Science and Technology 2013, 3(5): 141-146
DOI: 10.5923/j.scit.20130305.01

Identifying and Prioritizing Effective Factors on Developing Intelligent Universities

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Abstract Present study was done to identify and prioritize effective factors on developing intelligent Universities by means of descriptive and sectional survey method in 2013. Statistics population were consist of 900 Professors and principals of Mazandaran province in Iran country University in which from this population 270 persons were selected according to stratified random sampling method. To collect data, researcher made questionnaire considering world experiences was used. In order to define validity, Professors judgment in this field was considered and the reliability amount was calculated 0.80 according to cronbach alpha. Data analysis was done by means of descriptive and inferential (one sample T test, means classification test) statistics. The results show that technological factors, cultural factor, strategic factor, economic factor, legal factor, social factor are effective on developing intelligent schools, respectively.

Keywords Intelligent Universities, Information And Communication Technology, Technological Factor, Educational Factor, Cultural Factor, Strategic Factor, Economic Factor, Legal Factor, Social Factor

1. Introduction

Today world is developing and need skills and sciences. Educational processes if integrate with technology, can be helpful (Zofan,2004). Information technology refer to a branch of science which is based on development and using computer, software and other technological devices which used in the fields such as evaluation, consideration of educational, training – learning data, information systems and educational information exchange(Lorkian, 2005). One of rational ways of facing with information and communication revolution is make effort on education and training, which at first human acceptance power should be reinforced and they should be educated in such a way that adopt their speed with continues changes and prepared them to be active and effective in facing with changes and developments by making development in human insight, knowledge and attitude and increase individual and social skills (Ebadi,2004). In quickly changing today world, human must be equipped with the capacity of accompanying with every day changes. they must be able to acquire necessary informational knowledge and skills for successful life by means of informational and communicative resources and have an active participation as a responsible and committed member for themselves, family and society in all positive aspects of life and should participate in problem solving by using easiest communicative devices to create local, national and international communications. The integration of electronic technologies in training – learning process is important and inevitable issue because learners should learn how live and work in society in which electronic media faced them continually with cultures and values various from their native culture and values (Khosravi,2007). One of these stages is developing intelligent Universities which performed in some cities of country, experimentally. Intelligent Universities refer to those educational units which presenting educational training services for students by means of e. learning in forms of face to face and by preparing physical situation, teacher and student can act by enjoying intelligent educational system and integrative and comprehensive approach. intelligent Universities consist of intertwined components which designed in order to motivate students curiosity sense and their active participation so that by coordinating students, teachers and principals efforts, could meet all persons educational needs in comprehensive and integrated environment (Ebadi,2004). These Universities use electronic devices such as computer, internet… for training in University to provide ground for economic, cultural, educational growth and fulfillment by providing proper situations. The approach of intelligent Universities is comprehensive and integrative approach. It is

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Published online at http://journal.sapub.org/scit
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"comprehensive" because it tries to prepare comprehensive ground for students talents growth by meeting students needs according to various methods of learning and using multimedia devices (visual, verbal, audio and practical) and it is "integrative" because instead of instrumental using of information technology, become effective and efficient educational system by integrating course mid- programs and learning methods and processes. In addition, an educational model of intelligent Universities requires student's active participation. Therefore, final goal of activating intelligent Universities is training work force equipped with computer skills and information literacy in order to meet life requirements in modern informational world (Rezaei Rad, 2012).

