

### **RESEARCH ARTICLE**

# The Impact of the Process of Parboiling on Some of Texture and Milling Characteristics of Rice, Nemat and Fajr Verities

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### **ABSTRACT**

Parboiling is a technique that by physiochemical changes in rice seed can lead to texture changes and improvement of rice milling features as important for our country. At first, Selected paddy was soaked at three different temperatures 45 °C, 60 °C and 80 °C and then two steaming methods were selected as steaming under pressure 1 kg/cm² and steaming in atmosphere pressure 1 and and it was dried to 7% moisture and resistance to fracture in texture test was significantly increase (p<0.05) and in Fajr variety, resistance to fracture in control sample was 17.90N and in the best treatment, it increased 34.70 N and in Nemat variety increased from 19.23 N to 36.23 N and cracked paddy percent in Fajr variety was reached from 41.92% to about 15% and in Nemat variety from 43.51% to 10.15% in the best treatment and it reduced significantly (p<0.05) and fracture percent in Fajr variety in the best treatment was reduced significantly from 25.6% to 3.78% and in Nemat variety from 36.2 to 4.39% as (p<0.05) and the reason of the reduction of fracture percent is increasing rice resistance and eliminating seed cracks.

**Key words**: Cracked Paddy, Fracture Percentage, Parboiling, Physicochemical Changes of Rice, Rice Texture Test



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# INTRODUCTION

Paddy production was 3.3 million Ton in 2007, of which we had 2205000 ton white rice. The rice import is 0.5-1 million Ton annually and self-sufficiency in rice production is one of the strategic goals of our country but high production costs and drought we encounter reduced cultivation area of rice and caused the paddy land use (Faraji and DaneshiNavab, 2008; Nasiri, 2008; Jihad Keshavarzi Ministry, 2004). Parboiling by gelatinization of rice starch and elimination and filling rice seed cracks can increase seed resistance to the tension applied during milling operation and fracture percentage is reduced considerably and conversion percentage is also increased and due to the influence of bran into rice see, bran percentage is reduced considerably and it justifies the increase of conversion percentage (Naghavi, 2008; Ajai and Agun, 1989; Igathinathan and chattopadhyay, 2002; Ramachandra et al., 2000). Azizi in a study of Iran rice verities for parboiling referred to the fully positive effect of this technique on improvement of paddy indices and namely reduction of Iranian rice fracture percentage (Azizi, 1999). Grindy et al., in Egypt, defined two samples of long-grain rice (Arabi) and, short-grain rice (Nahada) in laboratory scale to determine the impact of processing under pressure, on quality of paddy threshing, which all characteristics of paddy threshing are improved ,during it, and this is especially true in variety of short-grain rice(Nahada), and with increasing the steam pressure to approximately (0-15 )kg/cm2) in steaming stage, the quality of threshing( recycling intact rice) is much more improved, too (Grinddy and Ashnawi, 1973). Priestley in India determined the impact of parboiling under pressure on starch solubility and relative transparency of seed in lab scales and evaluated that gelatinization and starch solubility in seed mostly depend upon steam pressure as 100% of gelatinization is obtained for 20 min under pressure 10 lb/ln2. Another point is that starch solubility is done 60min after full starch gelatinization. Also, crystallization of amylose complex is positively associated with starch formation during steaming process (Pristley, 1976). Ali and Battacharya in India in their studies as the effect of conditions in pressurized process on gelatinization transparency and cooking time and product color and intact rice recycling in lab scales showed that with the paddy humidity (12-30%) and increasing process time (5-80min)and increasing steaming pressure (0-3 kg/cm<sup>-2</sup>), all the mentioned indices are improved (Ali and Bhattacharya, 1982). UniKrishnanandBattacharya in India in lab studies regarding the determination of the impact of amylose on structural features of rice seed after cooking (soft and elastic) determined that paddy varieties with low to average amylose under steaming process had high quality compared to high amylose varieties. Ajayi and Agun in India determining soaking and steaming conditions in steaming process and showed that high temperature in soaking and increasing steaming time can lead to reduced fracture and inflation and water absorption in seed.

Igathinathane and Chattopadhyay (2002) applied 60, 70, and 80 C° degrees of a threshold , the higher the temperature, the lower the soaking time and, and end of soaking time was when humidity of paddies reached near 43.5% db. Moreover, steaming process was used for gelatinization of rice starch in an under-pressure situation (196.14, 147.11, and 198.07 Kpa) and timings of (300,600,900, and 1200 s), and drying rice seeds in 98 C° degree up to final humidity of 13.64%, under 98.07 Kpa pressure and 600 s timing, showed the brightest color of rice, without cracked, broken and turgid seeds. Saifullah et al., (2004) during parboiling rice and after texture testing with instran device, found out that the stiffness and resistance of rice seeds were increased during parboiling which was because of gelatinization of rice and that was why the resistance of rice was increased during paddy threshing. Vishal andHardeep proved that seed hardness performed by texture test was higher in brown rice than white rice and cooking time was higher in brown rice in minutes and Elongation during cooking was higher in white rice seeds and water absorption and elimination of solid materials during boiling in white rice seeds is higher and in texture Profile analysis (TPA), Cohesivenss, Springiness, Adhesiveness are high in white rice and hardness is higher in brown rice in texture test. Elbertand Tolaba in parboiling operation on rice at soaking temperature 70°C for 2hours and steaming for 10min in 198.53 found that increasing soaking temperature had negative impact on head rice and tempering time had positive effect and increasing soaking temperature had positive impact on browning and the resulting white rice is darker.Roy et al., (2006) for parboiling in modern methods applied soaking in hot water 55-70 C for 3-6 hours and applied cold water in environment temperature for 24-48 hours and in traditional methods applied sun drying for 1-2



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days based on the weather conditions.Ramachandra et al., (2000) applied soaking temperature of 65 C° for 6 hours, and after soaking, final humidity reached 30-35%, a situation in which timing of soaking should be long enough for the final humidity to reach this degree, and used under atmosphere pressure steaming in 90-100 C° for 5-60 minutes, and used solar drier with 26-28 C° for 18-24 hours up to final humidity of 3-7.7% for drying, and after drying was done, the produced rice was packed in poly ethylene bags and it was shown that, by increasing timing and steaming intensity, whiteness of rice seeds decreases, color value increases which is measured by hunter lab instrument, hardness which is measured in texture testing increases, and milling yield is increases (Ramachandra et al., 2000).

### **MATERIALS AND METHODS**

The requried paddy from Nemat and Fajr variety is supplied by national rice research institute- deputy of Mazandaran, and is fully verified by the standard. Before parboiling operation, it is cleaned and due to capacity 1Kg of paddy whitening system it is weighted and coded in 1kg scale (Azizi, 1999).

### Soaking

The purpose of this stage is to absorb water up to 42 %, and facilitate cooking and heat transferring during next stages. For soaking, three degrees of 45 C° for 6 hours, 60 for 4 hours which is bellow gelatinization temperature, and 80 C° for 1.5 hours which is above gelatinization temperature are used. For soaking, a steel 200 kg weighing double-walled cooking boiler, with water steam circulation was used (Azizi, 1999; Elbert et al., 2001).

### Cooking

The purpose of cooking stage is to complete parboiling operations and gelatinizing rice starch, which is done by two methods of cooking under pressure and cooking under atmosphere pressure, and vertical autoclave 500kg is used. In first method, after air exits, we set the steam pressure on 1 Kg/cm2 and for cooking we use cooking periods of 3, 5 min. For cooking under atmosphere pressure, cooking is for 5, 10, and 15 minutes and this operation is done in technical and engineering agriculture researches institution of Karaj (Azizi, 1999; Pristley, 1976; Soponronnarit et al., 2006).

# Drying

To dry parboiled paddy to reduce tension during drying, ambient temperature drying is used, during which, paddies are wide spread in a and final humidity reaches near 7 % as performed in technical and engineering agriculture researches institution of Karaj (Azizi, 1999; Roy et al., 2006).

### Peeling paddies

For this purpose, Testinghosker, THU 35B model, made in Japan in Mazandarandepty Rice Research Institute is applied (Azizi, 1999).

### Whitening paddies

The Whitener Seteka TM 05, made in US with maximum capacity of one kg, was whitened for 2.5 minutes and this operation was done in Mazandaran Rice Research Institute.



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### Texture test and determining elastic resistance of rice

In this test, hardness and increasing elastic resistance of rice seed after parboiling is measured. In this test, hardness and increasing elasticity resistance of rice seed is estimated after parboiling as done by Haunsfield texture test, H5K5 model in Engliand and deformation is 0.007mm/min with prob 1.5mm and load range is 0-100N and 2mm Test end Point (Soleimani, 1998; Mirhossein, 2000; Pillaiyar and Mohandes, 1989; Ramachandra et al., 2000; Saifullah et al., 2004).

### Determining the percentage of cracked seeds

In the test of estimation of cracked seeds percentage, crack device of rice researches institution of Mazandaran Deputy is used (Mirhossein, 2000; Igathinathan and Chattopadhyay, 2002).

### Fracture percentage

we take 40 gr of white rice, separate cracked seeds which are less than ¾ an intact seed with hands, and we calculate the fracture percentage in this 40gr and then fracture percentage in total white rice is calculated and finally fracture percentage in initial paddy is estimated (1, 2, 5, 6).

### Statistical method

For statistical analysis, fully random factorial design 2\*3\*5 in three replications by Sas software is used.

### **RESULTS AND DISCUSSION**

# Simultaneous effect of control and treatments of varieties, soaking temperature and steaming condition

Parboiling is one of the techniques in rice technology and by some changes in physicochemical features of seed is the factor of many good features in rice and by investigation of these physicochemical changes in rice seed we can find about the reasons of creating these good features and to create good conditions and high cooking quality product and good milling indices, we can create better conditions. In this technique by gelatinization of rice starch and elimination and filling rice seed cracks after drying, physical resistance of seed to breaking is increased during mechanical tensions and the rice seed is broken less. To investigate the fracture percentage, at first we should estimate the rice seed resistance and measure the percentage of cracked seeds as the main factor of rice fracture during milling can be measured.

### **Texture test**

As shown in Table 1, in texture test, except the effect of treatments of soaking temperature and steaming conditions as significant at level 0.05, the mutual effect of variety treatments and soaking temperature and steaming conditions are not significant in this test and the effect of other treatments is significant at the level 0.001 and shows the effective impact of this technique on this test. As shown in Table 2, both varieties in parboiling operation the increase of seed resistance to fracture force compared to control case was observed and all treatments had significant difference with the control group and the difference between two control samples in two varieties is not significant. In Fajr variety, fracture force is increased from 17.90 N to 34.70N at soaking temperature 80°C and steaming under atmosphere pressure for 10min and in Nemat variety, it is increased from 19.23 N at the best treatment to 38.75 N at soaking



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temperature 60°C and steaming under atmosphere pressure was increased for 15min and the resistance of fracture force is doubled. As Nemat variety has high amylose and long grain and thicker than Fajr variety with medium amylose and grains and it has loose texture than Nemat variety and shows less resistance to fracture force. Thus, parboiling has significant effect on resistance and texture of rice seed in both varieties.

### The percentage of cracked seeds

Crack in rice seed starts from the field and environmental tensions as the difference of night and day temperature, dew and dryness in high heat of summer, over ripening of paddy in field, dryness, pests and diseases, unsuitable devices of harvesting and transportation and unsuitable dryers are the cracked seeds factors in rice and they are shown as broken seeds during milling.

As shown in Table 1, the mutual effect of variety treatments and steaming conditions, mutual effect of soaking temperature treatments and steaming conditions and mutual effect of variety treatments, soaking temperature and steaming conditions on this test are not significant and the mutual effect of steaming conditions is significant at the level 0.05 and the effect of other treatments is significant at the level 0.01.

As shown in Table 2, cracked paddy percentage in both varieties is reduced compared to control samples and they have significance difference. In Fajr variety, cracked paddy percentage is reached from 41.92% to 15-16% in all treatments and soaking temperature to 45degree. In Nemat variety, in control sample 43.51% of paddy are cracked indicating the low quality of paddy in both varieties in terms of cracked nature and during parboiling and it reaches 10.15% in treatment and soaking temperature 60degree and steaming under atmospheric pressure for 15min and it is good and among two varieties in control sample, Nemat variety had high cracked paddy percentage but in parboiled samples, Nemat variety in similar treatments with Fajr variety showed low cracked paddy percentage and it showed the high effect of this treatment on Nemat variety.

### Fracture percentage

As it was shown, in parboiling, the resistance to fracture is increased and cracked paddy percentage is reduced. We should expect the treatments with the lowest cracked seeds percentage and highest resistance in texture test have lowest fracture percentage.

As shown in Table 1, the applied treatments and their effect have significant effect on milling indices namely rice fracture percentage. Generally, except the mutual effect of variety treatments, soaking temperature and steaming conditions as significant at the level 0.05, the effect of other treatments on rice fracture is significant at level 0.001.

As shown in Table 2, fracture percentage in Fajr variety and control is 25.60% and in Nemat and control sample 36.20% and as you observe, fracture percentage in Nemat is higher and during parboiling in Fajr variety, all treatments to control sample had significant difference and the lowest fracture percent is 3.78% and in soaking temperature 45 degree treatment and steaming under atmospheric pressure is for 10min and in this treatment, the resistance to fracture force is 32.63 N and it is the highest resistance in this variety as 34.70N and has no significant difference and percentage of cracked paddy in this treatment is 15.14% and in soaking temperature treatment 45 degrees and steaming under atmospheric pressure for 10min and all treatments of soaking temperature is 45 degree and in this variety has the lowest cracked rice percentage and has no significant difference and the treatments with the lowest cracked paddy percentage and highest resistance have lowest fracture percentage. In Nemat variety, fracture in control sample is 36.20% and during parboiling the best treatment is reduced to 4.39% and the treatment of soaking temperature is 60°c and steaming under atmospheric pressure for 15min and this is the treatment with highest resistance to fracture force 38.75 N and the highest resistance to total varieties and has significant difference



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with all treatments and lowest percentage of cracked paddy in total two variety treatments as 10.15% is observed in this treatment and it shows direct effect of these two rice texture factors on fracture percentage.

Finally, based on the fact that in Fajr variety, fracture percentage is reduced from 25.60% to 3.78% and in Nemat variety, facture percentage is reduced from 36.20% to 4.39% and we can say this technique has high effect on Nemat variety.

### **DISCUSSION AND CONCLUSION**

This study evaluates the impact of parboiling technique on various treatments on increasing rice resistance during texture test and cracked paddy percentage and finally fractures percentage.

The results of study show that various treatments during parboiling has significant impact (p<0.05) on texture test and based on Duncan test, it is shown all treatments had significant difference to control samples. Also, we can refer to Saifullah et al. study who proved that parboiling technique effectively can increase resistance of rice during texture test and the reason is gelatinization of rice starch during parboiling. Also, Vishal andHardeep reported that the rice of parboiling has stable texture and during texture test, it has high resistance to fracture. In another study Ramachandraet al., referred to the positive effect of this technique on increasing rice seed resistance. Starch gelatinization of rice can tie the rice seed in the points with crack and there is significant reduction between cracked paddy percentage (p<0.05) and the impact of variety treatments and soaking temperature and mutual effect of these two treatments on this test at probability level on this test is significant at probability level 0.001 and regarding steaming conditions treatment, at probability level 0.05 is significant and in Duncan test, all treatments in both varieties had significant difference with control sample and it showed positive effect of this technique on cracked paddy percentage. Chattopadhyay and Igathinathanein a study referred to the impact of parboiling effect on reduction of cracked rice percentage.

Fracture percentage as the most important rice milling index in parboiling process is reduced and it can be said the impact of all treatments on this index at probability level 0.001 is significant (p<0.05) and the difference between all treatments with control samples in both varieties is significant and it shows the considerable effect of this technique on rice fracture. Azizi in a study proved that parboiling can reduce Iranian rice fracture as considerably. Also, Grindy et al., in lab scale determined that all features of paddy threshing are improved in this process and this is mostly observed in Nahada seed.

Ajayi and Agun determining soaking and steaming conditions in steaming process and found that high temperature in soaking stage and increasing steaming time can lead to reduction of fracture. All and Battacharya in their studies regarding the impact of conditions on under pressure process on gelatinization transparency indices and cooking time and product color and intact recycling at lab scale showed that with the increase of paddy humidity (12-30%) and increasing process time (5-80min) and increasing steaming pressure (0-3 kg/cm<sup>-2</sup>), all indices are improved.

Finally, we can say that based on high facture percentage of rice in milling and the impact of this technique on reducing rice fracture percentage and its development in rice-field countries, we should implement this technique in milling of our country.



