considering two main subjects including evaluation adequate amount of services in the region and even countries of Africa continent , considering the rapid advancement of technology in the world and other study activities of developed countries they are involved in export Engineering services for global markets. On the other hand regarding the recent developments in our country economy and limitations of foreign exchange resources can also create an opportunity for Iran engineering community and the private sector. In order to further develop their abilities and capabilities and play more worthy role in growth of engineering education of the country. With entry into third Millennium also in the years 2000 to 2010 AD some third world countries such as the Dominican Republic, Egypt and even a small country, Cyprus reduce their amount of dependency to outside and by increasing private sector participation in engineering education, and also the production of exporting technical knowledge of those countries and has been developed income due to that. Thus, a simple analysis of challenges facing engineering education in the country makes necessity of identify and analyzing risk factors essential for increasing private sector participation in this relationship

2 - Statement of Problem

The increasing development of technology and the creation of complex systems with responsive to the growing needs of society , puts producers and consumers in trouble, that a large part of these problems are solved with education and engineering skills . If only the public sector should take the above training due to budget constraints and possibilities effectiveness can't be required in the preparation of human resources. Therefore necessity requires that with help of facilities and capacities of private sector some of this important task be performed.

Fundamental question that in relation to engagement and participation of private sector in engineering education is introduced is that: How to motivate the private sector for increasing participation in engineering education?

According to research topic that is considered private sector participation in engineering education in line with the country's development prospects the following questions is investigated.

3 - The research questions

A: The main research question What are Effective factors of increasing tendency of private sector participation in engineering education programs?

(B) sub-questions

1 - Is providing an accurate list of needed jobs in National Development Plan is effective for private sector to strengthening their tendency to participate in the engineering education?

2 - Does putting tax exemption for private sector, who are interested to invest in engineering education is effect on the level of their willingness to participate in education engineering?

3 - Does elimination of unnecessary administrative procedures in the establishment of a private engineering education institutions, is effect on their willingness to participate in education engineering?

4 - Does the financial support of projects (long-term low-interest loans) affect on the willingness of private sector to participate in education engineering?

5 - Does the land transfer and infrastructure services with low prices affect on the willingness of private sector to participate in education engineering?

6 - Does payment of part of the per capita cost of engineering education affect on the willingness of private sector to participate in education engineering?

Does the entrepreneurial motivation affect on the willingness of private sector to participate in education engineering?

4- The importance and necessity of research

This study from the following aspects is important:

1 - The most important strategy in the country's 20-year perspective Is Outsourcing and delegating tasks to the private sector as a very effective proactive social and economic.

2 - Universities should discover appropriate policies to implement above strategy and increase willingness of private sector to invest in this and take informed actions.

3 - Discovering effective factors and transposition and impact of these factors can be helpful to universities in outsourcing programs and social and economic development activities

5 - Research objectives

1 - Understanding the current status of private sector participation in engineering education activities.

2 - Identifying factors that causing increase in private sector interest in engineering education.

3 - Presenting scientific framework in the field of degree of correlation between in private sector motivation for participation in affairs and use of research findings in promote the concept of engineering education in outsourcing.

4 - Discovering the relationship and its rate in each of the factors on willingness of private sector activities in engineering education.

5 - sort and prioritize important factors in increase willingness of private sector activities

According to the questions expressed conceptual model numbers (1) can be presented as an initial framework to review and express research hypotheses.