According to mentioned issues, in order to develop and realize this goal, identifying effective factors considers as basic stage. The factors which this study emphasized on it and prepare questionnaire according it,include educational factors such as : educating and training professional experts in the field of information and communication technology in teacher training centers and universities, increasing understanding about new educational needs, training students to use computer in educational activities, training teachers to provide and produce proper educational software, cultural factor: changing culture of using internet, cultural officials controlling on the process of e. learning, the amount of acculturation related to information and communication technology, social factor: acquaintance of public with e. learning, create positive attitude in society about using information technology, provide suitable background about learning technology in society, economic factor: decreasing primary costs of developing e. learning in schools, make access to information and communication technology with low costs (access to internet and computer technology), participation and investment of private sectors in e. Learning, technological factors: reinforcement of information technology infrastructures (computer, telecommunication infrastructure, providing educational software in Persian language, preparing professional work force in using information and communication technology), legal factors: compiling legal framework to support creative plans in e. learning, reinforcing electronic security, reinforce policies, guidelines, and practical laws, strategic factors: prepare clear strategies for educational organizations in country, create total strategy and perspective in the field of information technology, precise planning to allocate priorities and …

In this way, several studies and surveys are:

Sadri Arhami, (2004), M.A thesis (virtual education in Iran and strategies by emphasizing on higher education):

In this thesis, cultural issues addressed as main factor in using e. learning in higher education level. Issues such as people contrast and resistance about using traditional education methods and existence of special problems about e. learning such as telecommunication base in Iran, lack of proper facilities for software and proper hardware costs can lead to unsuccessful application of e. learning in higher education. Salehi and Kashani (2006) in their survey about "effective factors on applying intelligent schools plans" identified existence of educational planning proper with information and communication technology in schools, training and educating skilled human resources to use information and communication technology and existence of facilities and financial resources as main components of this planning.

Moayyadnia (2005) in article titled" intelligent schools, new approach in country education and training "mentioned following barriers as serious barriers of distribution and development of intelligent school: insufficiency of expert and educated human resources and lack of financial and physical resources to equip intelligent schools with computer systems and equipments and requirements, structure, culture and capability of using current tools and facilities, environment and more important is public thinking and perception about this issue and the lack of culture of using information and communication technology among people and officials and especially teachers and founders of education and training in country.

Also, Mahmoodi et.al (2008) in the study about "considering the challenges of developing intelligent schools" reviewed some challenges of developing schools due to polling from experts and those who involved in education and training and the results showed that the following factors are most important factors of developing intelligent schools, respectively: the lack of required laws and regulations in ministry, unavailability of required infrastructure such as local network and connection to internet, lack of conformal structures and organizations of schools in country, readiness and maturity about using information technology in schools managing system, perceive required necessities of using information and communication technology by school principal, existence of physical environment required for employing intelligent schools plan, high costs of changing education system, lack of teachers preparation about using ICDL skills, lack of common using of internet among teachers, lack of desires in society about new technology.

Easy (2007) in study mentioned the barriers of e. learning development and presented suitable model for using it in secondary school level (from principals and teachers point of view). The study results showed that 56% of teachers and 78% of principals, according to the rank of high and very high, mentioned technical and technological factors as barriers of e. learning development. Also, 50.4% of teachers and 61.1% of principals mentioned legal and administrative factors according to high and very high level and 68.8% of teachers mentioned economic factors as barriers of developing e. learning in secondary school level.

Also, Le Blanc and Wands (2001) categorized the factors for successful e. learning into 3 groups: Organizational, general, and cognitive.

Organizational factors are: 1-Technical infrastructure 2-clear definition of change in management strategy 3-

management support of education

Genera factors are: learning principles for adults 2-clear definition of learning results 3-pretest item 4- clear definition of learning evaluation paths.

Cognitive factors are: 1-access to suitable facilities of supplementary educational materials 2-controling information page by user 3-user simple interface 4-access to complex information 5- prepares use of media 6- avoid additional information.

Also, Howard(2008) in the survey about "studying information and communication technology infrastructure and human resource capacity in Liberia" resulted that reinforcing telecommunication infrastructure, human, economic, social resources curriculum plan based on information and communication is necessary in order to develop information and communication technology.

Also Koponon (2008)in the study about e. learning development, establishment and usage mentioned that in preparing human resource with e. learning, factors such as physical, cognitive, emotional, social and cultural factors are important and effective. By considering recent changes in educational system path it can be resulted that most of these changes in the stage of using educational technology are related to questioning and answering and accessing to technology initial skills .