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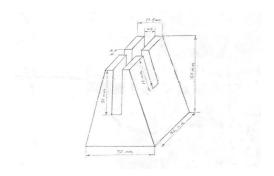


Figure 1- Basic perspective to determine fracture force



Figure 2-Crack test to determine the percentage of cracked seeds



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Table 1- The analysis of various treatments variance on tests

Mean Treatment	Texture test	Percentage of cracked seeds	Fracture percentage
Variety	*** 358.481	*** 409.813	***24.95346478
Soaking temperature	34.727	***8.314	*** 6.04053778
Steaming conditions	123.213	*1.057	*** 155.39906778
Variety *soaking temperature	9.072	*** 4.575	*** 127.78493778
Variety*Steaming conditions	30.654	Ns <sub>0.198</sub>	*** 51.22036778
Soaking temperature*steaming conditions	* 1.920	Ns <sub>0.046</sub>	*** 2.89005028
Variety *soaking temperature*steaming conditions	0.613	Ns <sub>0.074</sub>	*1.89097528
Error	0.795	0.400	0.67146444

Table 2- Comparison test of mean by Duncan method for simultaneous effect of control and variety treatments and soaking temperature and steaming conditions on variables

Treatment Mean	Texture test	Percentage of cracked seeds	Fracture percentage
Fajr-45°C×Atmosphere 5 min	r 25.913	<sup>ij</sup> 15.640	<sup>ef</sup> 11.780
Fajr-45°C×Atmosphere 10 min	<sup>hijk</sup> 32.633	<sup>j</sup> 15.140	<sup>n</sup> 3.780
Fajr-45°C×Atmosphere 15 min	<sup>kImn</sup> 31.146	<sup>ij</sup> 15.720	<sup>Im</sup> 5.770
Fajr-45°C×1kg/cm2 pressure for3 min	<sup>no</sup> 29.613	<sup>hij</sup> 15.950	<sup>kI</sup> 6.840
Fajr-45°C×1kg/cm2 pressure for 5min	<sup>qr</sup> 26.220	Hij16.330	<sup>ij</sup> 8.510
Fajr-60°C×Atmosphere 5 min	<sup>qr</sup> 26.700	<sup>d</sup> 16.480	<sup>e</sup> 11.500
Fajr-60°C×Atmosphere 10 min	<sup>ghij</sup> 33.196	<sup>def</sup> 18.120	<sup>ij</sup> 8.350
Fajr-60°C×Atmosphere 15 min	<sup>jkl</sup> 32.180	<sup>de</sup> 18.820	<sup>hi</sup> 9.450
Treatment	Texture test	Percentage of cracked seeds	Fracture percentage
Fajr-60 <sup>10</sup> x 1kg/cm2 pressure for 3 min	<sup>no</sup> 29.810	<sup>de</sup> 19.040	<sup>fgh</sup> 10.670
Fajr-60°C×1kg/cm2 pressure for 5min	<sup>pq</sup> 27.783	<sup>de</sup> 19.270	<sup>efg</sup> 11.250
Fajr-80°C×Atmosphere 5 min	<sup>pqr</sup> 27.540	<sup>c</sup> 23.180	<sup>d</sup> 14.880



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Fajr-80°C×Atmosphere 10 min	<sup>defgh</sup> 34.700	<sup>c</sup> 22.130	<sup>ij</sup> 8.990
Fajr-80°C×Atmosphere 15 min	<sup>ijk1</sup> 32.233	<sup>c</sup> 21.640	<sup>ghi</sup> 99.740
Fajr-80°C×1kg/cm2 pressure for 3 min	<sup>Imn</sup> 30.750	<sup>c</sup> 22.830	<sup>fgh</sup> 10.890
Fajr-80°C×1kg/cm2 pressure for 5min	<sup>op</sup> 28.936	<sup>c</sup> 22.920	<sup>e</sup> 12.700
Control Fajr	s 17.909	<sup>b</sup> 41.920	<sup>b</sup> 25.600
Nemat-45°C×Atmosphere 5 min	Pqr <sub>27.430</sub>	C <sub>22.790</sub>	C <sub>20.320</sub>
Nemat-45°C×Atmosphere 10 min	Jklm <sub>31.533</sub>	C <sub>22.530</sub>	D <sub>15.700</sub>
Nemat-45°C×Atmosphere 15 min	Ab <sub>37.470</sub>	C <sub>21.850</sub>	KI <sub>6.260</sub>
Nemat-45°C×1kg/cm2 pressure for 3 min	Fghi <sub>33.850</sub>	C <sub>21.940</sub>	Fgh <sub>10.710</sub>
Nemat-45°C×1kg/cm2 pressure for 5min	KImn <sub>31.296</sub>	C <sub>22.160</sub>	E <sub>12.780</sub>
Nemat -60°C×Atmosphere 5 min	Lmn <sub>30.666</sub>	K <sub>11.320</sub>	D <sub>14.570</sub>
Nemat -60°C×Atmosphere 10 min	Defg <sub>34.766</sub>	K <sub>11.140</sub>	Fgh <sub>10.680</sub>
Nemat -60°C×Atmosphere 15 min	A <sub>38.753</sub>	K <sub>10.150</sub>	Mn <sub>4.390</sub>
Nemat -60°C×1kg/cm2 pressure for 3 min	Bcd <sub>36.236</sub>	k <sub>10.630</sub>	jk <sub>7.650</sub>
Treatment Mean	Texture test	Percentage of cracked seeds	Fracture percentage
Nemat 60 C×1kg/cm2 pressure for 5min	Cdef	V	li
Nemat 60 Cx rkg/cmz pressure for smill	Cdef 35.496	K <sub>10.950</sub>	lj <sub>8.780</sub>
Nemat -80°C×Atmosphere 5 min	Mno <sub>30.213</sub>	Efg <sub>17.830</sub>	D <sub>15.310</sub>
Nemat -80°C×Atmosphere 10 min	Efgh <sub>34.236</sub>	Fgh <sub>17.380</sub>	Fgh <sub>10.790</sub>
Nemat -80 <sup>®</sup> C×Atmosphere 15 min	Bc <sub>36.853</sub>	Hij <sub>16.220</sub>	Lm <sub>5.536</sub>
Nemat -80°C×1kg/cm2 pressure for 3 min	Cde <sub>35.730</sub>	Ghij <sub>16.640</sub>	lj8.640
Nemat -80°C×1kg/cm2 pressure for 5min	Defg <sub>34.700</sub>	Fghi <sub>16.950</sub>	Ghi <sub>9.780</sub>
NematcontorI	S <sub>19.230</sub>	A <sub>43.510</sub>	A <sub>36.200</sub>

In each column similar alphabets show the lack of significant statistical difference at level 5%.



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### **RESEARCH ARTICLE**

# Liquidation of the Bank Guarantee

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# **ABSTRACT**

Bank guarantees have been emerged due to the needs arising from business exchange and interaction and in the field of trade and economic globalization, many countries are moving at a rapid pace by adopting this model of business in order to grow and develop their business. Iran seeks to prepare the space for improving economy eliminating the disadvantages of the model, adopting rules in this regard, and its presence in the global business arena. Vision 1404, which makes Iran a developed country with first place in the region in terms of economy, science and technology, has been approved and promulgated in this regard. This must be carried out with understanding of the concepts and relationships of a multipolar world trade as well as business analysis in order to join the World Trade Organization. However, in the realm of international trade, bank quarantee is the most common collateral for warranty and quaranty obligations; although it is he foundation of modern business, there is not a single agreement in this regard in international trade rights and judicial procedure. The nature of bank guarantees has been interpreted in different ways in Iran. With the advent of bank guarantees in Iranian trade, many interpretations have been emerged regarding its nature and proposed commercial contracts. Some believes that bank guarantee is unilateral obligations, contractual liability, commitment on behalf of a third party, or contracts under the examples of Article 10 of the Civil Code. All these analyses are presented to comply the new law and to join international trade with he principles of Islamic Jurisprudence as the main source of Iran law.

**Key words**: bank guarantee, letter of credit, liquidation of bank guarantees.



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#### **Bank Guarantee**

Bank guarantee is irrevocable obligation of a bank to pay guaranteed money in the case of non-fulfillment of obligations under the contract by a third party (supplier or committed of the contract). Lawyers have presented different definitions of this new legal document. For instance, it is a regular or formal entries containing contract of guaranty or commitment in any form like a warranty through which one promises to a by his noble hinesty to be released. In the guarantor is an individual, the guarantee is personal and if a bank accepts the liability, it is called bank guarantee (Jafari Langroodi, 1999. Vo. 3, p. 2421). In this definition, the concept of guarantee goes far beyond financial commitment and it is close to such institutions as bail and mortgages. With the scrutiny of bank guarantee and relations between the parties of this commercial document, it is said that the mentioned definition is too general and does little to do with this document. In another definition, bank guarantee is defined as an individual's commitment (the guarantor) for accountable for another person (the debtor) to a bank when he is failing (Thomson, 1957: 244). This definition of guarantee is true when a person introduce one to a bank provide collateral to the bank. In addition, bank guarantee is defined as a subsidiary and consequential commitment through which one undertakes to be primary accountable for any failure or violence by the guaranteed (Ibid: 244).

In a bank guarantee, the main parties to the relationship are two or three persons. The parties of a simple guarantee are guarantee applicant (debtor), issuer of the document (guarantor), and beneficiaries of warranty (obligee). By referring to a bank, one requests the issuance of guarantee and the bank issue the guarantee payable to beneficiary according to the request, determining the validity of guaranty, and its terms. In international guarantees, bank does not directly issue the guarantee, but it is issued for a bank in the target country (mutual guarantee) and the second bank issues a guarantee on the account of the source country (original guarantees) for the beneficiary; in this manner the guarantee is called 'mutual guarantee.' With these qualities, the definition of the bank guarantee has been proposed as a contract r document by which the issuer (guarantor) commits to beneficiaries of warranty (obligee) upon the request of the applicant (debtor) that he will, transfer, a certain amount of cash for a specific subject related to debtor in cash or in remit (Akhlaghi, 1989: 156).

### Liquidation of the Bank Guarantee

Before everything, it should be said that guarantee is in fact a document suggests the interests of a third party. According to this idea, it is assumed that the contract upon which the guarantee is issued is a contract between guarantor and the principle in such a way that the beneficiary is a third part while it is expected that a contract should be between obligee and guarantor. This contract has no connection with the basic contract, but it is an independent contract between the principle and guarantor. Primarily, it means that with the current condition, submission of mentioned guarantee is consistent with the basic contract as well as legal obligation to provide warranty because the principal, or the party of the basic contract, is committed to provide a guarantee for interest of a third party (beneficiary of the contract). So is practically; the contract party or principal, or employer, asks another party, or contractor, to submit the bank guarantee from a valid bank regardless of their relationship with the bank.

Theoretically, the foundations of this analysis are Articles 231, 196, and 241 of Civil Code. Article 213 of the Code stipulates, "Undertakings or contracts are only binding on the two parties concerned or their legal substitutes except in cases coming under Article 196." Article 196 says, "Anyone who makes a contract it is deemed that he is acting for himself unless in making the contract the contrary is laid down or unless subsequent evidence to the contrary is established. When making a contract, however, anyone can make provision for the benefit of a third person." In addition, Article 241 adds, "In a contract it may be specified that one of the parties should give security or pledge for the fulfillment of his obligation." This expressive opinion answers many questions because: First, it is more consistent with the manner of issuing guaranties and its mechanism. Second, there is no problem such as offer and acceptance manner.



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Third, it provides principal's rights in better ways because the bank's guarantee is fulfilled in favor of obligee with the conclusion of contract between guarantor and the principal; in this regard, the latter termination of basic contract between guarantor and principal has no effect in the right generated in favor of the obligee. Fourth, in the case of non-compliance of guarantee with the terms accepted by the obligee, he is not faced the problem in contract termination. According to the theory of commitment in favor of a third party, legal relations of the parties to the bank guarantee can be described as follows:

### The relationship between guarantor and the principal

In bank guarantees, the contract is in fact concluded between guarantor and the principal and the guarantor bank attempts to issue a guaranty based on the applicant's request whereby a right is created for a third party (obligee). The parties of this contract cannot remove the rights of third party by terminating the contract. The warrabty is supported by collaterals and obligations given to bank by the principal; according to the concluded contract, the guarantor cannot refer to the principal. This is resulted from the direct secondary relationship of guarantee to the initial commitment because the generated guaranty is suspended to the implementation of the commitment mentioned in the basic primary contract. Therefore, after the payment of the guarantee, the guarantor bank can use the available guaranties to meet its demands due to non-fulfillment of the contract, or it can refer to the principal or bring an in action against him.

### The relationship between principal and the obligee

Basis for the issuance of the guaranty is the basic contract whereby the parties to the contract accept some rights and commitments. In this primary contract with non- guaranty relationship, the parties are not generally titled as principal and obligee, but they are employer and contractors or committed or promisee based on the situation. The initial contract defines amount, type and subject of the contract that should be submitted to contractor, future obligee by the employer, or the principal.

### The relationship between guarantor and the obligee

No contract is in fact concluded between guarantor and the obligee in bank guarantees, therefore, offer and acceptance is not relevant about their relationship. In some cases, this guaranty is assured by the expression "I accept it" or a similar concept in the warranty. This does not mean 'acceptance' and 'offer' in literal terms are necessary to fulfill the contract, but it signifies obligee's confirmation that the provisions of warranty comply with the provisions of basic contract although most warranties does not rely on this meaning. The theory of commitment in favor of a third party covers this legal condition and gives some rights to the obligee who has acquired a guarantee for his action; this right has no difference with the rights resulted from the contracts in ordinary cases and has all bindings of all contracts. Thus, the obligee can employ all tools used by other creditors to force the debtor.

With theses lines, some types of bank guarantees cannot be included in contract of guarantee; when it is subjected to a future debt, providing probable losses of failure to perform the contract, or it is suspended obligation, it should follow the provisions of contracts, Article 10 of Civil Code, a contract subjected to commitment in favor of the third parties. However, now the question is whether this commitment and engagement like contract of guarantee is accessory obligation or independent obligation. Since bank guarantees are usually listed in letters of credit, according to general principle and conventional practice of banking, it cab be argued that the guarantees follow the principle. Thus, its beneficiary or obligee that has a document without stipulation can demand payment from the guarantor bank without the need to prove something. Some consider separation and independence from the basic contracts as the prerequisite for bank guarantees and they argue that the aim of presenting bank guarantees is granting maximum security and assurance to stakeholders to be able to claim for future debt or losses from the quarantor bank



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regardless the basic contract by just demand in his discretion. Otherwise, the obligee should prove the guilt of the contract party in a competent court through adjusting a lawsuit against guaranter or the principal. In this case, the guarantee's prerequisites were eliminated and it would not be able to play its role as means of ensuring the enforcement of contracts. Although this idea and argument is valid in terms of contractual rights and banking transactions, it is not absolute in the actual context. In other words, although banking guarantee is apparently an independent and obligatory banking document, it is a wide translation of legal relationships between two persons (such as an employer or contractor), which is derived from the basic contract. Therefore, any dispute concerning the guarantee is an accessory from the basic contract and it should inevitably be examined in relationships contracts.

In this case, one can use the accessory aspect of guarantee contract in Civil Code. In Civil Code, warranty is an accessory contract; it does not mean that its conditions and effects is subordinated to another contract, but it means that the guarantor's commitment in terms of effect and validity depends on the dept of the principal to creditor. The nature of contract guarantee requires the guarantor's commitment whether the guarantor undertakes financial obligation of another person or he regards the generated payment as the present debt even if the proving conditions have not been fulfilled by creditor. Accessory state of warranty requires important effects and consequences as the following: The guarantor has no independent debt to the obligee and ha undertakes the debt of obligee; therefore, if liquidation of the basic debt is proved, the warranty will be proved. The guarantor undertakes the obligee's debt with its specific terms and conditions; therefore, any type of objections and defenses related to the transferred debt such as delivered over time, fulfillment of debt by the principal, or termination of basic contract can be used by guarantor. The guarantor undertakes the debt of principal comply with the basic contract; thus, when the basic contract is terminated, the guarantee will be eliminated because resigning obligation to its place, removal of the principal's debt and the obligee's demand falling are regarded as solvency of the debt by principal. In other word, after termination of the basic contract, the oblique has no debt to ask from guarantor and the warranty's base is removed. The bank guarantee has also the same situation and the principle of independence of guarantee from basic contract is not valid in the law of some countries, but the guarantee, like contract of guarantee, has accessory obligation and is subject to its effects. Therefore, when termination of basic contract, its revocation, or its implementation is proved, the bank guarantee is also resolved and the bank can apply any objection or defense related to the guaranteed subject such as problems in the fulfillment of obligations or good performance of obligations and the like. This interpretation is consistent with the legal nature of the bank guarantee because the guarantee is a translation of basic contract, subordinate to its existence, and the guarantor bank is the deputy of main debtor, or the principal. Both order of non-payment of the guaranty issuance by the contractor and payment demand of the employer by the employer are in fact implying the performance or non-performance of contract obligations, or failure to perform its obligations efficiently.

Therefore, it is necessary for parties to address their claims directly to each other instead of any action against guarantor bank that has a mediatory and secondary role in the contractual relationships. In this regard, they are able to clarify the task of of cases, including the warranty by addressing the rights and obligations under the main contract. Although this solution is not consistent with the natural principle of document independence, value, and validity, and leads the action from simplicity to complexity, the independence is relative. The observance of warranty's accessory aspect assures the benefit that the warranty's obligee can raise all aspects of this complex legal-banking proceeding to deal and obtain a favorable result in a single competent authority. The issuance of bank guarantees should be investigated to comprehend this theorem. It must be said that the principal's request is the source of bank guarantee issuance (Masoudi, 2012: 100). It means that the obligee requests the presentation of bank guarantee from the principal. According to contractual relationships, this emerges between the principal and the obligee whereby the principal presents a guaranty to assure the payment of some of his obligations in the mutual agreements. From this perspective, it should be studied whether bank guarantees are issued by banks and the principal undertakes an obligation by accepting it or the warranty contract is concluded between the principal and guarantor bank in such a way that bank undertakes some obligations of the principal towards the obligee (ibid: 100)



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In civil guarantee, the existence of the principal is not necessary, his consent is not required, but the presence and of the principal (real debtor) is necessary in bank guarantees. Actually, the agreement between the principal and the quarantor creates the warranty.

### The relationship between bank and the principal

The major relationship in bank guarantee is the relationship between bank and the principal. In fact, the principal goes to the bank and requests the issuance of a guaranty in favor of a beneficiary according to his contracts with the beneficiary due to the commitment generated based on acquirement and presentation of the guarantee. In return for the acceptance of this guarantee, bank does get commissions from the principal. In return, the principal gives a warranty to the bank and he is obliged to pay the accrued commission. When they are located in one country, their relationship is loca and domestic (Bertrams, 1998: 115). In the Netherlands and Germany, the relationship between the principal and the bank is called an advocacy. England law has also categorized this under the title of advocacy. Nevertheless, some Belgian authors have rejected the advocacy theory in their country. In French, this relationship is called advocacy, providing service, or credit extension ibid: 116). It must be said that the advocacy theory is not illustrative about the relationship. Bank should issue the guarantee with the method in accordance with the terms of which it has been ordered. At payment, the fulfillment of payment provisions should be investigated (Massoudi, 2013: 103). In the case of crisis in the principal's contractual relationships with the obligee, and when he feels that the obligee tries to get more than his proper right, the principal can prevent the obligee to interfere the guarantee with provisional order to the guarantor bank. In ordinary situation, if the obligee does not request for guarantee payment and does not request for its extension, the warranty becomes canceled (ibid: 103). In this case, the principal is committed to return immediately the exact amount that has been paid by bank according to the previous agreements.