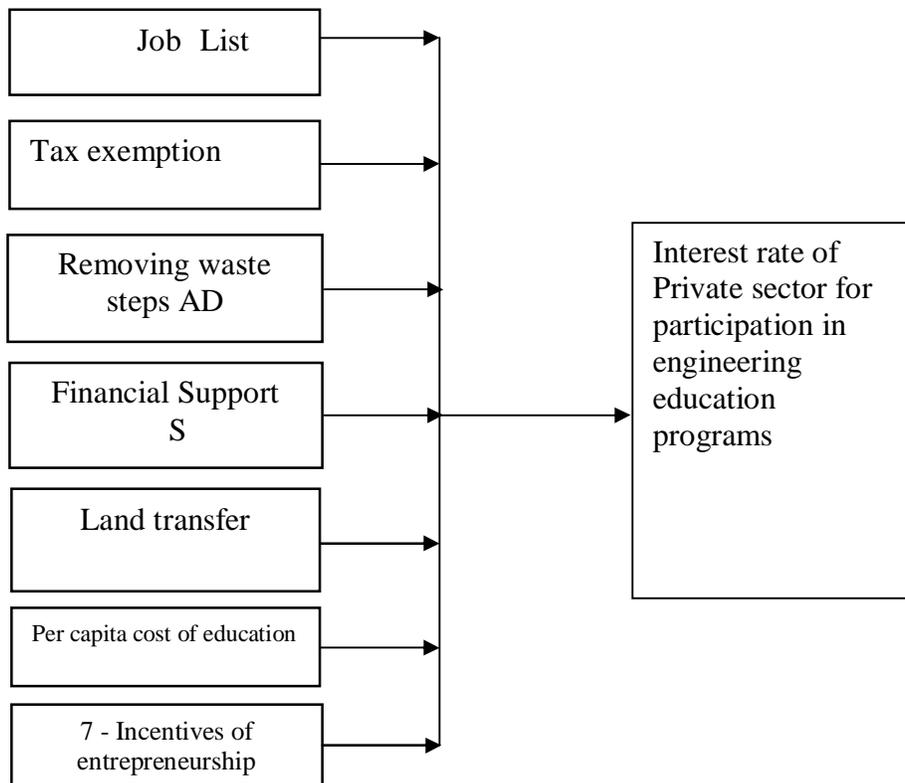


Figure (1): a Conceptual Model of Research

1 - Providing an accurate list of needed jobs in National Development Plan is effective for private sector to strengthening their tendency to participate in the engineering education.

2 - Putting tax exemption for private sector, who are interested to invest in engineering education is effect on the level of their willingness to participate in education engineering.

3 - Removing waste administrative procedures in the establishment of a private engineering education institutions, is effect on their willingness to participate in education engineering.

4 - The financial support of projects (long-term low-interest loans) affect on the willingness of private sector to participate in education engineering.

5 - The land transfer and infrastructure services with low prices affect on the willingness of private sector to participate in education engineering.

6 - Payment of part of the per capita cost of engineering education affect on the willingness of private sector to participate in education engineering.

7- Entrepreneurial motivation affect on the willingness of private sector to participate in education engineering.

6 - Research Background

Studies of the World Trade Organization Secretariat during the first year of the third millennium AD, has mentioned: according to statistics of this organization exports of engineering services during these years has increased about 70 percent. (Aghaie., 1989, pp. 121-110)

Recent changes in quality of market demand and consumer tastes and also globalization Of markets are features that has increased by increasing private sector participation in engineering education, and export of technical knowledge, (AdcockU2007)

Hawthorne studies caused attract attention of scientists and managers to the issue of Behavioral Sciences in supporting actions of human resources of private sector performance, as a Provocative agent stimulating satisfaction and enhancing efficiency. (Ackoff, 1980). Purpose of Hawthorne research is Studies that was conducted in the plan called Hawthorne the Western Electric company near the city of Chicago in United States. The purpose of these factory employers was raising the level of factory production and increasing efficiency of private sector workers. (Nosratiyeh, 1999,).

Thus, private sector participation in staff training and human resources community, to create positive action in the economy and society was raised as a serious idea in management and informal and unpredicted relationships in organization structure were of particular importance. (Baily, 2007) Quality cores that are called monitoring quality cores In Japan are the most recent models of employee participation and private sector in engineering education that serious attention of the Americans were attracted. (Nazari, 1980)

Herzberg and his colleagues at psychological services institute of Pittsburgh conducted a research about the relationship between communication needs, motivation and increasing employee participation, That largely confirmed effect of applying wisdom principles of communication in increasing participation of the respondents. (Ahituv, 2008) This study has shown that when individuals and groups are interested in their jobs show more efforts and they contribute more their job productivity will also be more.

7 - Variables and operational definitions of them

A: The dependent variable

Tendency to participate that is called to degree of willingness of private sector to participate in engineering education activities that is measured in a five distance scale of low interest rates to very high interest rate.

B: independent variables and the operational definition:

1 - Tax exemption: Is defined as the impact of tax exemption on willingness of private sector to participate in engineering education activities that is measured in a five-distance scale from very low to very high.

2 - Provide a detailed list of needed jobs in the development plan: Is defined as the impact of exact list of jobs on willingness of private sector to participate in engineering education activities that is measured in a five-distance scale from very low to very high.

3- Removing waste procedures: Is defined as the impact of removing waste procedures on willingness of private sector to participate in engineering education activities that is measured in a five-distance scale from very low to very high.