This issue defines the field of using technology for basic and important skills.

Study goal: identifying and prioritizing effective factors on intelligent Universities from Professors and principals' point of view in Mazandaran province in Iran country.

Study hypothesis:

1- Educational factor is one of effective factor on developing intelligent Universities.

2- Cultural factor is one of effective factor on developing intelligent Universities.

3- Social factor is one of effective factor on developing intelligent Universities.

4- Economic factor is one of effective factor on developing intelligent Universities.

5- Technological factor is one of effective factor on developing intelligent Universities.

6- Legal and administrative factor is one of effective factor on developing intelligent Universities.

7- Strategic factor is one of effective factor on developing intelligent Universities.

8- There is significant difference between effective criteria of developing intelligent Universities.

2. Material and Methods

Since present study identifies and prioritizes effective factors on developing intelligent Universities, in order to present model for country and trying to investigate Professors and principal's point of view, descriptive survey (field study) and sectional study method were used. Statistical populations are consisting of 900 Professors and principals of in Mazandaran province in Iran country I which from these populations, 270 persons were selected according to stratified random sampling method. In order to collect data researcher made questionnaire consist of 44 items regarding global experiences was used. Items scaled in terms of 10 choices from very high to very low. To define validity, professor judgment of this field was considered and the amount of questionnaire reliability calculated 0.80 by means of cronbach alpha.

In this study, after collecting questionnaire, data were coded and entered in computer and analyzed by means of descriptive and inferential statistical methods, one sample T test and Friedman test (mean scoring).

3. Results

An Descriptive study of factors

Based on observed results which collected descriptively in table 1, each of effective factors on developing intelligent Universities. estimated from some of questionnaire item, (educational (11 items), cultural (4 items), social (4 items), economic (7 items), technological (7 items), legal (5 items) and strategic (6 items))in which each item was scored from 1-10, so, min and max scores which achieved by means of each factor are: educational (11-110), cultural (4-40), social (4-40), economic (7-70), technological (7-70), legal (5-50), strategic (6-60), respectively. Mean and standard deviation for each factor are: educational (28.01, 15.91), cultural (9.73, 8.42), social (11.80, 6.78), economic (18.84, 12.24), technological (15.63, 10.07), legal (14.09, 8.31) and strategic (19.09, 8.13), respectively.

Table 1. Descriptive study of effective factors on developing intelligent Universities

Coefficient of changes	Standard deviation	mean	Maximum data	Minimum data	factors	raw
56.80	15.91	28.01	110	11	educational	1
86.53	8.42	9.73	40	4	cultural	2
57.46	6.78	11.80	40	4	social	3
64.97	12.24	18.84	70	7	economic	4
64.43	10.07	15.63	70	7	technological	5
58.98	8.31	14.09	50	5	legal	6
42.59	8.13	19.09	60	6	strategic	7

Table 2. One sample T- test to evaluate effective factors on developing intelligent Universities

Result Of test	sig	tβ	Degree of freedom	T μ	Difference of mean	Mean of population (cut point)	Mean of sample	factors	raw
H0 reject	0	1.96	269	29.95	28.99	55	28.01	educational	1
H0 reject	0	1.96	269	20.04	10.27	20	9.73	cultural	2
H0 reject	0	1.96	269	19.88	8.20	20	11.80	social	3
H0 reject	0	1.96	269	21.69	16.16	35	18.84	economic	4
H0 reject	0	1.96	269	31.61	19.37	35	15.63	technologica l	5
H0 reject	0	1.96	269	21.57	10.91	25	14.09	legal	6
H0 reject	0	1.96	269	22.05	10.91	30	19.09	strategic	7

Table 3. Mean of scores

Strategic	Legal	Technological	Economic	Social	Cultural	Educational	Effective factors on developing intelligent Universities.
16.4	3.61	4.74	3.76	3.20	4.22	4.31	Mean of scores