### The relationship between the guarantor bank and obligee

There is no primarily direct relationship between bank and obligee. The guarantee is requested by the obligee from the principal; the contractual relationships between the principal and bank result in the issuance of guaranty and it is submitted to obligee by the principal. Guaranty is exigible as soon as it is issued, but the contract provisions may prorogate the guaranty's ability to fulfill immediately while the guaranty text may introduce it as demand bill. For instance, the principal can defines a specific time for implementation of the quaranty, or he may declare that it is not exigible before a specific date, or he may mention some provisions for the demand of its charge. For example, it may be mentioned that the contract is enforced subject to an advance payment (Bertrams, 1998: 2). The postponement of guaranty enforcement should not be misunderstood with suspension. Since Article 699 of Civil Code regards postponement of guaranty as a term for its termination, the accuracy of this agreement is questionable. In this condition, as Article 723 has allowed, the original guarantee is not suspended, but the payment obligation that is the result of guarantee is suspended to another affair. The second paragraph of Article 7 in United Nations Convention, the issued guaranty is considered irrevocable and there is no need to mention the expression in the guaranty. Contrary to the United Nations Convention, it does not allow the insertion of unlawful condition (Masoudi, 2012: 107). In third paragraph, the issuance date is regarded as the date in which the beneficiary can claim payment. Of course, it is stipulated that this time can be started from another date or the occurrence of en event predicted in the guaranty. The guaranty beneficiary should demand the payment according to his agreement with the principal or he can request for extension at the end of the warranty period. In the case of non-fullfillment of a provision, the guaranty is void the relationship between bank the obligee is finished. If the bank refuses to pay the guaranty fee, or when the principal prevents any payment through a provisional order, the obligee can go to court to demand for warranty payment (ibid: 108).



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### The relationship between obligee (beneficiary) and principal (principal debtor)

The basic contract upon which the guaranty is issued to assure its provisions is concluded between obligee and principal. The survival of the guaranty depends on this contract and everything depends on the particular conditions contained in it. Indeed, guaranty is the product of this contract. Bank is considered as a third party between these two parties. The third party that assures the performance guarantee of some parts of the contract or it adjusts contractual obligations of the principal. In the relationship between the principal and obligee, the principal asks the obligee to present a bank guarantee for the assurance of enforcement of whole or a part of contract provisions and the obligee goes to the guarantor bank and gets such guaranty. If the obligee fails to enforce the provisions of concluded contract, the principal fails, or the provisions of the contract does not fulfill, the obligee can ask the bank to pay his guaranty charge.

### **Nullity of bank guarantees**

Commitment among the parties is one of the foundations acceptance and durability of bank guarantees. The basic commitment of these guarantees can be categorized in two general types: Commitment to do the task in itself.Enforcement of the task respectively according to the provisions agreed in the basic contract.Bank guarantees issued in these cases are mostly committed to pay a specific amount of money to obligee or employer without any conditions merely by his demand when the principal or contractor have not finished a promised practice at the stipulated time in accordance with the provisions and conditions of the contract and in conformity with work technical specifications. Due to the descriptions of guarantee contract and its subject that is guaranty a debt, it is far to regard these guaranties as an instance for such contract. Some believe that these contracts are instances for "warranty for an unproven obligation" or debt guaranty whose provisions have not been fulfilled yet. They argue that bank assures some future losses whose reasons is not available by issuing guaranty for fulfillment of obligations, especially the performance bond guarantee of obligations. Hence, this it is void according to the concept of Article 691 of the Civil Code. Many attempts have been carried out to correct the problems and avoid the invalidity of such guarantees.

According to some authors of civil rights, obligation to pay a potential debt in future so that it brings an obligation depends on the fulfillment of the main debt is legally true because if we allow the suspension, there is no difference between non-payment of a debt and fulfillment of the debt. Particularly, suspension is carried oud based on an obligatory provision and the committed party accepts to pay it. To say that, the difference between the mentioned obligation and guaranty is related to the fact that no credit transfer has been occurred. The debt is created under the responsibility of main debtor and the commitment for payment is a debt given to potential creditor. This obligation is not a guaranty, but Article 10 of the Civil Code is effective in this regard. Accordingly, the committed party should not be regarded as the guaranty of contract in contractual obligations of performance guarantee and his relationship with creditor is analyzed based on guaranty provision because the debt undertaken by him did no existed at the contract time and the debt cause not only is not contract but also is a collection of conclusion and fault of the offender. According to these authors, it seems certain in final analysis that the commitment stated in these contracts should not be considered void; if it brings debt, it is bond and when it is known as future debt, it should be regarded as a suspended obligation subject to the general rules of civil law contracts and Article 10. This item is sometimes difficult to be verified and requires careful analysis of the legal action. The analysis answers the main problems in bank guarantee compliance with contract of guarantees by expressing the causes of debt. In other cases, general rules of civil law contracts and Article 10 are useful, but it does not define exactly the parties of the contract; it refers mostly to a guarantor contract between the guarantor and the obligee. However, in many present bank guarantees, the obligee is not a party of contract with bank, but he requests the principal party a valid bank guarantee from a valid bank. With these problems, some scholars try to solve them in other waysIn order to present a clear and detailed discussion; we stated some regulation of Sina Bank about liquidation of bank guarantees.



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### Terms for liquidity of guarantees

Guarantees are voidable in the following cases.

- 1. Warranty maturity expiration and failure to request renewal by obligee.
- 2. Presentation of guarantee form together with the obligee's written letter indicating the liquidation of guarantee.

To maintain valuable customers, branches can regenerate guarantees as follows.

- A. If no command of extension / liquidation / registration and payment by the beneficiary is delivered to bank by the principal, the guarantee will remain in current guarantees for 15 days.
- B. If no request for determining the situation of guaranty has arrived after 15 days, the guaranty will be suspended from the sixteenth day; it is will be deducted from obligations' account and transferred to the provisional creditors account.
- C. Suspension period for warranty is 30 days. Therefore, branches can attempt to regenerate the guaranty according to applicable regulations during this period.
- D. If no one seeks extension to 45 days after maturity, the guaranty is liquidated with the approval of the branch officer.

After guarantee liquidation, the issue is informed to guarantee parties in a written letter and the cash deposit and its collaterals are delivered to the customer with the head of the branch's order and assuring the settlement of deferred liabilities. Commission does not paid to guarantees that have voided after maturity and the obligee refuse to send the document. Bank refuses to refund the documents to the principal, but if the provisions of reviving guarantee are presented, the commission of guaranty should be obtained from the letter previous maturity. The commission for issuing receipts at liquidation before maturity is calculated considering the used terms and one month in favor of bank and the difference is refundable. In addition, the minimum commission fee for issuance of guarantee is refundable at any situation.

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**RESEARCH ARTICLE** 

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# **Evidences: A Comparative Study in the Criminal Law of Iran and France**

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# **ABSTRACT**

Thisarticleisacomparativestudy aiming to compare thelegalevidencesofcriminal lawin Iran and France legal system. This study explains characteristics of evidence and the foundations of their differences. In terms of social reality, the legislative history and judicial procedure, legal resources, and persuasive systems, laws are different in Iranand France. Hence, they also vary in the definition of legal evidence, characteristics, and nature. In this article, maindifferences are classified to be explained. This article is useful for researchers who try to research about evidences inIranianandFrenchlaw.

Key words: irrebuttable presumption, judicial circumstantial evidence, features and principles of difference, criminal law

### INTRODUCTION

Legal evidences using to prove a claim in court are in fact employed to finding out the truth in legal systems. In the legal systems of Iran and France, legal evidences are used in thejudicial proceduresforinvestigation and litigation in courts. Apart from all legal definitions, these two systems put less emphasison the conscience of thejudge for obtaining judge's sentence. Sinceto prove a claim are not prepared and arranged before commission of the offense in penal lawsuits, the offenders mostly try to eliminatethe causes if they can. Therefore, the judge must expediteand hurry in providing in criminating evidences. It can be seen that judge searches absolute material factor reality in criminal law. The delicacyinhandlingcriminal law as well as differences inlegal conceptslikethe concept ofcauses, juridical mark, persuadingthe judge, difference between legal judge and criminal judge, and differences in legal basisof Iranand France requires comparativestudies in this regard. In French law, reason is regarded as the meaning of mark and witness. In this criminal legal system, reasonis considered in its general sense; thus, adduce is



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defined as, "providing a means to convince judge that a claim is true." However, the term reason is employed in French law to show, realize and discover reality. In French legal courts, judge tries to dig out and extract the absolute truthregardless ofdeceiveappearances of the presented evidences. Given the evidence, it can be seen that Iranand France have some similarities and differences in legal literature; judicial procedures and the role of legal judge and criminal judge follows the same pattern. These similarities and differences motivate the researcher to work on this issue. Therefore, this article investigates comparatively the differences in the attention of these two legal systems to each of legal evidences and foundations of differences.

### Definition

Evidence refers to circumstances that are going to prove an action for judge or law. Irrebuttable presumptions are signs having been considered as a cause due to the firm stipulation of the legislatorsand judicial evidences are signs referring to an affair for the judge and convince him to issue a sentence, irrebuttable presumptions have only proving role and solve the problem of justification so that if they do not convince the judge, he should issue a sentence based on the evidences provided thatthere is noreasonagainst it. On the contrary, the judge considers his personal findings according to the proofs having been rised to convince him; it is a document for issuing a sentence. Since this is a comparative study, the researcher aims to compare two evidences in the courtsof Iranand France. These two item are irrebuttable presumption or conclusive presumptionand judicial circumstantial evidence. This article explains the features of each type of evidence and their convincing power in French and Iranian law. It also compares the role of the two. French law is a German-Roman law. Judicialprocedureis issueddifferentlyin the courtsofthiscountry. Different judges have different opinions in the issuance of a sentence; however, the country's distinction court investigates the differences and issues thefinal vote. Frenchjudgesare obliged toaddressat first the disputesin accordance withthe law; when the law is silence, he should find circumstantial evidences.

In Iranian law, the evidences are based on Islamic law so that it contains all signs ofclaim evidenceincluding both confessionsout of court or in the court. Conclusive presumptions and judicial circumstantial evidences are used by judges in courts. In Iran, all conclusive presumptions will be neutralized against opposite reasons; they are relative and one can claim opposite to them while there are some absolute evidences in French law that one may not be able to claim against them. According to the role of presumptions in the evidences in Iranian and French law, it seems French lawyers refer more than Iranian lawyers do to presumptions for their evidences because satisfying the conscience of judges incourts has been accepted as a necessity. Moreover, the presence of absolute evidences has multiplied its proving power. This obvious difference leads French law to focus more on evidences in the court to prove claims. This study has laid its hypotheses based on this difference. The basic question is what are the main characteristics of evidences and the differences in the rights and principles of Iran and France?

# Research hypotheses

There are some differences between irrebuttable presumption or conclusive presumptionand judicial circumstantial evidence in the law of Iran and Francein terms offeatures. There are some differences between irrebuttable presumption or conclusive presumptionand judicial circumstantial evidence in the law of Iran and France in terms offoundations.

# Foundations of difference between conclusive presumption and judicial circumstantial evidence in Iranian and French Criminal law

IranianandFrenchlegal systemshavedifferentsources. Legalconceptsofthetwo systemshave differentconnotations. Moreover, legal rulesin both countriesalsodiffer from one another. For example, the nature of cause and crime has different meanings due tolawsin both countries and they have separaterequirements in the jurisprudence of the courts.



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Therefore, there are different behaviors in the definition of evidence and the investigation of claims. In the legal texts of IranandFrance, criminalization, execution, and penalty have different manners for prosecution of the accused. In Iranian legal texts, the accused cannot use 'mistake of law' as a defence. It means one cannot commit a crime by ignorance. Nonetheless, in France, criminal law allows removal of criminal responsibility due to 'mistake of law' only in one case; when the claimantwas notabletoavoidit. The systems of conclusive persuasion aredifferentIranandFrancelaws. Iranian legal system had tended to legalarguments. It had emerged to limit the judge's authority and prevent the resort to supernatural reasons. After beinginspired by Sharia lawand Islamic Penal, the spiritual system of reasoning or conscionable persuasion has been replaced. In this system, judge's certainty is the criterion for judgment and utilization of evidences is permitted for achievement of certainty. Ensuring and faithtowardmaterial fulfillmentornon-fulfillment of crime and assigning ittoa criminal, and determininghiscriminal responsibility are mostly under the influence of judge's conscienceandinner feelings rather than previouslegislativedecisions. Conclusive presumption is also valid in French legal system and it has assigned the freeevaluation of evidences. This freedom is regarded theoretically as a necessary supplement for presumption of innocence inofobtainingcriminalevidences and the legislator has emphasized on the judge's decision-making based on inner beliefs. All evidences are relevant in the conclusive system of judgment, each evidences has the same value asotherevidences, and the legislator has predicted no hierarchyamong them. This is a matter of contradiction in judicial procedureinIranandFrance. In Iranian judicial procedure, some available evidences in the case record such as documents and confessions are more important, and other evidences will be considered when they are necessary. In French judicial procedure, all evidences have the same value and the scientific evidences can be used when they are required.

According to Article 166of the Iranian constitution and Article 214of the Criminal Procedure Code, courtjudgmentsshouldbereasonablejustified and documented to the provisions and principles upon which thedecisionhas been issued. It shows that Iranian judicial procedure insist on the conclusive system of judgement. On the contrary, French misdemeanor courts are obliged to justify their sentences and decisions; of course, criminalcourtsare exemptfromanyjustification. Although French judges are obliged to register what has been regarded as the reason for committing a crime, they are free to prove their evaluation of evidences that have convinced them. Thecertain indications and referencessuggest that the foundations of considering evidences to prove a claim in trials and the manner of using evidences in are different in thecriminal law of Iranand France; even, the proceduresarealso different. The second paragraph of Article 427 of the French Code of Criminal Procedure emphasizes on the observance of parties presentation at the court. Therefore, all topics should be discussed by the and the magistrate cannot make a decision according torumors, personalknowledge, evidencethatthepartieshave not beennotified, and a previous subject that has not been re-examined in the session. Iranian procedure has confirmed presumption of innocence based on the attainment of certain courts; on the other hand, it rejects condemnation sentences issued based on the evidences in lower courts that have not provided reasons for convincing the general assembly. In general, only the convincing evidences are allowed for issuance of a sentence for considering one as guilty. However, this principle was adjusted after the Islamic Revolution according to reliance onreligious rules and the presumption of innocence and it insists more on the judge's inner conviction. In general, it can be said the subject of criminal proving for the lawyersinthecountries are based on three legal, material and spiritual factors. The distinguishing factor of criminalcourtsin both countries is the judge's emphasis on each factor in thecriminal courts. If one would like to list the foundations of differences between Iran and France law in terms of evidences, hemay articulate social reality, the history oflegislation, Judicial procedure(based on moralorlegalreasons), legal issues(sources of law in Iranand France), the nature ofproving case, systemof persuasion, nature and origin of the causes, and lawyers' ideaabout proving in criminal cases.

In Iran, judicial circumstantial evidence is regarded as a tool to explore a reality. It is a device to remove the necessity to prove probable issues. In this legal system, judicial circumstantial evidence is not obtained from text and the legal procedure is free to select other signs. The observance of circumstantial evidence is obligatory unless the contrary is proved. On can hardly call causes without contradiction evidence. In contrary, evidence is permittedlawfully as a



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legalpresumption in French procedure and itsscopeis limitedtolegal rulings. The observance of judicial circumstantial evidence is obligatory and itisof generalvalidity. The judge uses circumstantial evidence to persuade himself and refer to them.in this juridical procedure, circumstantial evidences are divided in two groups of simple and irrevocable.

# Characteristics of conclusive presumption and judicial circumstantial evidence in Iranian and French Criminal law

Characteristics of evidence differ in French and Iranian criminal law; moreover, its definition and implication also differ in two countries. Hence, they are employed in different cases according t their characteristics and implications. Perhaps, some evidences are rejected in Iranian procedure, but they are accepted in French procedure to prove a claim. A characteristic of French and Iranian evidences is revealed in terms of its concepts and connotations. Article 1321 of Iranian Civil Code stipulates, "By circumstantial evidence is meant conditions and circumstances which are considered, by virtue of law, or in the view of judge, as proofs of a matter." In French law, evidence or presumption means the perceptionof anunknown matter from a knownevent as it stipulates, "Presumptions are consequences that the law or the magistrate draws from a known fact to an unknown fact. The commoncharacteristics of presumptions in French and Iranian Civil Codes is the fact that conclusive presumptions are assigned by the virtue of magistrate decision and it is employed as much as the judge will be convinced. The difference lays in the utilization of these two legal systems. In Iranian manner, they are employed as subsequent of other reasons, but the French law uses it like otherreasonsand parallel tothem. Since Iran persuasion system is mixed and France persuasion system is free, there are different implications of evidence in their procedures. There is no rating and valuation for reasons and evidences in free persuasion system, but there is a distinction between proof oflegal actsandmaterialfacts in mixed persuasion system. In this regard, the legal system of evidences is emphasized to investigate legal acts and free system of evidences is employed to prove material facts.

In terms of persuasive power, evidences vary. Due to the power, judges will be convinced and issue a sentence. The persuasive power of evidences also differs in different legal systems. Perhaps some evidences arenot valid in Iranian law, but they have so persuasive power in French procedure. In addition, the persuasive power of conclusive presumption and judicial circumstantial evidence vary. Another characteristic of judicial circumstantial evidence in Iranian and French systems refers to the fact that French version has predicted and edified judicial circumstantial evidences in thetexts of the applicable laws, but these provisions have been established in Iran law. As a result, one can say that characteristics of evidence in French and Iranian law vary in terms of both conclusive presumption and judicial circumstantial evidence. The validity of conclusive evidence is relative and personal in Iran; it is evaluated by thesupreme judicialauthority. When there is a contradiction between conclusive and circumstantial evidences, circumstantial evidence is the ruleoflaw. This evidence is constructed of two elements: material and spiritual elements that are validating by the judge. The spiritual element is used for satisfaction of judge's conscience. The scope of using evidences has a wider range and scientific experimental evidences are prominently used incourts. Satisfaction of judge's conscience is not limited to some specific reasons and it continues to persuade him. Criminaljudgehasconsiderableauthorities; he can use the reasons and evidences as much as he will have been convinced. Evidences have material and personal soruces and both aspects are considered in the investigation ofclaims. Explanation of the charge is carried out in French legal procedure with respect to rights, free will, and due process. This procedure considers the principle of innocence. The burden of proving claims is assigned for culprit and the judge pays attention to the principle of ensuring accused's defenserights. Personal freedom in using evidences is extended as much as exploring the reality.