4- Paying long-term loans: Is defined as the impact of paying long-term loans on willingness of private sector to participate in engineering education activities that is measured in a five-distance scale from very low to very high

5- Land transfer and low cost infrastructure services: Is defined as the impact of land transfer and low cost infrastructure services on willingness of private sector to participate in engineering education activities that is measured in a five-distance scale from very low to very high

6 - Paying a part of per capita cost of engineering education: Is defined as the impact of paying a part of per capita cost of engineering education on willingness of private sector to participate in engineering education activities that is measured in a five-distance scale from very low to very high

7 - Incentives of entrepreneurship: Is defined Include as the impact of three motivations (the desire for success, achievement motivation and risk taking)on willingness of private sector to participate in engineering education activities that is measured in a five-distance scale from very low to very high

8 - The realm of research

Domain of The present study is considered in three topic domain perspective, the domain of spatial and temporal domains.

Topic: in terms of Topic the present study is placed in management, privatization and motivation theories.

Location: engineering education private systems in Iran.

Time: 24 months from 2007 until the first half of 2009

9 - MATERIALS AND METHODS

This study in terms of data collection is field research and seeks to describe and explain the relationship between various factors and the willingness of private sector participation in engineering education and is the type of applied research.

10 - Statistical population, sample and data collection

managers of private systems engineering education form the present study population. By using the relation:

$$n = \frac{z^2 \alpha \frac{1}{2} (p)(1-p)}{\epsilon^2}$$

n= Number of samples
 $z_{\frac{\alpha}{2}} = 1/96$

The significance level

$\alpha = 0 / 05$

P=q=0.05

$\epsilon = 0.05$ The estimated error rate

After placing the numbers of samples in this study is:

$$n = \frac{(1/96)^2 (0/5)(0/5)}{(0/05)^2} = 38416$$

384 samples were determined with 5% prediction error and 95% coefficient and validity of the questionnaire was confirmed by the Delphi technique and reliability and its reliability was confirmed by using Cronbach's alpha coefficient technique with 92% reliability ,statistical sample also distributed by using available sampling methods between managers in 30 provinces and of this number, 384 questionnaires were completed through phone calls by some managers of engineering education institutions that were present to answer to questions and in data analysis were used.

10-1 Data Analysis Description of Data

Table 1. Frequency distribution of age of respondents

Cumulative frequency	Percentage of valid	Frequency	Abundance	Age gap
38.3	38.3	38.3	147	Between 20-29 years
71.6	33.3	33.3	128	Between 30-39 years
92.7	21.1	21.1	81	Between 40-49 years
100	7.3	7.3	28	Over 50 years
	100	100	384	The total number of

Table 2. Frequency distribution of gender of respondents

Cumulative frequency	Percentage of valid	Frequency	Abundance	Sex
54.4	54.4	54.4	209	Man
100	45.6	45.6	175	Woman
	100	100	384	Total

Table .(3) the frequency distribution of married respondents

Cumulative frequency	Percentage of valid	Frequency	Abundance	Marriage
59.1	59.4	59.1	227	Single
100	40.9	40.9	157	Married
	100	100	384	Total

Table number (4) frequency response studies of respondents

Cumulative frequency	Percentage of valid	Frequency	Abundance	Education
31.8	31.8	31.8	122	Degree
86.8	55	55	211	BA
100	13.3	13.3	51	Master's degree or higher
	100	100	384	Total

Table 5 describes the dependent variable of interest in the private sector for investment managers In engineering education

SD	The average	Maximum	At least	The total number of	Parameters
0.1949	3.25	5	2	384	Tendency

10-2 Test research hypotheses

First hypothesis :Providing an accurate list of needed jobs in National Development Plan is effective for private sector to strengthening their tendency to participate in the engineering education .Linear regression was used to investigate this hypothesis. The output of SPSS value of correlation coefficient is equal to 91.6% since the value of this coefficient and P-value (sig) is significant ,it can be concluded assumption is rejected and the hypothesis is accepted. So providing an accurate list of needed jobs in National Development Plan is effective for private sector to strengthening their tendency to participate in the engineering education .Second hypothesis :Putting tax exemption for private sector, who are interested to invest in engineering education is effect on the level of their willingness to participate in education engineering.

Linear regression was used to investigate this hypothesis. The output of SPSS value of correlation coefficient is equal to 92.4% since the value of this coefficient and P-value (sig) is significant, it can be concluded assumption is rejected and the hypothesis is accepted. So putting tax exemption for private sector, who are interested to invest in engineering education is effect on the level of their willingness to participate in education engineering.