Table 4. Friedman Test

Result	Possibility (sig)	Degree of freedom(df)	X2 Squar (X^2)	Number (N)	Statistical criteria
H0 reject	0	6	29.96	270	Friedman Test value

According to data results of table 2, since calculated t for each effective factor on developing intelligent Universities are:

Educational (T μ=29.95), cultural (T μ=20.04), social (T μ=19.88), economic (T μ=21.69), technological (T μ=31.61), legal (T μ=21.57) and strategic (T μ=22.05) at the confidence level of 95% (α=0.05) and the degree of freedom n=fd -1 =269 is higher than t critical table (tβ=1.96), therefore null hypothesis (H0) is strongly rejected by data and study hypothesis is approved. So by confidence level of 95% or even 99% we can claim that these factors affect on developing intelligent schools, absolutely.

Next stage answer to this question: can 7 factors affect o developing intelligent Universities equally? For this purpose, since the scores of factors were not equal, we confirm them based on score 100 and evaluate their equal effectiveness in terms of following hypothesis by means of Friedman rank test.

Hypothesis 8: There is significant difference between effective factors on developing intelligent Universities.

Based on observed results collected from Friedman Test table, the P-value in confidence level of 95% with degree of freedom (dg=6) is lower than significant level (α=0.05), (sig=0) and null hypothesis (H0) rejected strongly by data and study hypothesis approved, i.e, by confidence level of 95% and even 99% we can present following descriptive ranking for effective factors on developing intelligent schools:

1- technological factor with mean score of 4.47
2- educational factor with mean score of 4.31
3- cultural factor with mean score of 4.22
4- strategic factor with mean score of 4.16
5- economic factor with mean score of 3.76
6- legal factor with mean score of 3.61
7- social factor with mean score of 3.20

4. Conclusions

In this study 7 components were considered as effective factors on developing intelligent Universities. That each factor consists of related subsets. The priority of effective factors on developing intelligent Universities.

Is mentioned below, respectively:

According to hypothesis 1, study results show that something which makes educational factor become effective on developing intelligent Universities are features of educational factors, so, as this study defined, human resource training in the fields of information technology in scientific centers considers as very important criteria in these Universities. Training efficient human resource although require a lot of costs but, can act as pioneer of ideas and opinions of information technology. Scientific and practical experiences showed that something that lead countries successfulness is efficient human resources in required fields.

Parts of these human resources are Professors. Developing knowledge level besides skills in the fields of information technology can prepare required human resources for intelligent Universities and in one hand, this group can double effectiveness on its main audience which are students. Also, study results showed that in order to develop intelligent Universities, new educational needs should be identified and content and e. learning programs should be prepared based on them. The results showed that although the factor of controlling process, education in country (from high to low), dividing works in education system, training parents to use computer and students desire to change their role are important, but they are lower than above mentioned factors.

Present study results are in line with results of Salehi and Kashani (2006), MoayadNia (2007), Mahmoodi et al (2008). Easy (2007), Le Blanc and Wands (2001), Howard (2008) and Kaponon (2008).

According to hypothesis 2, it is apparent that from principals and teachers point of view, cultural factor is one of effective factors on developing intelligent Universities. This study showed that although enjoying information technology considers as one of important tools of technology, it is very naively thinking that these tools and concepts are effective without regarding cultural and mental components and amount of acculturation related to information and communication technology and changing the culture of using internet and without controlling cultural officials on the process of e. learning,being unaware of the fact that all concepts and informational modern tools specially e. learning in their process of functioning and performing have mental and cultural concepts, values, attitudes and components.

Present study results are in line with results from Sadri Arhami (2003), MoayadNia (2007), Mahmoodi et al (2008). Easy (2007) and Kaponon (2008).