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### CONCLUSION

First hypothesis: There are some differences between irrebuttable presumption or conclusive presumption and judicial circumstantial evidence in the law of Iran and France in terms of characteristics. Considering conclusive presumption in Iran's justice system had been under the influence of positive law, Islamic Penal Code, Sharia lawand Islamic Jurisprudence. After the Islamic Revolution in Iran, judicial approachisbased on moral arguments. Judicialapproachhas beenbased onmoralarguments. Although documents in the caseofclaims pursuanttoattainjudge'scontentment, the validity of evidences is conclusive or relative and personal. Evaluation is also the responsibility of the supreme judicial authority. Since conclusive evidences have two material and spiritual elements, the positive validity of its material element depends on the judge and moral-spiritual value is fulfilled by the contentmentofjudge'sconscience. This practice also exists in France, but it has different usage and implications. A judge can use conclusive evidences as much as necessary in criminal procedure and he can use scientific-technological signs case of anyfailure. The satisfaction system of French judges is not limited to some certain reasons so that it can be continued to satisfy him. This refers to employment of free system of judge's satisfaction. In this type of jurisprudence, evidences have two sources: personal and material, which are considered by criminaljudge. In terms of judicial circumstantial evidence, there are differences in Iranian and French criminal system. Circumstantial evidences are divided into two categories, relative and absolute. Proving the opposite case is relevant in the circumstantial evidence; but it is not relevant in absolute evidence. Positive power is validin allcases and it has reasoning role. However, the burden of proofisupon the claimant. Circumstantial evidences causesa kind of suspicion; if it does not satisfy the judge, it will be imposed on him. The dominance of circumstantial reason over moral evidence has been maintained in thecourtsof Iran. Because classification ofcrimeshas been madeinaccordance withIslamic Penal Code, it results in a different manner from the French in addressing the evidences. French circumstantial evidences support individual and civilliberties. In this regard, the individual rights and free willisrespected in the procedures even in the explanation of the charge. As ensuring a defendant's rights, individual freedom, and flexibility exists in the Frenchjustice system, the process of investigating evidences is observed toprovethe truth. In addition, plaintiffs and defendants have the equal rights inlegalproceedings. Acceptance of criminality evidences is carrying out consistentlyandsystematicallyinthe Frenchcourts so that proving punishment processhas beensystematic, this has not been donein Iran. Of course, the classification of crimes in France differs from that of Iran; this influences the usage of evidences, reasoning, and handlingsystemtoachievecontentment. In this manner, the difference between conclusive presumption and judicial circumstantial evidence is uncovered in the law of Iran and France in terms of characteristics.

### Secondhypothesis

There are some differences between irrebuttable presumption or conclusive presumption and judicial circumstantial evidence in the law of Iran and France in terms of foundations. The general foundations of differences between incriminal lawsof Iranand France can be explored in social reality, the legislative history and judicial procedure, legal resources, and persuasive systems, the nature of proving a case, system of persuasion, nature and origin of the causes, and lawyers' idea about proving in criminal cases. In explaining this hypothesis, the mentioned items have been compared in Iran and France. Social realities in these two countries are not equal. Both Islamic Revolution in Iranand the Great French Revolution have been the source of many important social transformations, so that they have influenced the legislative and legal resources. Iran before the Islamic revolution emphasized mainly on French law and it considered moral arguments and persuasive system. Nevertheless, after the Islamic Revolution, apart from positive positive laws, Sharia law, Islamic Juris prudence and Islamic Penal Code have been included; therefore, they have influenced the nature of evidence to prove the case and reasoning has changed, let alone that evidence is considered low level of reasoning. Justinian law had prevailed in the early France. Classification of evidences, judiciary, and even the process of proving the case had been organized according to the legal requirements of this source. After the Great French Revolution and Constitution based on human rights and civil rights, individual freedoms were emphasized. The



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Constitution Council has considered the development of criminallawprinciples; then, the provisions of the Code of Criminal Procedure were ensured. Social realities should not be disregarded in explaining the differences of evidences in thecriminal lawof IranandFrance. The context of legislation in Iran after the Revolution has ideologicalorientation and it has regarded the principles of Islamic law; this ideology has influenced the classification and classification of offensesand determination of penalties. The context of French law has also influenced by EuropeUnion regulations. It has influenced judicial circumstantial evidence and provisions ofcriminal procedureas well as the process of proving the case. Iranian and French jurisprudence have been continued with some differences. In pre-revolution Iran, spiritual evidences were emphasized and the persuasive system governed the courts. After the Islamic Revolution, legal evidences have been emphasized. However, it is declared that spiritualproofs are under the control ofthecourts. In French legal system, the classification of evidences and related reasons differs from before the revolution. In modern ages, the crimes are classified according to the severity of the offense, which they are crime, misdemeanors, and unlawful. This classification has influenced the definition of evidence, its positive value, and exploring caseevidence. The samethinghas happenedin[slamic Iran: Islamic punishments have been classified as hudud, gisas, and diat and their punishmentshavealreadybeenpredicted. Obviously, it has affected the criminal system and has transformed conclusive presumption and judicial circumstantial evidence. In the jurisprudence of Iran, different types of arguments have not the same value; therefore, the judge's idea about evidences to prove a claim will be depends on moral aspect of evidences. Perhapsthat iswhyit is said, "In the absence of circumstantial evidence, conclusive evidence should be considered." The most prominent example of positive value is found in the comparison of confession and conclusive evidence. However, the French system of reasoning the positive aspects of evidences has equal valuesas others.

Persuasive system in IranandFrance arefacedwith some small differences. In Iran, the judge's satisfaction is mostly fulfilled according to the contents of case file. On the contrary, multiplesigns of evidence are used to fulfill satisfaction in France. Even, they may use scientific documents obtained by modern technologies as much as necessary. This attention to evidence has removed the necessity for a sentence to be investigated by supremejudicialofficials and the possibility of future possiblecancellation. The nature and source of reason is based on the observance of the defendant's rights and making use ofthe legalrequirements and individual freedoms in French legal system, which signifies a proceeding before a judge. In Iranian legal system, which uses inquisition procedures, the situation is different though they claim that they maintain defendants' rights in some cases such as the appointment of public defender. This fundamental difference has influenced the attention to evidences. Lawyers'viewoftheproofin criminal cases is another basic item in the difference between the law of IranandFrance. There are two groups of lawyers in Iran, academic and theological lawyers, who are the origin of thechangesinjurisprudence; of course, these two groups disagree in some cases. Hierarchy ofprovecase, criminal procedure, and utilizing the evidences over time have been affected by this controversy. This controversy has been generated to legal provisions and has been the source for development of new rules. This is clearer in the cases that the court refers to both old and new rules with a harmony. Thisphenomenondoes not existinFrance; positive laws, criminal justice systemandcriminal lawprovisionswere ordained totally and the oral sources were presented to courts after the Great French Revolution. This jurisprudence has been acted consistent and systematic. Therefore, lawyershavea same perspective and they act consistently in the implementation of changes. Its example is seen in the enforcementof Union Councilof Europe in the domestic laws of France. Consequently, the foundations of difference in the evidences in criminal law of Iran and France are revealed.

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### **RESEARCH ARTICLE**

# A Comparative Study of Evidences to Prove Claim in the Criminal Law of Iran and England

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# **ABSTRACT**

This article is based on researches conducted on the subject. Iran and England law are different in terms of legal sources, history and precedent; they differ from each other in the use of evidences in courts, and they are very different in defining and classifying evidences. This article tries to mull over the differences in operation of the legal system of Iran and the United Kingdom in case evidences. The courts try generally to use evidences statutory in the case to occur the lowest error in the discovery of truth and sentencing as well as the highest level of rights fulfillment for litigants. Handling process is very crucial in proving a claim. This process is done differently in the laws of Iran and Britain.

Key words: documents, testimony, swear, confession, evidences, knowledge of the judge.

### INTRODUCTION

Criminal law is the branch of law enforced in the principle of national sovereignty of each country and derived primarily from protected values of the country. Penal systems of countries are usually different because function of criminal law, established for the protection of values, varies in different countries. This difference is the basis for comparative studies in this field. However, many human values are common in most societies; for instance, the right to life, which there is definitely criminal penalty if violated. The legal systems of Iran and England follow this rule; while there are differences in the values and culture, they have much in common in terms of human rights principles. Evidences are varied in criminal law of different judicial systems. The attention of judges and courts as well as the probative value in the legal systems are not the same. This difference creates motivations for comparative studies. Fundamental principles and legal foundation in the legal system of England is common law and criminal statute. Nevertheless, the fundamental principles of Iran legal system are Islamic penal laws, holy religion and



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statutory laws. With these lines, this article are organized to study evidences in the criminal laws of Iran and England. Such studies can pave the way for better understanding of these systems by making these criminal systems closer.

#### **General Overview**

Evidences to prove claim are a set of reasons presented by parties to verify their claims in courts and to convince the court and confirm their claims. According to the essentials for the nature of the judicial cases, the provided reasons vary. What convince the judge's conscience is called reason in law. Although reason refers to things that prove another thing in customs and cultures, reason is complementing the right in law. Nowadays, legal systems look at the role of litigants and the magistrate to deal with the evidences. The legal systems of Iran and England follow this pattern; they exploit evidences as much as necessary in legal provisions in both accusing and inspecting aspects. Article 1258 of Iran Civil Code introduces confession, written documents, testimony, oath and indications as evidences to prove a claim. Naturally, the probative values of these evidences vary. England Family Law Reform Act 1969 agrees about these items as evidences to prove a claim; but it disagrees Iran law on their probative values. Hence, this article compares evidences to prove claims used in Iran and England in terms of priority, probative value, and precedent. In courts, evidences are used to present civil or criminal reasons. This article focuses on criminal laws; thus, the criminal reasons are regarded. The most important willingness to provide criminal and civil reasons relates to the ways in which the reason is cited because legal reason describes affairs referred by litigants (Article 194 of Civil Procedure Code). In describing criminal reason, the indicator has not mentioned, but the concentration is laid on the discovery of truth. In this regard, evidences are called tools to discover a truth even though the ways to refer them differs in criminal and civil courts. In criminal trials, the court should provide evidences. This responsibility may vary in Iran and England. This comparative research mulls over types of reason proving in the criminal law of Iran and England and considers their differences in giving priority to evidences, accountability of litigants, and the amount of attention to the evidences. The main question is 'what are the differences between evidences to prove claims in the criminal law of Iran and England?'

### **Research Hypotheses**

The main hypothesis: there are some differences between evidences to prove claim in Iran and England's criminal law.

### **Subsidiary Hypothesis**

There is difference between the criminal law of Iran and England in terms of judge's knowledge.

There is difference between the criminal law of Iran and England in terms of legal documents.

There is difference between the criminal law of Iran and England in terms of testimony.

There is difference between the criminal law of Iran and England in terms of oath.

There is difference between the criminal law of Iran and England in terms of confession.

There is difference between the criminal law of Iran and England in terms of indications.

### Methodology

The materials and documents of this study have been collected by note taking in libraries. Since this is a comparative study to investigate the evidences in both Iran and England's criminal law, combined method is exploited and the gathered data are compared through descriptive- analytic methods.



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### Relevance and Approach

Relevance and approach are basic issues in comparative studies of evidences to prove a claim. In legal systems, approaches to prove a case are different; the relevance also varies as well. In Imamia jurisprudence, judge issues a sentence by presenting evidences, discovering the truth and acquiring certainty, which have approach aspects. Different types of evidences are relevant in this precedent and judge's knowledge is proof. There is no chapter for reasons and their probative value in criminal law of Iran that express general rule to deal with all crimes. Nevertheless, Islamic Penal Code, in hudud and gisas chapter, explains the reasons and some sentences in the each criminal section. This type of legislation signifies that reasoning system in ta'ziri crimes follows general rules; hence, it is related to approach. However, in hudud, gisas follows legal system of reasoning. Precedent in England allows the relevance of different types of evidences; they can be used by judge to the extent that they are appropriate to persuade the judge for sentencing in the courts. They can even be employed before handling a case in explanation of the charge. In this juridical manner, the methods for addressing evidences in relevant rules are separated; therefore, it is easy for the judge and magistrate to handle the case. In English procedures, writ for evidence gathering is carried out due to the request of the claimant and it can be carried out by court's supervision when the procedure needs specialized process. Moreover, there is a tremendous distinction between civil proceedings and criminal proceedings. This distinction is the base for difference between utilization of evidence in civil and criminal proceedings. Moral blame is usually in criminal conviction. Proving crimes is done in courts of England in two ways, namely: direct providing evidences and utilization of different indications. It is necessary to provide evidence for reasons proving indirectly by indications. The approach for presentation and authentication of an indication in the procedure is very important and it plays a pivotal role.

The approach to handle a case in English courts is subject to special procedures in which jury, witnesses, lawyers and court play their role in identification of reasons, the nature of reasons' supervision, and following the investigation process. The judge is obliged to recall the proposed reasons confirming the identification of accused by eyewitnesses to jury. Respectively, the jury identifies the reasons having been hidden from the judge and presents them to the court. Both jury and judge supervise the utilization of evidences either in terms of relevance or in terms of approach.

# Vidence Match in Iran and England

# The Knowledge of Judge

Judge's knowledge does not mean his mastery of the evidence provisions, but it refers to evidences establishing contentious issue. This knowledge contains two types of information. First, data gathered outside the case such as witnesses, conditions, circumstances and evidences in the case. Through conventional means, judge should try to collect this information. If the data gathering tools are unconventional, they are regarded irrational. In England's procedure, the accused's tendency of committing a crime is verified before simulation of crime scene because this procedure does not allow court to force accused or convicted to do an affair. In Iran, some jurists have limited the scope of adherence to the knowledge of judge and they argue that the knowledge acquired by testimony or confession is valid to the extent of confession and testimony. In criminal matters, the knowledge of judge is the base of judgment and it is considered as a strong and independent proof for case. In other words, the knowledge of judge is the base of both valuation of sentence and issuance of sentence. In England's procedure for crimes of professional criminals, the knowledge of judge has a critical effect. It is agreed that the criminals of organized crimes have employed their cleverness and intelligence; therefore, the crimes cannot be proved by legal evidences. Hence, the assistance of several professionals, certified experts and specialized laboratories can be used to persuade judge.In judicial procedure of Iran, the indications are used first to handle available evidences in a case; the knowledge of judge is subject to available reasons and circumstances of the case. Nevertheless, in English procedure, judge should try to gather information from outside the available documents. Therefore, there is no separation among various



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stages of the proceedings in code of criminal procedure. However, the knowledge of judge is regarded as one reason for proving a claim in both Iran and England's law; but there are some differences in the methods of utilizing them in handling the cases.

### Confession

Article 1259 of Iran Civil Code says, "Confession in acknowledging the right of another person against one's own interest." Iranian procedure accepts oral confession; but if it is proved false, it will be ineffective. Confession should discover truth and having been expressed honestly. Existence of numerous verses in the Holy Quran is introduced as a reason for formulating confession. In Code of Criminal Procedure of England, confession is one of the legal ways to start an investigation. At a trial of misdemeanors, the court chief inquiries explicit confession of accused. According to judgments of the Supreme Court, confessionis in criminal matters is valid only in terms of its explanatory aspect; if it is not help in discovering truth, it will not be determinant. English courts are more sensitive about confessions that are doubtful due to its tools because it may be acquired by intimidation, fear, or even aid and assistance by the competent authorities, which confession will be void in this case. In Iran's courts, confessor has some features that their observance causes rationality. These include maturity, wisdom, intention, freedom, explanation of confession as a formality of crime. Although two types of explicit and implicit confessions are relevant in Iranian courts, England pays attention to only explicit confession, and implicit confession d not relevant. In Iran, the confession of bankrupt and pauper to his property is void. Since confession is generally unknown, it is not effective. Confession about unavailable rights or objects is regarded ineffective; the confessor should have material value and rational profits. In English courts, when there is not enough reason for proving confession, it is regarded void. Competent persons in English procedure are detention officers, prosecutors, prison chief, magistrate, medical examiner, official expert. In Iran, competent persons for eligibility confession are not predicted clearly like England and the names of magistrate, research judge, and interrogator are introduced. Consequently, in the courts of Iran and England, confession is relevant, and the employment tools are different.

### **Testimony**

Islamic jurisprudence has put forth on testimony a one of the reasons of proving a case. Shiite jurists have regarded testimony as a duty and testimony is obligatory. However, when the witness is not invited to testify, he is not obliged to fulfill it. The reason for obligation of testimony is verses and sayings. In the relevant rules of Iran, special conditions are predicted for testifying such as absence of coercion, and court appearances need. In England legal system, witness is regarded as an accused and he has all the rights privileges of accused people. Right to silence, explanation of charge, and ensuring the rights of defense are some privileges. In this procedure, testimony is considered as a right for witness expressed freely and voluntarily. There is no such an authority titled the investigator or prosecutor in England legal system and judicial police is responsible for the powers of investigator and prosecutor. Local police enjoys of also vast powers; it summons persons to court for testimony in court if necessary. In Iran procedure, it is possible to hide the witness's identity in order to support him in case of emergency. Without the permission of the court, England's juridical police are not allowed to control individual's identity including witness; even the judge cannot ask any question about the identity of witness in open sessions of court unless it is required to fill documents. In both legal procedures, honest is necessary; if the witness expresses lies and false asserts, his testimony will be ineffective. It is prosecutable if the testimony contains defamation. There are some differences in Iran and England attention to the rights of the accused and convicted while both agree on legal aid. Preliminary investigations of the accused and witness secretly. England procedure allows the right to have legal aid for the accused and witness. Preliminary investigations are carried out in accusation, oral and public forms. The right to have legal aid is also available for audiences of England law. Police can investigate witnesses individually or collectively.



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#### Oath

Oath is to summon god's witness in an affair to one's benefit and others' loss. Oath ahs a religious source and foundation; it is respected in all religions. It is assumed that believers do not tell lies in honor of Almighty God and Following him. In Imamia law, oath is valid when it is under the name of "Allah" and other his special names. Jurists argue that groups who do not believe in God should swear to a respectful object by them. According to Article 1329 of Iran Civil Code, an oath is to be imposed upon a person whose confession would he binding if he made confession. In Iranian courts, request of oath is proposed by a person whose claim has been denied by another party. Request for oath may rise by complainant or respondent. The method of sear varies in Iran legal procedure according to the case terms and conditions indicated by the judge. In England procedure, the oath is rituals is carried out after the observance of legal customs for both witness and accused the in terms of swear and to exploit it. In oath, the witness is bound to be honest; if the contrary is proved, it will be prosecutable. Before testimony, the witness is bound to take an oath. When the witness has not the testimony conditions, his speech is heard without swearing as an informed person. If witness avoids searing, juridical police or judge has no right to oblige them. Since the supplementary rights of witness are to a high extent similar to Iran law, there is few contradictions. Although oath has a lower validity in terms of positive power to prove a claim, in England procedure, all tries are directed to maintain rights of accused and witness. Article 51 of Law on Public Order and Criminal Justice emphasizes it. In Iran legal procedure, oath cannot be replaced by another issue. In this juridical manner, oath is overwhelming for the case and all opposite claims are void. The witness swears voluntarily in England while he has right to silence. In this regard, oath is employed as indications in the light of preserving accused and witness' rights.