Third hypothesis: Removing waste administrative procedures in the establishment of private engineering education institutions, is effect on their willingness to participate in education engineering.

Linear regression was used to investigate this hypothesis. The output of SPSS value of correlation coefficient is equal to 24.6% since the value of this coefficient and P-value (sig) is significant, it can be concluded assumption is rejected and the hypothesis is accepted. So removing waste administrative procedures in the establishment of a private engineering education institutions, is effect on their willingness to participate in education engineering.

Forth hypothesis :The financial support of projects (long-term low-interest loans) affect on the willingness of private sector to participate in education engineering.

Linear regression was used to investigate this hypothesis. The output of SPSS value of correlation coefficient is equal to 27.6% since the value of this coefficient and P-value (sig) is significant,it can be concluded assumption is rejected and the hypothesis is accepted. So the financial support of projects (long-term low-interest loans) affect on the willingness of private sector to participate in education engineering.

Fifth hypothesis :The land transfer and infrastructure services with low prices affect on the willingness of private sector to participate in education engineering.

Linear regression was used to investigate this hypothesis. The output of SPSS value of correlation coefficient is equal to 74.2% since the value of this coefficient and P-value (sig) is significant, it can be concluded assumption is rejected and the hypothesis is accepted. So the land transfer and infrastructure services with low prices affect on the willingness of private sector to participate in education engineering.

Sixth hypothesis :Payment of part of the per capita cost of engineering education affect on the willingness of private sector to participate in education engineering.

Linear regression was used to investigate this hypothesis. The output of SPSS value of correlation coefficient is equal to 51.1% since the value of this coefficient and P-value (sig) is significant, it can be concluded assumption is rejected and the hypothesis is accepted. So payment of part of the per capita cost of engineering education affect on the willingness of private sector to participate in education engineering

Seventh hypothesis :Entrepreneurial motivation affect on the willingness of private sector to participate in education engineering.

Linear regression was used to investigate this hypothesis. The output of spss value of correlation coefficient is equal to 82.2% since the value of this coefficient and P-value (sig) is significant, it can be concluded assumption is rejected and the hypothesis is accepted. So entrepreneurial motivation affect on the willingness of private sector to participate in education engineering

10-3 Regression test

Multiple regression was used to measure the above subject. According to the output of spss value of correlation coefficient is equal to 98% since the value of this coefficient and the P-value (sig) is significant so it can be concluded that the overall effect of independent variables (Provide detailed list of job requirements, tax exemptions, removing waste administrative procedures, Long-term loans (financial support) , to private sector , land transfer and infrastructure services with low rates pay part of the per capita education cost, entrepreneurial motivations) on the dependent variable means participation of private sector as an act of social engineering in education will be accepted. The following model is presented.

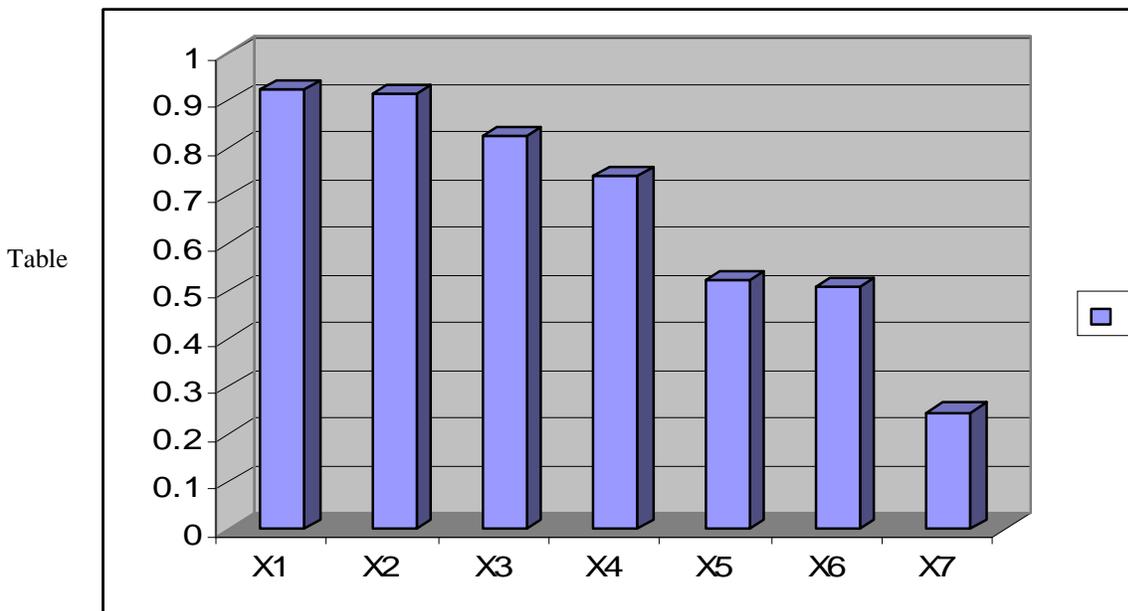
$$Y = 3.44 + .194X1 + .275X2 + .073X3 + .058X4 + .132X5 + .107X6 + .195X7$$