According to hypothesis 3, considering the data which approved by principals and Professors, social factor is one of important and effective factor on developing intelligent Universities which requires to create positive attitude in society about using information and communication technology and providing suitable fields for learning scientific skills of information and communication technology in society, although status and importance of intelligent Universities are not still revealed for families, providing methods for public acquaintance about the role of e. learning on learning- training process can considers as effective factor in accepting these Universities among families and their desire to send their children to theses schools in which this factor can develop intelligent Universities. The present study results are in line with the results of MoayadNia (2007), Mahmoodi et al (2008). Easy (2007), Howard (2008) and Kaponon (2008) .

About hypothesis 4, the study results showed that economic factor in each country is regarded as basic factor on supporting all developments in scientific fields…and without this factor, creating infrastructure or continuing path without supporting is impossible. Therefore, providing suitable fields of accessing to information and communication technology with low costs (availability to internet and computer technology) and increasing facilities and financial resources and also decreasing initial costs of developing e. learning in schools and financial help for families and trainers in order to provide electronic instruments and also providing costs for maintaining and keeping instruments in Universities and most important of all, coordination and investment of private sectors in the fields of e. learning and decreasing economic dependency to foreign producers of hardware can be considered as effective factors of employing new technology and developing intelligent Universities. Present study results are in line with the results from Sadri Arhami (2003), Salehi and Kashani (2006), Moayad Nia (2007), Mahmoodi et al (2008), Easy (2007), Howard (2008) and Kaponon (2008) .

In hypothesis 5, it is revealed that from principals and Professors point of view, technological factor is considered as one of the main effective factors on developing intelligent Universities. Considering that most activities of intelligent Universities are based on e. learning, this issue require internet and network with broadband, so, reinforcing information technology infrastructure (computer, telecommunication infrastructure) is very important and also, professional workforce for better employing of information and communication technology and preparing educational software in Persian language and spreading and developing educational internet sites in Persian language and creating e. library on developing intelligent Universities are very important. Present study results are in line with the results from Sadri Arhami (2003), Salehi and Kashani (2006), Moayad Nia (2007), Mahmoodi et al (2008), Easy (2007), Le Blanc and Wands (2001), Howard (2008) and Kaponon (2008).

Study results about hypothesis 6, showed that from principals and Professors point of view, legal and administrative factor considers as one of the effective factors on developing intelligent Universities. This survey considers legal and administrative factor as effective factor on using modern technology and developing intelligent Universities according to priorities of accuracy in references confirm content: Creating legal framework to support e. learning initiative plans, policy, guideline and executive laws reinforcement, creating intellectual property right, and reinforcing electronic security. Present study results are in line with the results of Mahmoodi et al (2008). Easy (2007) and Kaponon (2008).

About hypothesis 7, it is revealed that from principals and teachers point of view, strategy factor is one of effective factors on developing intelligent schools. According to this study, effective strategic factors in terms of priority are:

Increasing the recognition of high ranked officials about the importance of information and communication technology, precise planning in allocating priorities, strategies for informational development in country, creating strategy and general perspective in the field of information technology, presenting clear strategies for educational institutions and capabilities of institutions and Universities. Present study results are in line with the results of MoayadNia (2007), Mahmoodi et al (2008), Easy (2007), Le Blanc and Wands (2001) and Kaponon (2008) .

Recommendations:

Generally in all study results it is recommended that in order to develop intelligent Universities in country, telecommunication infrastructures and access to broadband must be improved in order to facilitate using network and internet in e. learning. On the other hand, general education should try to train professional workforce in the field of

information and communication technology in centers for teachers training and universities and developing the level of teachers and students knowledge and skills and also, government should create clear strategies on country informational development and provide proper financial support and acculturation and spread informing about e. learning and intelligent Universities in order to increase trust, confidence and rigidity about intellectual property right law and change policy and strategy for developing intelligent Universities. Also, using educational technologists for educational regular planning and presenting pedagogical approaches to increase present course content quality and developing e. learning are essential.

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