### **Documents**

Documents are considered significant reasons both for claims and for defenses in the courts of Iran and England. Usually, court determines the degree of documents' validity, but the court is obliged to give effect to it when they are proposed by one of the parties. In Iran legal procedure, characteristics of a document are being written, being defensible, and having document authority. In this procedure, documents are accepted in two formal and regular classes. Formal documents should be regulated by official agents who have the authority. In addition, standards and formalities must be considered in the regulation. Such a document is checked by judge when submitted to the court. High executive power is an important privilege of official document. The owner of official document needs no litigation and procedures tolerance to attain his demand. For ordinary documents, the validity is determined after authentication, parties' signature, and obtaining evidence by the court; then, the document is put on agenda, which may result in attaining the parties demand. Formal documents have a particular positive power in England. Even the documents regulated abroad are also notable if they are not containing an anti-social behavior. England procedure assumes that regulation of a formal document is termination of another formal document. Therefore, it is valid and accepted by courts. It has been observed that a document is not reasoning the rejection of its owner, but it is a known reason against its owner. Therefore, the casualty nature of document should be considered. If the nature of document is clear, obvious and unambiguous, it is valid by the end of investigation. The form of document regulation is subject to the place of regulation. Although ordinary documents are not attributable as a defense before the court, maybe the position of trial is not attributable. A document is reasonably valid when it is still a document. This section indicates that document is important evidence in Iran and England procedures. The courts use formal and informal documents pertinent the circumstances of the case.

### **Indications**

Indication means circumstances known as the reason for an action according to law or for the judge. The circumstances are conditions, status, and ground paving the way for action. Indications are very different in Iran and England law in terms of classification and in terms of positive value; the methods of utilization are also different in



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the courts.in general, rights in common law are classified beyond the reasons and judge uses them to persuade himself in the utilization of their positive power.In Iran procedure, indications are divided in two groups of circumstantial evidence and legal evidence. Legal evidence is a proposed reason according to the text of law; when legal indication support a person's claim it is reasonable and can be considered in a court. On the other hand, circumstantial evidence is circumstances indications proving a case for judge. The judge can uses them as much as possible to be persuaded.In England juridical system, there are differences among indications and other reasons in terms of positive power. In this case, indication refers to numerous evidences and and signs proving a crime indirectly. In this procedure, the reasons are regarded as proof of subjects, which may be rejected. In England, reason does not necessarily mean validity and indication does not mean lack of validity. England's classification differs from Iran's classification. Indications are divided in two groups of subjective or objectivity. It is also divided in basis and non-basis classes. The former one requires a set of preliminary events and the evidence is not rational as much as the indicaton is proved. The latter are items do not require proving of preliminary events; these type of indications are divided as presumption of innocence and health presumption. In health evidence, the court assumes that the offender commits the crime intentionally at a healthy condition.

Another classification of indications in England refers to temporary and definitive aspects. In temporal evidences, termination is possible, but there is no way to assume opposite cases. Therefore, England law is very complex in the classification of indications. They are considered by judges at the courts according to its existence state and the power or weakness. If multiple indications have been established for judge, he issues the sentence. In Iran procedure, legal indications are regarded as two classes of relative and absolute. Legal evidences are more valid than circumstantial evidences. Legal evidence is binding until there is no opposite reason. The principle on innocence equals to presumption of innocence in England's procedure. In addition, health indication is also included in Iran procedures. Hence, there are differences in terms of definition, classification, and positive power between Iran and England. These evidences are also used in different manners by parties.

### CONCLUSION

The laws of Iran and England have substantive, historical and academic differences. Despite changes after the Renaissance, the influence of monarchy on England's law is obvious. Iran's law is based on Islamic jurisprudence, rules of sharia, and Europe law (France). Figh rules have significant effect on Iran procedure. Obviously, these two systems follow different patterns in investigation and dealing with evidences to prove a claim. While both legal systems allow different types of evidences such as the knowledge of judge, confession, document, oath, and indications, but they differs in method of utilization, giving priority to the evidences, positive power, and their classification. In the official investigation into a case, documents have high degrees of validity in both legal systems. Document, either formal or informal, regulated within the country or abroad, is valid for courts if they have had documentation conditions. Juridical police of England is responsible for identifying the observance of regulation requirements; it is carried out by judge in Iran. A document is used for reasoning till it has value and validity, and it is evaluated in favor of its owner. Testimony has used with little difference in the juridical courts of Iran and England. In the procedure of England, testimony is regarded as a right for witness and accused and it is presented intentionally and freely with individual freedom. Of course, honesty in sayings has been emphasized; if the contrary is proved, it will be prosecutable. In the procedure of Iran, testimony has religious foundations, is considered as a duty, and it is collective duty. In the law of England, witness is regarded as accused and he has all rights and privileges of the accused. In Iran, both oral and written testimony is accepted; in England, oral testimony is obtained using technology and in specialized cases. Oath is one of the accepted reasons in the courts of England and Iran. In Iran, oath has religious foundations, but it has individual rights' bases in England. The person who swears is obliged to tell the truth in both legal systems. No one can force san individual to swear. In Iran, the request of oath is proposed by the person whose claim has been denied and it has different ways. In England, both the accused and witness have some privileges and they can use them by the decision of competent court.



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Confession is another evidence to prove a claim in the courts of Iran and England. Confession has foundations in Quran and sayings in Imamia figh. In England, it results from individual rights. Iranian confessor should have maturity, wisdom, intention, and free will. Legal age, authorization, and explanation of the charge are features of confession in England. Investigating judge, magistrate, the interrogator and prosecutor is responsible for dealing with obtaining the contents of confession in Iran. It is the duty of detention officer, warden, the coroner's office, official experts, the interrogator and prosecutor in England. The main difference of confession in Iran and England relates to the fact that Iranian courts accept explicit and implicit confession, but English courts accept only explicit confession. However, written and oral confessions are accepted in both countries. The value of confession is assessed in England by jury. In Iran, it is carried out by judge. Indications are important in he courts of Iran and England; but they have different definitions, classifications, positive power, and characteristics as well as different utilization methods. In Iran, indications are divided in two groups of circumstantial evidence and legal evidence. This legal system evaluates legal evidences at first; then, it may use circumstantial evidences to persuade the judge if required and necessary to fit the circumstances of a case. In English law, indications are divided separately in terms of relevant and civil rights. In this manner, indication is equal to other evidences. They are placed at the classes of common law evidences or scientific evidences. There are also other classifications titled as detectable and non-detectable legal indications. Multiple indications are used in investigation into cases. Validity and attention to indications are wider in the courts of England in comparison with Iranian courts. The knowledge of judge is considered in Iranian and English juridical courts; judge's persuation is very important for sentencing. The knowledge of judge is considered in two ways in courts. First, the acquired knowledge by study of lawsuits' content and provisions; second, data and implications established outside the case files. The judge is committed legally and morally to take the advantages of both types of knowledge to be persuaded in sentencing. However, the approaches to obtain this information should be conventional, legal and ethical. In the procedure of England, the data obtained from unconventional approaches lacks reasoning requirements; jury is responsible for recognizing the reasoning validity of judge's knowledge. Approaches like simulation of crime scene, testimony, confession and other valid approaches are used to persuade judge in Iran. With these lines, dealing with evidences to prove a claim has some similarities and differences in legal systems of Iran and England. The substantive difference in the laws of Iran and England as well as legal-base differences results in differences in dealing with evidences to prove a claim.

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### **RESEARCH ARTICLE**

# Investigation and Comparison of Visual Elements in Websites of Top Universities

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# **ABSTRACT**

The present study assessed the visual elements used to design websites of top universities for better interaction of audience (students, staff, and instructors) with those websites. The progress starts when the user interacts with the university. This research also helps professionals and web designers to design high quality websites. Although visual elements involve all visual elements, web design is not necessarily beautification of display elements. Web design is to present content based on requirements of the user, considering hardware and software limitations, optimally in a good information flow. This is how the main message of a university is transferred to its audience by means of the website. Now, there are weaknesses and deficiencies in the visual elements used in websites of top universities. Therefore, the user can less interact with them. Many of these sites are graphically designed without the knowledge of encoding; the reverse is true. Weak design is felt when engineers design a website without working with web designers. If designers and programmers do not work together, designs of designers will not be encoded and codes of engineering will not aesthetic; as a result, the audience will not interact with the website, except for essential requirements. This lack of interaction is a weakness of academic websites. Using an analytic-descriptive method and field studies, this paper evaluates the visual elements used to design the websites of top universities and explains their advantages and disadvantages to improve design of websites.

**Key words:** Aesthetics, web design, websites, top universities



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# INTRODUCTION

The emergence of World Wide Web resulted in a phenomenon called Website. Web sites connect users to electronic information. Organizations try to fit in this virtual world by using this new phenomenon. The worldwide web has emerged years ago, containing more than one billion public webpage and three million servers (Soheili, 2006). Comparison of national and international academic status of universities is made as ranking of universities; the improvement of their scientific quality has been an integral part of higher education management in all ages. The identification of precise measures is the fundamental precondition for achieving the desired quality of educational system. Thus, the beautiful design of a website interacts with the user and makes him refer to the website in order to meet his needs. Of course, the interaction of user and the university plays a significant role in promoting its various levels. The present study evaluates the visual elements used to design academic websites in order to address the main features considered in these websites. Using a descriptive-analytical method, and library and field studies, this paper reviews and assesses the texts and global events on websites and written resources as well as their results to which web designers and web engineers should pay attention.

### Theoretical Background

To rank and evaluate universities, numerous studies have been used from different approaches, the most important of which include Shanghai (ARWU), Times (THE Ranking) and Webometric (Webometrics Ranking) in Spain. In addition, the theoretical research done at national and international levels are as follows. Ilkhani (2000) evaluated efficiency of the information published on the home pages of 10 research centers in Tehran. The results indicate that options such as table of contents, customer services, updated information, compliance with copyright in text, audio, images and graphics were provided by 0-30% and general options such as organizational logo, history, goals, organizational charts, communication with authorities and publications list were provided by 60-100%. The integrity of the home pages was not confirmed. Asghari-Poodeh (2001) evaluated the elements and web design for academic libraries of 4 top universities in America, Canada, England, Australia and 5 Iranian universities. Presenting a theoretical model for design of academic websites, foreign websites were 78% consistent with the evaluation inventory, while domestic websites were 45% consistent. Behzadi (2001) evaluated graphic design of academic websites using the resources available on the Internet, user operating rules, user interface design, internal component design and Internet technology. The results of this study suggest the presence of a graphic designer relatively familiar with print media, beside a group of computer programmers to improve the appearance of web pages.Onancha and Ochalla (2007) conducted a co-link analysis of 95 higher education institutions in South and the East Africa. The results showed that most South African countries had the largest number of co-links and internal links; they also found strong relationships between web addresses of organizations existing in a country. Older organizations as well as in South Africa, most universities in higher academic status have received more links. Payne and Thelwall (2008) exploratory analyzed links of Nigerian universities using AltaVista search engine. They showed a good relationship between academic websites. Vaughan (2004) reviewed hyperlinks of IT companies in China and the United States. The counted links to the website of a company showed a significant correlation with the revenue and profit of that company. Although there are differences between the two groups of websites, the correlation coefficient of the two countries were remarkably similar. Due to the acceptance of new information and communication technologies, particularly in relation to Internet and the Web, most studies focused on websites of academic libraries as one of the elements of scientific relationship. The discussed studies are less practical, while the present project is practical and extended.

# **HYPOTHESIS**

The visual elements used to design academic websites are different.



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### **METHODOLOGY**

This field study was conducted by a descriptive and analytical method. Reviewing and assessing the texts and global events on websites and literature, data was gathered by searching theses, news reports and publications. The studied group included websites of Harvard Engineering School, Harvard Medical School (Massachusetts, America), Harvard Arts University (Massachusetts, America), Princeton University (New Jersey State of America), Yale University (Connecticut State of America), University of Oxford, University of Cambridge and McGill University.

### **RESULTS**

Due to the increasing public interest in higher education and growing number of higher education institutions cause intense competition between universities and higher education institutions for students and resources. This in turn leads to the formation of different systems of evaluation and ranking of universities and higher education institutions at the international level to compare the specified position of universities, for students and other users make decisions with greater confidence.

### Advantages and Disadvantages of Academic Website

The advantages and disadvantages by means of which the websites become the most valuable sites are examined. In addition, the disadvantages are evaluated to modify these websites. Criteria for evaluation of graphic design and ranking were extracted from the international sites:

Shanghai (Academic Ranking of World Universities ARWU)
Times (Times Higher Education THE)
Webometric (Ranking of World Universities)
To evaluate, some factors were considered, such as:
Content
Navigation
Visual Design
Function
Interactivity
Overall Experience

Above factors are used for evaluation of the website from all directions; however, only criteria associated with appearance of the website were taken into consideration, because the purpose of this study was an aesthetic evaluation of websites.

# Content:

Content is the provided information on a website. Content not only includes text, but also image, audio, animation, or video and anything which communicates with the audience through the website. Good content should be attractive to the relevant audience. Good content, whether scientific or entertaining, always makes the use more enthusiastic.



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### Navigation:

Navigation refers to framework of a website, organization and prioritization of information and direction of the audience through the website. A properly organized website should be integrated, understandable and transparent. This allows an appropriate mental model to find the information presented easily and the audience knows what to expect by each click. Proper direction allows the reader to quickly access the content in any part of the website.

### Visual Design:

The visual design is the appearance of the website. Good visual design well presents it message to the audience.

### Function:

Function of a website means using technology for quick load, active links; any new technology which is used needs to be practical and relevant to the target audience. Website should not be dependent on any browser or operating system. A good functional website considers needs of users from other files, the file format and downloads.

### Interactivity:

Interaction with the audience is the way by which a website allows the user to navigate. Appropriate interaction allows the user to have a mutual relationship with the website. Input and output, such as inquiries, chat rooms, ecommerce and games, forums and instant feedback involve these interactions. A good interactive website allows the user to have a good feeling of interaction. In general, interactive criteria of websites distinguish it from other media such as newspapers and television.

### **Overall Experience**

The overall experience of a website is beyond the content, navigation, design, function and interactivity. This experience often encompasses intangible factors which cause the user to revisit the website or hold the user longer in the website, such as newsletters, send to friends, print etc. The present study considered criteria to evaluate and rank the graphic design of academic websites.

### These criteria include:

Structure
Header
Contrast texts, fonts and colors
Prioritized selection of links and buttons
Footer

### Availability of contents

Table 1 presents evaluation of the world's top universities. Webometric is one of the most authoritative website for evaluation of academic websites. Aesthetically, several examples of these academic websites are evaluated, as follows. Harvard School of Engineering (Massachusetts, America) The Magazine US News & World Report annually lists America's top universities in different categories and disciplines. Harvard School of Engineering, Massachusetts, has been the top university in this list.



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#### Advantages:

The logo in the correct and logical place
Organizational colors for identity
Quick access to subsets at the home page
Sharp and strong levels for better understanding of engineering and industrial space
Colored text
Classified content
The map and address of the website in the footer
Social network links on the footer
Two types of fonts
Full-screen slideshow

#### Disadvantages:

Failure to abide by the contrast in size of categories, while it is compensated by color. Harvard Medical School (Massachusetts, America) Harvard Medical School is a private university in Cambridge, Massachusetts in the United States of America. Some parts of Harvard University such as School of Medicine and the School of Business are at the nearby town of Cambridge, Boston. Harvard was founded in 1636 by the Board of Legislators, Massachusetts Bay Colony. The University is the first institution of higher education in America and the first in North America.

#### Advantages:

Logo in a right place in the header
Organizational color and visual identity of the logo across the entire website (Dark red and gray tonality)
Full slideshow optimized by images and texts associated with the university
Separated parts without using lines, only by putting texts under each other
Images alongside news for better understanding
Size contrast for texts
The main part separated from useful links by contrast gray color on the right

#### Disadvantages:

Excessive images unequal in size and format Harvard Art School (Massachusetts, America)

#### Advantages:

A very short length of the header and the logo equal to the main menu in length

A large calendar alongside the slideshow (Calendar and history are very essential for important artistic events)

Lack of boundaries between wallpaper and the header

Red, black and gray as the most powerful colors for web design; improper use is not correct.

Text and image together in the slideshow

The transparent color spaces for content and useful links

Fade logo in the background



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#### Disadvantages:

Lack of icons and bolts associated with content used on the website

Princeton University (New Jersey State of America) Princeton University is the fourth oldest university in America. Princeton can be known as a home of great physicians such as Albert Einstein.

#### Advantages:

A good color for logo and visual identity of the university Entries presented in one glance and no need to navigate up and down

#### Disadvantages:

The main five-column structure of the website which confuses the user by a large volume of material

An image beside the logo, which makes the image in priority

A small space provided by the slide show for large volumes of content

Three videos under the slideshow, which both damage the slideshow and make the website heavy to load

No color is prioritized

Lack of a base color beside two grayish colors, gray and orange

Unseparated footer or the final section

Important content integrated to links

Yale University (Connecticut State of America)

Yale University is one of the oldest universities in America and the world. Yale University is a private university founded in New Haven in 1701. Many of America's presidents and heads of the state have been graduated from this university.

#### Advantages:

Simple structure

Simplicity of expression and classified materials

The best while simple layout due to the political nature of the university

The beautiful blue color of which top brands and websites around the world have taken advantage

#### Disadvantages:

No Logo

Unclear title

Lack of access to essential links

Failure to comply priority of texts

Given the political nature of the university, most non-compliances such as over-simplicity may be intentional.

#### **Oxford University**

Oxford University located in Oxford Shire, England, is the oldest university in the English-speaking world. Since 1096, the teaching process has been happening at Oxford. Oxford is the oldest university in the English-speaking world and the second oldest university in the world, following University of Bologna.



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#### Advantages:

Proper place of logo in the header

Magnet menus which are fixed as the user navigates up and down

Three sections and three scrolls containing news, discoveries and students

Contrast in color and text size

Colored social links on the footer

Organizational color and visual identity of the university

Events separated from news

Full slideshow, beautiful photos of students and campus with texts on the slideshow

Changing color of the links

Website design is fully interactive and compliant with standards.

Cambridge University

University of Cambridge is located in Cambridge, Great Britain, at the edge of River Cam. The university, founded in 1209, is the second oldest university in the English-speaking world and the third oldest university in the world.

#### Advantages:

The logo on the left side of the site

Menus on the right side and an open space in the middle of the header

Two of the three parts of the slide show assigned to photographs and the rest assigned to texts of the slideshow

The texts classified into different sectors and prioritized

The news section classified into headlines, news of the past etc.