10-4 Assessing the priority level of each variable

Set priority levels for each variable use of rate of R so that whatever amount of R be greater represents a better and more relationship between independent and dependent variables and puts It in a higher position of ranking. (See Figur 2 and Table 6).

Table 6: The priority ranking of independent variables

Priority	Code	Variable name	R
1	X1	Provide an accurate list of needed jobs	0.924
2	X2	Tax exemption	0.916
3	X3	Entrepreneurial incentives	0.827
4	X4	Land transfer and infrastructure services with low prices	0.742
5	X5	Long-term loans (financial support)	0.525
6	X6	Payment of the per capita cost of technical and engineering education	0.511
7	X7	Removing waste administrative procedures	0.246



(3):Prioritization effective factors in the increase willingness of private sector for participation in engineering education

11 – Conclusion and Suggestions

According to conducted tests and significance of coefficient B in regression models can be deduced that providing accurate lists of needed jobs in National Development Plan for the private sector and the transparency of this listing affecting on willingness of private sector managers for participation in engineering education activities and according to the positive correlation between the exact list of jobs needed and interest rate on private sector participation, it can be used as a fundamental factor also considering tax exemptions for participants of investment in engineering education and the tendency moderators of this forum a relationship is existed and this relationship is positive. Means by increasing amount and scope of tax exemptions for participants, their interest rates will increase. While by removing the administrative waste that in process of engineering education institutions should be established and it can be expected the private sector's willingness to participate in the establishment and implementation of these centers is effective and with considering that the correlation coefficient is positive. It can be concluded that with increasing optimization process through removing waste administrative procedures participation of private sector will be increased but this increase is not widespread. There is a relationship between long-term loans with transparent and easy process to the private sector and its tendency to participate in activities engineering education but this relationship is not strong therefore, more attention should be devoted to the subject to determine the cause. According to the fifth hypothesis test result it could be inferred that there is a relationship between the land transfer and infrastructure services with low rates and willingness of the private sector to invest in engineering education, and by the relationship is positive and direct and by increasing this variable tendency of private sector for participation will also increase. With increasing the amount paid a part of cost of per capita of engineering education to private sector and expand the scope of this payment we can expect increases in tendency of mentioned managers for participation in this field. There is a positive relationship between entrepreneurial motivation and the willingness of private sector to participate in education engineering and by increasing this variable tendency of private sector for participation will also increase. **Suggestions are:**

According to the tests results obtained from the first hypothesis is proposed to document a comprehensive study to prepare clear and transparent list of needed jobs in preparing national development plan and separate in various fields and provide for applicants of investment in engineering education.

1. According to the tests results obtained from the second hypothesis is proposed that different types of tax exemptions with the ability of adapting with views of risk aversion and risk taking of investors be compilation in form of regulated be provided for private sector.
2. According to the tests results obtained from the third hypothesis is proposed that a cycle management productivity system should be implemented for recognition and documentation of administrative processes participation of private sector in establishment of engineering training institutions and new work flow diagrams with minimum waste of time and cost should be designed.
3. According to the tests results obtained from the fourth hypothesis is proposed that various plans to transfer long-term loans that have adaptability with different preferences of participants should be provide for private sector.
4. According to the tests results obtained from the fifth hypothesis is proposed land transfer and related infrastructure services with systematic form and with high speed be transferred to private sector until they participate in engineering education and production technology with more interest
5. According to the tests results obtained from the sixth hypothesis is proposed with a detailed field study the amount of per capita cost of engineering education with scientific form was explained and with transfer of such facilities willingness of private sector managers for their participation in engineering education and production technology was increased.
6. According to the tests results obtained from the seventh hypothesis is proposed that for increasing private sector participation should provide a communication plan to identify entrepreneur individual and the amount of their interest in the field of the establishment of engineering educational institutions until encourage them to participate in these processes.

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