A box and coherence of images

Colored texts using the contrast text

A single font

A complementary color for logo

Three-column structure of the website and four-column footer separated from the main body

#### Disadvantages:

Lack of warm colors beside cool color Excessive footer and lack of material for the footer McGill University

McGill University founded in 1821 in Montreal, Quebec, Canada, is the highest ranked among Canada's universities. With more than 200 thousand graduates and professors around the world, McGill is one of the best-known universities in various fields of sciences.

#### Advantages:

A rectangular box in the header for logo

Quick links in the header distinguished by red color

Enriched; previous and next pictures are faded in black and white

A transparent table on the slideshow with white text on it

Menus under the slideshow

The divided site into three main parts

The contents presented in special tables to visit the next page



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Events and news next to a calendar
A PgUp button at the bottom
Footer different from the wallpaper, which connects up and down
Social links on the footer
Important materials on the home page and a more button to see more content
The disadvantages can only be the improper use of icons.

#### **DISCUSSION AND CONCLUSION**

The present study presents an overall picture of visibility, academic files, the website size, traffic rank and design of academic websites. Information, message and mission of a university are transferred to the user via the web pages; therefore, universities are responsible to design user-friendly websites, because the interaction of audience with websites and participation in surveys can overcome deficiencies existing in websites. Evaluating the structure of the world's top academic websites and reviewing their advantages and disadvantages, this study concluded that academic websites are different in structure and content. For example, the websites of Harvard Engineering and Applied Sciences, Medicine, and Arts and Sciences were designed completely independent, each transferring the concept and expression of the website to the user. For example, the structure of Harvard Engineering and Applied Sciences website was highly ordered and geometric without any circular and curved lines; the colors were industrial and the writing was especially regular expressing the industrial concept. The same was true for the structure of Harvard Medicine website which was perfectly designed medically; images, structure and contents all denoted a medical website. Colors, writings and typography were all coordinated. The website of Harvard Arts and Sciences was completely artistic without any restrictions on used elements representing the creativity. Therefore, it was concluded that academic websites are designed differently.

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Table 1: Evaluation of universities. Webometric website

Rank	University	Country
1	Howard University	America
2	Oxford University	Great Britain
3	Cambridge University	Great Britain
4	Yale University	America
5	Imperial London College	Great Britain
6	Princeton University	America
7	Caltech (California Institute of Technology)	America
8	Chicago University	America
9	London University	Great Britain
10	MIT(Massachusetts Institute of Technology)	America
11	Columbia University	America
12	McGill University	Canada
13	Duke University	America
14	Pennsylvania University	America
15	John Hopkins University	America
16	Australian National University	Australian
17	Tokyo University	Japan
18	Hong Kong University	Hong Kong
19	Stanford University	America
20	Cornell University	America



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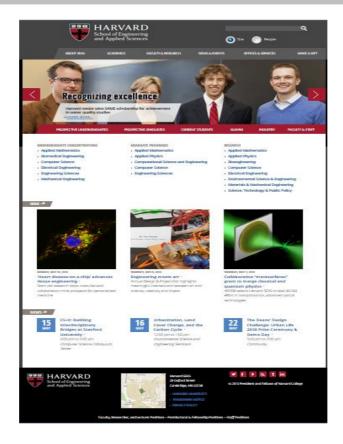


Figure 1: Home page of Harvard Engineering University, source: (www.seas.harvard.edu)

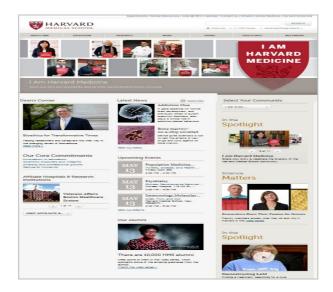


Figure 2: Home page of Harvard Medical University; source: (http://hms.harvard.edu)



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Figure 3: Home page of Harvard Arts University; source: (http://arts.harvard.edu)



Figure 4: Home page of Princeton University; source: (http://www.princeton.edu)



Figure 5: Home page of Yale University; source: (http://www.yale.edu)



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Figure 6: Home page of University of Oxford, sources: (http://www.ox.ac.uk)



Figure 7: Home page of Cambridge University, sources: (http://www.cam.ac.uk)



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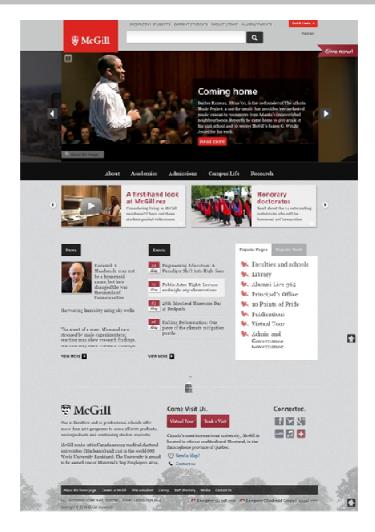


Figure 8: Home page of McGill University website; source: https://www.alumni.mcgill.ca



#### RESEARCH ARTICLE

# Comparison of Visual Elements Used to Design Iranian Academic Websites

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## **ABSTRACT**

The present study assessed the visual elements used to design academic websites. This research also helps professionals and web designers to design high quality websites. Although visual elements include all visual elements, web design is not necessarily beautification of display elements. Now, there are weaknesses and deficiencies in the visual elements of academic websites. Therefore, the user can less interact with them. Many of these websites are graphically designed without the knowledge of coding; the reverse is also true. A weak design is felt when engineers design a website without working with web designers. If designers and programmers do not work together, designs of designers will not be coded and codes of engineering will not be aesthetic; as a result, the audience will not interact with the website, except for essential requirements. This lack of interaction is a weakness of academic websites. Using an analytic-descriptive method and field studies, this paper evaluates the visual elements of academic websites and explains their advantages and disadvantages to improve design of websites.

Key words: Visual elements, web design, Iranian academic websites

# INTRODUCTION

The present study evaluates the visual elements used to design academic websites in order to address the main features considered in these websites. Using a descriptive-analytical method, and library and field studies, this paper reviews and assesses the texts and global events on websites and written resources as well as their results to which web designers and web engineers should pay attention. The demand to store, organize and retrieve information has



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increased significantly by emergence of Internet and Web. Web sites as important means of information transfer are of particular interest for education and research. Since 1990s, the number of webpages indexed by search engines has reached several billions. Regular review and evaluation of structural and content aspects of websites followed by their strengths and weaknesses provide a suitable approach for policy and decision-making. By increasing growth of educational and research websites and their importance in introduction of centers, as well as presentation of research findings, it is essential to evaluate websites for their credit, applicability, and navigation (Sung-Eon et al., 2003). This evaluation results in ranking of the academic websites and calculation of the extent of their presence on the Web and scientific presentations as an indicator of the performance of universities and research institutes. Because research activities are conducted on the Internet and the Web with access to the findings, websites are of great importance as input of universities reflecting educational and research activities.

#### Theoretical background

To rank and evaluate universities, numerous studies have been conducted from different approaches, the most important of which include Shanghai (ARWU), Times (THE Ranking) and Webometric (Webometrics Ranking) in Spain. In addition, the theoretical research done at national and international levels are as follows. Ferodi (2001) evaluated 13 websites of academic libraries in Iran based on the scientific network index of Iran. The studied group included Islamic Azad University of South Branch, Alzahra University, Tarbiat Modarres University, Tehran University, Amirkabir University of Technology, Sharif University of Technology, Iran University of Science and Technology, Bu Ali Sina University, Tabriz University, Shiraz University, Ferdowsi University, Shahid Beheshti University of Medical Sciences, and Kermanshah University. Using an inventory in the form of three separate tables, this study evaluated the criteria related to content of homepage, search and facilities for users. Findings showed a 40.8% compliance with the criteria. Tillotson (2002) studied undergraduate students by evaluating webpages. He measured perception of students on the need to evaluate webpages and their ability to state criteria for evaluation. To conduct the research in two Canadian universities, questionnaires were distributed among the participants in the training book reading courses. The results showed that students looked somewhat critical to web resources and they were aware of standard criteria for evaluating websites. Raward (2001) claimed that the design would be successful when user-oriented design was used in development and completion of webpages for academic libraries. According to Raward, two factors need to be considered in web design of academic libraries, number of users and the information requirements in the academic environment. Although it is important to measure the users' needs, this study reported that users are less involved in web designs. Due to the acceptance of new information and communication technologies, particularly in relation to Internet and the Web, most studies focused on websites of academic libraries as one of the elements of scientific relationship. The discussed studies are less practical, while the present project is practical and extended.

Agrin and Nwagwu (2006) used AltaVista search engine to conduct a heuristic analysis of the links to academic websites of Nigeria. They showed a relationship between the links to academic websites. Mateos et al (2001) presented a profile consisting of four major categories including content, speed, availability, and surfing to provide a new assessment profile and analysis of universities in Spain. This study showed a flexibility between this web assessment profile which determined the strengths and weaknesses of the websites. Beekink (2000) also reported a positive effect of training on how to use the World Wide Web and how to use subject directories instead of search engines on negative attitude of people. Considering the growing number of websites on the national and international level, it is essential to evaluate the presence of Iran, particularly Iranian academic websites, in the web.



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#### Hypothesis:

The visual elements used to design Iranian academic websites are different.

#### Methodology

This field study was conducted by a descriptive and analytical method. Reviewing and assessing the texts and global events on websites and literature, data was gathered by searching theses, news reports and publications. The studied group included websites of Sharif University of Technology, Amirkabir University of Technology, Tehran University, Tarbiat Modarres University, Shahid Beheshti University and Alzahra University.

#### **RESULTS**

The elements considered for evaluation included:

Content

Navigation

Visual Design

Function

Interactivity

Overall Experience

Above factors are used for evaluation of the website from all directions; however, only criteria associated with appearance of the website were taken into consideration, because the purpose of this study was an aesthetic evaluation of websites.

#### Content:

Content is the provided information on a website. Content not only includes text, but also image, audio, animation, or video and anything which communicates with the audience through the website. Good content should be attractive to the relevant audience. Good content, whether scientific or entertaining, always makes the use more enthusiastic.

#### Navigation:

Navigation refers to framework of a website, organization and prioritization of information and direction of the audience through the website. A properly organized website should be integrated, understandable and transparent. This allows an appropriate mental model to find the information presented easily and the audience knows what to expect by each click. Proper direction allows the reader to quickly access the content in any part of the website.

#### Visual Design:

The visual design is the appearance of the website. Good visual design well presents it message to the audience.



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#### Function:

Function of a website means using technology for quick load, active links; any new technology which is used needs to be practical and relevant to the target audience. Website should not be dependent on any browser or operating system. A good functional website considers needs of users from other files, the file format and downloads.

#### Interactivity:

Interaction with the audience is the way by which a website allows the user to navigate. Appropriate interaction allows the user to have a mutual relationship with the website. Input and output, such as inquiries, chat rooms, ecommerce and games, forums and instant feedback involve these interactions. A good interactive website allows the user to have a good feeling of interaction. In general, interactive criteria of websites distinguish it from other media such as newspapers and television.

#### **Overall Experience**

The overall experience of a website is beyond the content, navigation, design, function and interactivity. This experience often encompasses intangible factors which cause the user to revisit the website or hold the user longer in the website, such as newsletters, send to friends, print etc.

#### Sharif University of Technology:

#### Advantages:

The overall structure and content of this website is based on a simplicity; in general, academic websites need to be simple, so that the user does not confuse. The website does not need to scroll down; the content is visible at first glance. The logo is used as bullet next to the main topics. Lines are used instead to boxes; this makes the website easier to load. There is a scroll next to the link to upcoming events; it occupies smaller place and does not mislead the user to find the content.

#### Disadvantages:

Although the important sections on the upper right are separated, they are prioritized.

Although the header is attractive, the title is very simple.

There are five images next to each other in the slideshow. It could be better to use smaller images with larger reference image. Moreover, the images are not prioritized.

Although there is no contrast between texts and fonts, the texts are presented in two colors, which is attractive.

#### Amirkabir University of Technology (AUT):

According to Webometric, AUT is the second top university.

#### Advantages:

The header is attractive; the logo is in a good place. The typography and layout are also attractive. The header is beautifully behind the slideshow. The slideshow is very typical; its content is at the bottom on a black strip. Highlights section is next to the slideshow in a dropdown style. There are images next to the highlights; however, this



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is not appropriate to use images next to a dynamic slideshow. The red line news menu allows the user to separate it from other sections. It is a good idea to present a page of the weeklies, because less images are used and the link at the bottom of the site attracts the user's attention. The used colors are cool and industrial. Generally, the blue color is dominant in all academic websites around the world.

#### Disadvantages:

Separators are excessively used over the entire sections and links. Their repetition causes uniformity throughout the webpage. Lack of bullets makes the website very simple and typical. There is a search icon at the bottom. It is better to place the icon at the top, so that the user can find the icon easier. Images are improperly used in the slideshow. According to the web design criteria presented in 2013, slideshows are currently designed stronger. Although the website is simple, the slideshow is disorderly without any graphic layout for texts. The contact us section is designed weakly; the user needs to scroll to the footer. Even the link is not in a right place in the footer. Icons are not selected correctly in the electronic services section. In general, the website is simply designed without any particular aesthetic criteria to attract attention.

#### **Tehran University:**

Tehran University is the first top university of general sciences for different periods of history in Iran.

#### Advantages:

The website is designed better than the previous websites. The structure is designed properly by careful selection of colors (red and blue). The events section is next to the slideshow and presents the major events and important topics in a dropdown style. It occupies a small space and it can be scrolled up and down by the mouse cursor. Moving the curser on the menus changes the color, causing user interaction. Professional photography is used for the slideshows.

## Disadvantages:

Although there are four categories of subjects at the bottom of the site, they are not prioritized. For example, user login which is one of the most important links is in the same priority as other links. The slideshow and highlights sections are designed in an old fashion. The website lacks icons. According to the web design parameters presented in 2013, icons are currently used more than previous, because they add to the attractiveness and make it easier and faster to access to the sections. Although Tehran University has been better than the other universities, it still needs more improvements. Tarbiat Modarres University (TMU)TMU is the second top university of general sciences in Iran. In addition, TMU has been successful in web design.

#### Advantages:

The general structure and the footer are designed by a successful graphic.

The logo is creatively placed on the right side.

The green color which is a symbol of education is used.

The title is at the top center to draw attention of the audience.

A narrow menu of images is used to display the content as a whole.

The three photos on the right side well present an overall picture of the university.

There is a good slogan under the header which attracts the attention.

Search link is in the best place which does not mislead the user.

The links are prioritized; sections containing special news and a special image are separated at the top by green color.



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In the news, electronic services and events sections, groups are prioritized by color, font and links.

There is spacing between lines and texts in different boxes.

In the news section, date and time are separated from descriptions section by proper use of color changing. A faint line is the boundary between them. In the electronic services, the lines are prioritized by reducing the distance between them; their colors change by clicking on them. In the structure, as a whole, color and form are properly integrated.

#### Disadvantages:

Triangular forms in the main menu damage the structure, because these forms called as tab pages are reverse. Finally, they are not repeated anywhere in the site. Shahid Beheshti University Shahid Beheshti University is the fifth top university of general sciences in Iran.

#### Advantages:

The structure is designed professionally.

The beautiful header, including background clouds matched with the raised flags and the broken calligraphy, beautiful and different logo, all together add to the attractiveness of the site.

The sections are classified in terms of relevance of links.

The news section is separated to find the content easily.

The stair menu helps the user interaction.

A new typography is used for slideshow; however, it is better to be more careful in arrangement of slideshows. They seem crowded because of excessive use of images.

The website is presented in the screen page as a whole without scrolling. The use does not need to navigate up and down.

Buttons are accessed quickly.

The links are at the bottom; however, it is better to use a structure and a grid.

#### Disadvantages:

Lack of bullets and graphical elements such as icons leads to weaknesses in the graphics of the website.

To compensate the effect of cool colors, a narrow strip or a link or button of warm colors is required.

Although sections are separated by tables, the overuse is confusing. It is better to use separators.

Alzahra University, Tehran

#### Disadvantages:

Header of the web page is composed of four unrelated images (graphical elements are poorly designed).

The logo and the title of the university are on the left side and not in line.(fig-6)

The menus are not prioritized and they do not support a special graphics. Sharp shadows have been long outdated.(fig-7)

Menus lack aesthetic elements and they are very long. The weak news section covering the slideshow separates the website into two parts. High quality, attractive images are the most important element in slideshows.(fig-8)

The news title is separated from the image by an unreasonable shadow.(fig-9)

The improper place of date and time leads to incorrect presentation.

Scrolling news is not appropriate in the middle of the page.

No graphics is used on the links below the slideshow. They are simply separated by green boxes.(fig-10)

For IT section, irrelevant icons are used.(fig-11)



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No regular writing is used for the footer; the words are just types(fig-12)

The map should be in the footer or the contact us section; here, it is wrongly in the main structure. (fig-13)

The search button is at the bottom; there is no guide for new students.

Language, site map and contact us icons are not in the right place. The color used for them is not attractive.

One of the most important and widely used buttons and links is user login, which is located here in the education section. The main structure is curved with too many shadows.

#### Advantages:

IT links which is the most used buttons are separate from other sections. There is a space for advertising; however, it is better to put advertisements in news section.

#### **DISCUSSION AND CONCLUSION**

The current study presents an overall picture of visibility, academic files, the website size, traffic rank and design in web site of Alzahra University. This is consistent with previous results of Asghari-Poode (2001), noting that Iranian academic websites are relatively weaker than other academic websites in a global scale. This is also consistent with Khaleghi and Davarpanah (2004) on weakly updated websites. Information, message and mission of a university are transferred to the user via its web page; therefore, universities are responsible to design user-friendly websites, because the interaction of audience with websites and participation in surveys can overcome deficiencies existing in websites. Evaluating the structure of the top academic websites of Iran and reviewing their advantages and disadvantages, this study concluded that Iranian academic websites of technology, general sciences and arts universities are designed differently in structure and content. The purpose of present study was to investigate the graphics of Iranian academic websites and their advantages and disadvantages in order to overcome deficiencies. Thus, several solutions are recommended to improve Iranian academic websites:To found centers of academic assessment for better evaluation of academic websites based on the methods and practices used worldwideTo form a special team of web design in universities to change the graphic and update the contentTo teach students with theoretical and practical topics of web design graphicsTo form groups for surveys and consultation for promotion of scientific and academic websites, particularly their graphics

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Figure 9: Home page of Sharif University, source: (http://www.sharif.ir/com)





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Figure 10: Home page of AUT, source: (aut.ac.ir www.)



Figure 11: Home page of Tehran University, source:( http://www.ut.ac.ir)





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Figure 12: Home page of Tarbiat Modarres University; source:(http://www.modares.ac.ir)



Figure 13: Homepage of Shahid Beheshti University, source:(http://www.sbu.ac.ir)





Figure-8



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Figure-9



Figure-10



Figure-11

© Alzahra University, Tehran, Iran , P.Code: 1993891176 Tel:(+9821) 88044040 Fax:(+9821)88035187 Send your Suggestions to : webmaster@alzahra.ac.ir

Figure-12





Figure-13



**RESEARCH ARTICLE** 

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# Effect of Organizational Learning on Organizational Performance in Saipa Automotive Co

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# **ABSTRACT**

In the current century, organizations should learn to generate new knowledge for effective competition in totally competitive markets so that their performance is improved. Today managers view learning as a viable phenomenon and for success, they nurture such organization which effectively and constantly improves performance through learning tool. Current research was conducted aiming at investigating effect of organizational learning on organizational performance of SAIPA Automotive Co. Thus, applied, correlation, descriptive survey was used as research method. Considering Cochran formula, 198 ones were selected from top, intermediate, and executive managers of the company (n = 401) using stratified sample method. The questionnaire proposed by Battor and &Battour's (2013) was provided to them. Validity of the questionnaire was confirmed by ideas of experts and its reliability was verified by Cronbach alpha. Results of Kolmogorov-Smirnov test showed data have normal distribution. Results of regression test indicated organizational learning and its dimensions (commitment to learning, shared vision, open or systemic thinking) have effect on organizational performance in SAIPA Automotive Co.

**Key words**: commitment to learning, open or systemic thinking, Organizational learning, shared vision.



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#### INTRODUCTION

In the business based on today knowledge, competitive advantage is found increasingly in facilitation of working information process instead of access to specific resources and markets. Thus, knowledge and intellectual capital is introduced as the primary basis of achieving to major and strategic competencies for superior performance. In order to achievesustainable competitive advantage, paying attention to existing knowledge, effective use of it and creating structure for using new information and knowledge seems necessary and critical which should be specially considered by the organizations. According to Peter Senge (1990) the more global communication is increased and business gets more complex and dynamic, organizational learning should be taken into account more so that organizations utilize it as a sustainable competitive advantage for survival. In fact, organizational learning is an attempt for finding ways of creating sustainable competitive advantages for the organization. In the learning organizations, employees exit daily issues learning and mostly learn to add their knowledge and ability in performing works (Abasi and Saadat, 2010). Employees and their knowledge are valuableresources for the organization which should be managed and developed (Michael et al., 2010). In the knowledgeera, informed managers and experts attempt to manage knowledgeso that intelligent and learning organizations are created and explicitknowledgeis developed. Thus, performance of the organization is improved (Elahi and Heydari, 2008). These increasing changes force organizations to turn into learning organizations from traditional management and traditional organization. Undoubtedly, human resource is greatest capital in every organization and it has long been the foundation for progress of every organization. Improvement and optimization of human resource in order to increase organizational productivity is always considered by profit and non-profit organizations. According to management and organizational experts, evaluation of performance is a suitable solution for human resource optimization. That is, aim of performance evaluation should be improvement and promotion of employee performance (Rollins&Halinen, 2005). Instead of merely evaluating behaviors and results of performance of employees according to traditional system (once a year), they should be forced to have planning and their behaviors should be monitored and improved during the year and they should be aided in performance management and improvement and promoting their capabilities (Givarian et al., 2012).

Regarding importance of this issue it can be said investigation of trend for emergence of companies and organizations over last decade shows companies and organizations lose their adoptability to environment and they would be deemed to destruction if they are not compatible to the social and global changes, and they would lose their efficiency in economic competition area. Because organizations with traditional structures lack necessary power and flexibility for compatibility to surrounding changes resulting from economicglobalization and its complexities, and they have to change their structures for survival or they should be equipped with tools so that they can gain power to confront global changes. One of the main tools is creating learning organization and institutionalization of learning process in the organization with focus on full-scale organizational performance. Thus, current work aims at investigating effect of organizational learning and its dimensions include commitment to learning, shared vision, and open (systemic) thinking on organizational performance.

### **REVIEW OF LITERATURE**

Investigation of previous studies related to current research in industry area, the latest and most common similar studies with highest reference which support findings of this research include: Allameh and Moghadam (2010) in their work entitled "relationship between organizational learning and organizational performance, case study: NirooMohareke Unit, Iran Khodro Co." found there is significant relationship between organizational learning and organizational performance, because Pearson correlation coefficient between two variables is 0.51 with sig. level 0.002. Atefi (2008) in her work entitled "relationship between organizational learning components and organizational performance in Parsian Bank considering dimensions of learning organization" studied relationship between learning components and organizational performance in Parsian Bank and they usedWatkins and Marsick's model.



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According to this model, seven components of organizational learning, which are the same as dimensions of learning organization, are related to each other and they are also in relation with two components of organizational performance. Sanjaghi et al. (2011) in their work entitled "effect of team empowerment on relationship between transformational leadership and organizational performance (case study: R & D units in Tehran Oil Industry)" found though transformational leadership has no direct effect on organizational performance, team empowerment playspositive role effectively in relationship between transformational leadership and organizational performance. In other words, transformational leadership has positive significant effect on organizational performance through team empowerment in the statistical sample under study. Swee et al. (2012) in their work entitled "relationship between learning ability and organizational performance" conducted meta-analysis. Data were analyzed using meta-analysis software, Hunter and Schmidt software. Findings showed there is positive relationship between learning capability and organizational performance which support reliable findings for financial and non-financial performance.

The country's automotive industry, as part of the national economic system, plays active role in the national economy. It has faced challenges in recent years, main of which include extending competition among domestic and foreign automotive manufactures and increasing knowledgelevel and awareness of the customers and thus change in customer expectations and needs. Hence, if domestic automotive manufacturers can reach higher levels of customer satisfaction and loyalty using existing tools in modern marketing approaches they will achieve considerable outcomes. Since organizational performance is regarded as important in automotive industry of the country, it can be concluded that organizations should focus on organizational learning and organizational performance simultaneously to achieve success, and since no study has been conducted in this area, and need of SAIPA Automotive Co, as one of the leading companies in the country's automotive industry, research work on effect of organizational learning on organizational performance was considered as necessary. Thus, this company was selected and effect of organizational learning on organizational performance of the company was studied.

#### Organizational Learning

Learning is the process in which behaviors and mental models of the individuals change and they think and act in other ways. Thus, learning process realizes when change is observed in behaviors and performance of the individuals (Gheshlaghi, 1999). American Heritage Dictionary defines learning as follows: acquiring knowledge, understanding or domination through experience or study. Kimbel defines learning as follows: relatively sustainable change in behavioral power (potential behavior) which occurs as result of enhanced practice. In organization and management, learning occurs at individual, group, and organizational levels. 1. Individual learning: individual learning includes development of personal talent and capabilities in order to change in the behavior and potential behavior (Gary et al., 2013). 2. Group learning: it is the process through which talent and capabilities of the group members are developed and they are made aligned so that results are obtained which are desired by all (Peter Senge, 2003). 3. Organizational learning: it is ability of the organization for acquiring insight from its experiences and experiences of the other organizations and creating change in the performance based on new insight. Organizational learning is the process through which members of the organization discover the errors and attempt to correct them (Argyris and Schon, 2011). Organizational learning includes performance optimization process through more knowledge (Fiol& Lyles, 2009). Organizational learning theory emphasizes on the fact that organizations rely on feedback reception or compatibility to environmental conditions (like human mind), organizations learn from the experience, like intelligent animals and human, and they are involved in complex mental processes such as "prediction, identification, definition, design and solving problem". Organizational learning is one of systemic approaches to management and organization and it is considered as an open system with thinking and lives (Barent et al., 2008). According to Peter Senge (2003) main elements of the learning organization include 1. Mental models: in these organizations, all individuals put old thinking ways aside. 2. Personal mastery: in these organizations, individuals are self-conscious and openly treat others. 3. System thinking (open thinking): all members of the organizations learn how the whole organization works. 4. Shared vision: all members of these organizations identify and define their



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practical plans and they come to an agreement. 5. Tea learning: all members of these organizations cooperate for implementing the agreed plans (Barnet et al., 2008).

#### **Organizational Performance**

Performance means state or quality of function. Thus, organizational performance is a general construct which refers to the way of performing organizational operation. Performance includes describingeffectiveness and efficiency of previous actions. According to this definition, performance is divided into two elements: 1. Efficiency, which describes the way of using resources in production of services or products, that is, relationship between actual and optimal combination of inputs for producing certain outputs, and 2. Effectiveness, which describes degree of achievement to organizational goals (Rahnavard, 2003). One of the salient indexes for evaluation organizational utilization and its management is "return on investment". Return on investment depends on efficiency of human resource qualitatively and quantitatively. The most important goals of performance evaluation is providing information about working behaviors (Mvrhdvgryfyn, 2006). Ultimate goal of performance evaluation is increasing organization's efficiency and effectiveness, not punishment of the employees.

#### **Research Conceptual Model**

The author used Delphi technique and expert ideas in selecting research model so that the most suitable model is applied in the research. To this end, the author consulted experts and professors in public and private organizations and especially those who are totally familiar to environment of automotive company and investigated standard models for measurement of research variables. Finally, experts suggested using Battor and&Battour's model (2013) for measurement of variables because of compatibility with the employees in SAIPA Automotive Co. It should be noted in the basic conceptual model, there were three variables (organizational learning, organizational performance, and customer relationship management). In this research, the author investigated effect of organizational learning as independent variable and its dimensions on organizational performance as dependent variable. Main research hypothesis includes according to conceptual model in Fig 2: organizational learning has significant effect on organizational performance of SAIPA Automotive Co. here, organizational learning is independent variable with three dimensions (components) including commitment to learning, shared vision, and open (systemic) thinking, and organizational performance is dependent variable. In line with main hypothesis, organizational learning has significant effect on organizational performance in SAIPA Automotive Co. Minor research hypotheses are as given in Table 1.

# **METHODOLOGY**

Current research is of correlation type. In addition, since author investigates existing status, thus it is descriptive study and since author uses questionnaire tool and distributes it among statistical population, current research is survey type in terms of the method. Finally, since research is done as case study (SAIPA Automotive Co.) and the results are to be applied and used in the statistical population, it is applied research in terms of nature. Research statistical population includes top, intermediate and executive managers in SAIPA Automotive Co. their numbers was 401 in 2014. Since their number is specified and known, Cochran formula was used for determining minimum necessary sample size, and it was obtained as 196. The questionnaire with items classified in Likert scale was distributed among 210 ones among research population and finally 198 completed questionnaires was used as analysis basis. The questionnaire used in the research was derived from Battor'sstandard questionnaire. It was divided into two parts: organizational earning as independent variable and its dimensions (commitment to learning, shared vision, open thinking (11 items)) and organizational performance as dependent variable and its dimensions (financial performance and market performance) (6 items). In the current research, descriptive statistics (tables and graphs of frequency distribution, dispersion and central indexes) and inferential statistics (SPSS software) were used



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for data analysis. For rejection or supporting normality of distribution in population, Kolmogorov-Smirnov test was used. Results of this test in Table 2 indicate that since significance level of research variables and its dimensions is larger than 0.05, thus distribution of research data is normal. Hence, parametric test can be used for testing research hypothesis. Bivariate linear regression and one-sample t-testwere used to test researchhypotheses.In order to investigatereliability of items in questionnaire, considering using standard questionnaire derived from Battor and&Battour's model (2013), the validity was supported. But for higher assurance, the questionnaire was given to experts and professors and they were asked about each item and evaluation of the related purpose, and the questionnaire was confirmed by some particle corrections. In order to verify reliability of the questionnaire, Cronbach alpha formula was used. In this research, Cronbach alpha was larger than minimum (0.7) according to Table 3, thus the questionnaire has high reliability.

#### **RESEARCH FINDINGS**

Research descriptive results showed among 198 samples, 3 percent were at age 26 to 30 years, 23.2 percent were at age 31 to 35 years, 20.2 percent were at age 36 to 40 years, and 53.3 percent of them had above 41 years. 15.2 percent of respondents had 2-10 years of working experience, 65.7 percent of them have 11 to 20 years of working experience, and 19.2 percent had 21 to 30 years of working experience. Almost 85 percent of respondents had over 10 years of working experience which suggests their experience. In terms of educational level, results showed 27.3 percent of respondents have BA degree, 68.7 percent of them had MA degree, and 4 percent of them had PhD degree. That is, about 70 percent of them had MA and PhD degree, suggesting high level of education in the company. 7.1 percent of respondents had top management position, 17.7 percent had intermediate management position, and 75.3 percent has operational management position, suggesting that about 75 percent of respondents are closely associated to operational environment. In the Battor and Battour's model, some components have been considered for each of main variables of organizational learning and organizational performance. Commitment to learning, shared vision, and open thinking are components of organizational learning. Financial performance and market performance are components of organizational performance variable. Table 4 indicates mean of scores of components for main variables (organizational learning and organizational performance) in the research population. As observed in the Table, results in mean column suggest score lower than 4 for all components. It indicates unsuitability of these components in the view of employees in the company under study. In addition, according to mean of scores for all components of learning and organizational performance in SAIPA Co., components of commitment to learning (3.52) and financial performance (2.10) had highest and lowest score. Thus, financial performance, higher attention should be paid to this component for higher organizational performance.

In this research, effect of organizational learning as independent variable on organizational performance as dependent variable was investigated using bivariate linear regression analysis, and significant relationship was observed between two variables according to Table 5.

#### **Major Research Hypotheses**

Organizational learning has significant effect on organizational performance of SAIPA Automotive Co.In order to predict changes of organizational performance in SAIPA Automotive Co through organizational learning and investigate their relationship, bivariate linear regression analysis was used. Correlation coefficient between organizational learning and organizational performance in SAIPA Automotive Co. indicates that correlation coefficient between two variables is 0.429 at significance level P = 0.000. Considering adjusted coefficient of determination (0.180), organizational learning has significant effect on organizational performance of SAIPA Automotive Co. (P < 0.01). In other words, about 0.180 changes in performance variable is justified by learning variable.



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**Research Minor Hypotheses** inear regression analysis was used. Correlation coefficient between commitment to learning and organizational performance in SAIPA Automotive Co. indicates that correlation coefficient between two variables

Commitment to learning has significant effect on organizational performance in SAIPA Automotive Co. In order to predict changes of organizational performance in SAIPA Automotive Co through commitment to learning and investigate their relationship, bivariate I s is 0.224 at significance level P = 0.000. Considering adjusted coefficient of determination (0.045), commitment to learning has significant effect on organizational performance of SAIPA Automotive Co. (P < 0.01). In other words, about 0.045 percent of changes in performance variable is justified by commitment to learning variable. Shared vision has significant effect on organizational performance in SAIPA Automotive Co. In order to predict changes of organizational performance in SAIPA Automotive Co through shared vision and investigate their relationship, bivariate linear regression analysis was used. Correlation coefficient between shared vision and organizational performance in SAIPA Automotive Co. indicates that correlation coefficient between two variables is 0.339 at significance level P = 0.000. Considering adjusted coefficient of determination (0.110), commitment to learning has significant effect on organizational performance of SAIPA Automotive Co. (P < 0.01). In other words, about 0.110 percent of changes in performance variable is justified by shared vision variable.

Open thinking has significant effect on organizational performance in SAIPA Automotive Co. In order to predict changes of organizational performance in SAIPA Automotive Co through Open thinking and investigate their relationship, bivariate linear regression analysis was used. Correlation coefficient between Open thinking and organizational performance in SAIPA Automotive Co. indicates that correlation coefficient between two variables is 0.468 at significance level P = 0.000. Considering adjusted coefficient of determination (0.215), Open thinking has significant effect on organizational performance of SAIPA Automotive Co. (P < 0.01). In other words, about 0.215 percent of changes in performance variable is justified by Open thinking variable. Results obtained from testing research hypotheses are given in Tables 5 and 6. Considering results in Tables 5 and 6, organizational learning and its dimensions including commitment to learning, shared vision, and open thinking has significant effect on organizational performance. As observed in Table 6, per one unit increase in organizational learning, 0.489 unit increase in organizational performance in SAIPA Automotive Co. Per one unit increase in shared vision, 0.319 unit increase is observed in organizational performance in SAIPA Automotive Co. Per one unit increase in open thinking, 0.405 unit increase is observed in organizational performance in SAIPA Automotive Co. Per one unit increase in open thinking, 0.405 unit increase is observed in organizational performance in SAIPA Automotive Co. Per one unit increase in open thinking, 0.405 unit increase is observed in organizational performance in SAIPA Automotive Co.

As observed in standardized coefficients, open thinking component has highest effect on organizational performance variable with standard Beta as 0.468 and commitment to learning component has lowest effect on organizational performance with standard Beta as 0.224. That is, SD in open thinking component improves organizational performance variable by 0.468, and decreased SD in open thinking component leads to reduction in organizational performance variable by 0.468. Also, results from regression analysis indicate organizational learning variable and its components have positive significant relationship with organizational performance variable. That is, there is positive direct relationship between organizational learning and this variable. According to studies and considering standard coefficients related to regression analysis, regression model in the current research can be formulated as follows using following regression equations in order to predict organizational performance in SAIPA Automotive Co. by organizational learning, commitment to learning, shared vision and open thinking:Organizational performance in SAIPA Automotive Co = 1.785 + commitment to learning (0.186) Organizational performance in SAIPA Automotive Co = 1.552 + shared vision (0.319)Organizational performance in SAIPA Automotive Co = 1.259 + open thinking (0.405)Diagram 1 indicates effect of organizational learning variable and its dimensions on organizational performance in SAIPA Automotive Co. which is directly specified using arrows.



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#### **CONCLUSION AND RECOMMENDATIONS**

Today is era of rapid changes and uncertainty toward the future and lack of adequate available information for decision making for managers. In the varying and changing world of today, if organizations rely just on their previous information, they would not remainsustainable. The key for solving problems of organizations is organizational learning and organizations are successful which seek for developing organizational learning rapider than others. Transformational, dynamic and optimal organizations are learning ones. Development of learning cultureincreases the number of stakeholders especially customers of the organization. Thus, learning organization can fulfill satisfaction of a high number of customers and act effectively in increasing and promoting productivity using various strategies such as product quality, etc. awareness of organizational learning is an important step in understanding the organization and investigating behavior and performance of the organization's members. Organizational learning improves organizational performance like leverage. Thus, current work studied and measured severity of effect of organizational learning on organizational performance of SAIPA Automotive Co. theoretical foundations and analytical findings of the collected information through field study suggest positive significant relationship between organizational learning and organizational performance in SAIPA Automotive Co. the main research hypothesis was tested by three minor hypotheses and all hypotheses were supported. Findings of the research show all three components of organizational learning including commitment to learning, shared vision, open thinking are present in SAIPA Automotive Co. which suggests supporting Battor's organizational learning model. Results for investigating organizational learning status on organizational performance denote that in the organization under study, commitment to learning component has better status compared to other components. That is, in this company, employees have deep understanding about the goals and commitment to continuous learning and high level of professionalism is dominant in the company. Regression coefficients obtained from Table 6 denote open thinking component is an influential factor on organizational performance of the company. In addition, this dimension of organizational learning in Battor's model has highest effect on company's organizational performance. Thus, if the employees do not have partial attitude and learn how the whole organization works and organizationallearning occurs in open thinking, financial performance of the company will be improved. According to research findings, open thinking is the most important factor in organizational learning. Results of investigating dimensions of organizational learning suggest that organizational learning has significant effect on organizational performance in the company under study, and improves working processes and may influence performance of SAIPA Automotive Co. findings in this work are consistent by findings by Swee et al. (2012), Sanjaghi et al. (2011), Allameh and Moghadam (2010) and Atefi (2008). According to findings by these authors, organizational performance is influenced by organizational learning and findings of the current research support findings by these authors regarding organizational learning effect on performance of the companies under study, and findings by the current research are consistent with their findings. Thus, considering supporting significant effect of organizational learning on organizational performance in SAIPA Automotive Co. and results for supporting hypotheses about effect of organizational learning on organizational performance, following recommendations are made regarding research hypotheses:Implementation of knowledge management system in SAIPA Automotive Co. using international software such as planning management and project control system can help development of organizational learning in the organization. Since SAIPA Automotive Co. is constantly implementing product development projects and production line development, using project management system based on Project Management Body Of Knowledge(PMBOk) may develop organizational learning level. In addition to cost reduction and project risk management, product development time is reduced and there are high effects on organizational performance and it leads to organizational learning effect on organizational performance in the company under study. Implementation of factory management system in SAIPA Automotive Co. is modeled from Renault-Nissan Company. Considering various management tools (e.g.Kaizen) which are present in this system, its achievement maconsiderably help in reducing wastes and increasing speed, production, and commitment to learning in SAIPA Automotive Co.



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Changing leadership level of the company from participatory leadership style to delegating leadership style, formation of thinking room, in which all members from expert to top management, regardless of their organizational status, have single vote right, and in which basic issues of the organization are investigated and proposals are given based on the voters, may develop open thinking in the company. Developing multi-disciplinary teams, in which individuals from different levels of the organization are member and referring various working issues to the teams may improve status of organizational learning and its dimensions in SAIPA Automotive Co.

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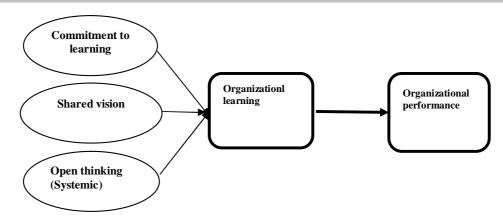


Fig 1. Research conceptual model (derived from Battor and&Battour's model)

**Table 1: Research minor hypotheses** 

Commitment to learning has significant effect on organizational performance in SAIPA Automotive

Shared vision has significant effect on organizational performance in SAIPA Automotive Co.

Open (systemic) thinking has significant effect on organizational performance in SAIPA Automotive Co.

Table 2: Statistics related to Kolmogorov-Smirnov test

Variable	Organizational	Organizational	Commitment	Shared vision	Open
	learning	performance	to learning		thinking
Kolmogorov-	1.554	1.872	1.862	2.312	2.439
Smirnov					
statistics					
Sig. level	0.199	0.100	0.200	0.098	0.070

Table 3: Cronbach alpha coefficient

No.	Dimension	Cronbach alpha	Variable	Cronbach alpha
		coefficient		coefficient
1	Commitment to learning	0.739	Organizational	0.818
2	Shared vision	0.799	learning	
3	Open thinking	0.706		
4	Financial performance	0.777	Organizational	0.80
5	Market performance	0.769	performance	



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Table 4: Total score of research variables and their dimensions

Variables & their	Total score					
dimensions	Mean	SD	Variance	Min.	Мах.	
Organizational Learning	3.09	0.518	0.269	2.09	5.00	
Commitment to learning	3.52	0.711	0.506	2.25	5.00	
Shared vision	2.78	0.628	0.395	1.50	5.00	
Open Thinking	2.91	0.683	0.467	1.76	5.00	
Organizational Performance	2.44	0.591	0.350	1.91	4.67	
Financial Performance	2.10	0.812	0.660	1.00	4.50	
Market performance	2.61	0.618	0.382	1.25	4.75	

Table 5: Overall determinants of regression analysis for effect of organizational learning variable and its dimensions on organizational performance variable in SAIPA Automotive Co

Variable	Statistical Index	Correlation	R <sup>2</sup>	Adjusted	F	Sig.
		coefficient		R <sup>2</sup>		level
	Regressionmodel					
Organizational	1	0.429	0.184	0.180	44.107	0.000
learning						
Commitment to	1	0.224	0.050	0.045	10.317	0.000
learning						
Shared vision	1	0.339	0.115	0.110	25.432	0.000
Open thinking	1	0.468	0.219	0.215	0.215	0.000

Table 6: Regression coefficients of organizational learning variable and its dimensions on organizational performance in SAIPA Automotive Co

Variable	Statistical Index model	Regression coefficients	Standard error	Standard Beta	Т	Sig. level
Organizational	Constant	0.930	0.231		4.031	0.000
learning	Organizational learning	0.489	0.074	0.429	6.641	0.000
Commitment to	Constant	1.785	0.208		8.565	0.000



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learning	Commitment to learning	0.186	0.058	0.224	3.212	0.002
Shared vision	Constant	1.552	0.181		8.583	0.000
	Shared vision	0.319	0.063	0.339	5.043	0.000
Open thinking	Constant	1.259	0.164		7.679	0.000
	Open thinking	0.405	0.055	0.468	7.407	0.000

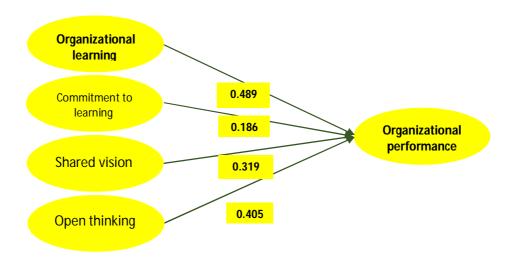


Diagram 1. Regression effect of organizational learning variable and its dimensions on organizational performance in SAIPA Automotive Co



#### **RESEARCH ARTICLE**

# Analysis Dimensions of Policy Development of Advanced Information Systems (Smart), Management Strategy to Improve the Situation and Gain Competitive Advantage of Public Organizations by using Fuzzy Logic

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# **ABSTRACT**

In recent years we have seen wonderful advances ininformation technology. Changes that have Significant impact on human life. Information technology has wide applications in various fields, One of the applications is advanced information systems (smart). It seems smart systems, able to simulate the behavior of intelligent. One of them featuring is that could think and actlike humans. Governments inmany countries, have Developed institutions and special programs in order to promote this technology. The main objective of this research is the identification dimensions of policy development of advanced information systems (smart) to improve the situation of public organizations by using fuzzy logic from the perspective of IT professionals in government agencies in the city of Zahedan. Inthisstudy,we used the Fuzzy AHP and fuzzy Delphi method to identify and rating of the options. The results confirmed 6 dimensions and 16 options and options way of formulating both specific and general policy, Indirect involvement of government, formation and entrepreneurship in the growth stage, policy support



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infrastructure products and supporting the ICT field, followed or later development strategy, primary responsibility to Technology guiding by public sector havea higher preference to other options.

**Key words**: Information Technology, Intelligent systems, Policies, Fuzzy Delphi method, Fuzzy AHP method.

#### INTRODUCTION

In this age of information, almost all fields of endeavour such as education, manufacturing, research, games, entertainment, and business treat information systems as a need. Indeed, every activity in our daily life today requires people to get involved in the use of information systems (OECD, 2013). An information system (IS) is a computerized database designed to accept, store, process, transform, make useful, and analyze data and to report results, usually on a regular, ongoing basis (Schirl&Sieler, 2012). It is often construed as a larger system including not only the database and the software and hardware (see information technology) used to manage it but also including the people using and benefiting from it and also including all necessary manual and machine procedures and communication systems(Sharif& Al-Karaghouli, 2011). The term is however also used in the broader sense of any means for communicating knowledge from one person to another, such as by simple verbal communication, punched-card systems, optical coincidence systems based on coordinate indexing, and completely computerized methods of storing, searching, and retrieving of information (Tsai & Cheng, 2012). The term is also sometimes used in more restricted senses to refer to only the software used to run a computerized database or to refer to only a computer system (Roztocki&Weistroffer, 2008). The plural term information systems (construed as singular) is also used for the academic study of the field, in other words for the study of complementary networks of hardware and software that people and organizations use to collect, filter, process, create and distribute data(Marks, 2011).Smart systems are miniaturized devices that incorporate functions of sensing, actuation, and control in order to describe and analyze a situation, and make decisions based on the available data in a predictive or adaptive manner, thereby performing smart actions. In most cases the "smartness" of the system can be attributed to autonomous operation based on closed loop control, energy efficiency, and networking capabilities (Hamaker& Hutton, 2005).Since theinformation technologyhasseveralpotential advantages. Development and deployment of these technologies is not enoughto getthesebenefits. In the event ofnon-acceptanceand deploymentof newtechnologiesby userswill remaininconclusive investing in the domain of interest (Curry & Moutinho, 2012). Therefore, in the sestudy we discuss of policyinthe field ofintelligent systemstechnology andweseekanswersto the following questions: What are thepolicydimensionsintelligent systemsandtheir choices?Due to limitations of the government implements and emphasis on environmental unstable conditions (economic and commercial) What isthe best optionforthe knowndimensions?

# Information system and Smart systems

Information system, an integrated set of components for collecting, storing, and processing data and for delivering information, knowledge, and digital products. Business firms and other organizations rely on information systems to carry out and manage their operations, interact with their customers and suppliers, and compete in the marketplace. For instance, corporations use information systems to reach their potential customers with targeted messages over the Web, to process financial accounts, and to manage their human resources (Delak&Bajec, 2013). Governments deploy information systems to provide services cost-effectively to citizens. Digital goods, such as electronic books and software, and online services, such as auctions and social networking, are delivered with information systems. Individuals rely on information systems, generally Internet-based, for conducting much of their personal lives: for socializing, study, shopping, banking, and entertainment (Bayuk, 2009). As major new technologies for recording and processing information have been invented over the millennia, new capabilities have appeared. The invention of the printing press by Johannes Gutenberg in the mid-15th century and the invention of a mechanical calculator by Blaise



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Pascal in the 17th century are but two examples. These inventions led to a profound revolution in the ability to record, process, and disseminate information and knowledge (Castano, 2012). Smart Systems provide novel enabling functionalities and as such are currently a driving force behind product innovation. Smart Systems are therefore crucial for the competitiveness of companies and entire industry sectors (Saad et al., 2013). In many ways Smart Systems development will be decisive for solving the big challenges of mankind, such as an aging society, increasing energy demand and environmental problems, etc. The global demand for highly integrated Smart Systems will increase dramatically in the years to come (Visser et al., 2013). High growth rates are particularly expected in the area of medical technologies, mobility and security, and in the consumer and communication sector. The need for higher resource efficiency, reduction of emissions and the increasing demand for "portable" solutions will further stimulate the Smart Systems market. Not just its potential high volume markets but also the high added value of Smart Systems manufacturing make this technology particularly attractive (Petter et al., 2008).

Smart systems typically consist of diverse components:

Sensors for signal acquisition,

Elements transmitting the information to the command-and-control unit,

Command-and-control units that take decisions and give instructions based on the available information,

Components transmitting decisions and instructions,

Actuators that perform or trigger the required action(Petter et al., 2008).

A major challenge in smart systems technology is the integration of a multitude of diverse components developed and produced in very different technologies and materials. Focus is on the design and manufacturing of completely new marketable products and services for specialized applications (e.g., in medical technologies), and for mass market applications (e.g., in the automotive industries) (Namani, 2010). In an industrial context, and when emphasizing the combination of components with the aim of merging their functional and technical abilities into an interoperable system, the term "smart systems integration" is used. This term reflects the industrial requirement and particular challenge of integrating different technologies, component sizes, and materials into one system(Nath&Badgujar, 2013). The systems approach calls for integrated design and manufacturing and has to bring together interdisciplinary technological approaches and solutions (converging technologies). Manufacturing companies as well as research institutes therefore face challenges in terms of specialized technological knowhow, skilled labor, design tools, and equipment needed for the research, design and manufacturing of integrated smart systems (Marks, 2011).A lot of smart systems evolved from microsystems. They combine technologies and components from microsystems technology (miniaturized electric, mechanical, optical, and fluidic devices) with other disciplines like biology, chemistry, nanoscience, or cognitive sciences (Sharif & Al-Karaghouli, 2011). There are three generations of smart systems:First-generation smart systems: object recognition devices, driver status monitoring, and multifunctional devices for minimally invasive surgerySecond-generation smart systems: active miniaturized artificial organs like cochlear implants or artificial pancreas, advanced energy management systems, and environmental sensor networksThird-generation smart systems: combine technical "intelligence" and cognitive functions so that they can provide an interface between the virtual and the physical world(Delak&Bajec, 2013).

#### Research Model

As mentioned, in this study we followed Analysis Dimensions of Policy Development of Advanced Information Systems (Smart), Management Strategy to Improve the Situation and Gain Competitive Advantage of Public Organizations By using Fuzzy Logic.



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#### A review of fuzzy Delphi method

Fuzzy Delphi method was developed in the 1980s by Kaufman and Gupta. Application of this approach is to decision-making and consensus on issues that are not clear goals and parameters is a very significant result. This feature provides a flexible framework that covered many of the barriers related to lack of precision. Implementation of the fuzzy Delphi method combines the Delphi method and analysis on the data with definition of fuzzy set theory. Expert opinions often are offered in the form of minimum, most likely value (triangular fuzzy numbers), then the average of the experts (number given) and the difference is calculated as the sum of the average person, and then it's going to take reviews Experts with new posts. Then each expert based on the data from the previous stage, offers a new view or modifies his previous comment. This process continues until it is stable enough for average fuzzy numbers.Fuzzy Delphi Method, communication with experts is the same as Fuzzy Delphi Method yet an improved and elaborative statistical tool is used to reach in better conclusions. In the first stage of the fuzzy Delphi method, Experts are selected and are justified in particular the subject method and period of investigation. Some of the main features for Experts are as follows: Are involved with the problem discussed, havecontinuous informationfrom problem to continue cooperation, have sufficient incentive to participate in the Delphi process and feel information obtained from a collective (Asghar pour, 2004). Since the location scope agreement would be valuable for their own. Among the 167 persons of ICT experts, 133 people were selected randomly by using the sampling formula from limited community.

$$n \geq \frac{\left(N\right) * \left(Z_{\frac{\alpha}{2}}^{2}\right) * \left(p\right) \left(1-p\right)}{\left(N-1\right) * \left(E^{2}\right) + \left(Z_{\frac{\alpha}{2}}^{2}\right) * \left(p\right) \left(1-p\right)}$$

In this study, components of the formula are:

N=167,  $z_{\alpha/2}^2$  = 1.96, P=(1-P)=0.5, E=0.06 and  $\alpha$ =0.05. At the table below (table1) is presented the sample.

As noted, the objective of the questionnaire is awareness from opinions of experts about the identify dimensions of policy development of advanced information systems (smart). Therefore, Experts should express "amount" values through the variables. Qualitative variables, gives more freedom to the Experts. The use of qualitative variables such as "low", "medium", "high"can be solve the problem to some extent. Individuals comments to qualitative variables are not the same. Since the experts have different features and if answering to the options are based on different mentality then analysis of variables would become worthless. So by definition the range of qualitative variables, Experts will answer questions with the same mentality. So, qualitative variables are defined trapezoidal fuzzy numbers. In Figure 1. After three stages of fuzzy Delphi method, achieve the desired result. And all of the options identified in the research was approved by all respondents.

#### **Fuzzy Analytical Hierarchy Process**

FAHP methodology based on the concept of fuzzy set theory was introduced by Professor Lotfizadeh is founded in 1965. Multi-criteria decision making process is required to select the best among the alternatives (ErdoğanAktan and Tosun, 2013). To achieve the best ranking of DMUs, fuzzy analytical hierarchy process (FAHP) is applied (Alem et al., 2013). The FAHP is used to compute the criteria weights whereas fuzzy (Ilangkumaranaetl., 2012). In addition to the use of fuzzy scale for expressing the expert's opinion, the vagueness and uncertainty which exist in expert's opinion is considered in the proposed FAHP method (Rezazadeh at al., 2012).



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The fuzzy AHP, a hierarchical structure for the problem that must be solved in order to show the relative importance of factors associated with use of fuzzy measures of relative scales. Thus, a fuzzy judgment matrix is constructed, the final scores of options offered by fuzzy numbers, and choose the best is achieved from ranking fuzzy numbers with using of specific algebraic operators (Duran and Aguilo, 2008). Concepts and definitions of hierarchical analysis fuzzy AHP according to analysis method developed. When decision makers are faced with a complex and uncertain issue of uncertain proportions as their comparative judgments "about twice as important" or "Between two to four times less important" Outlines steps and the standard AHP approach to prioritization vector can be considered as the special procedures (Duran and Aguilo, 2008). In 1996, a Chinese researcher named 'Young Chung presented "developed an analysis methods. In this methodology, the triangular fuzzy numbers of all elements of the judgment matrix and weight vector by this method, is used in most studies due to the simplicity of calculations (Wang at al, 2007).

Assuming  $\widetilde{A} = \left\{ \widetilde{M}_{ij} \right\}$  was be matrix of fuzzy paired comparison, which is defined as follows:

$$\widetilde{A} = \begin{bmatrix} 1 & \widetilde{M}_{12} & \dots & \widetilde{M}_{1n} \\ \widetilde{M}_{21} & 1 & \dots & \widetilde{M}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \widetilde{M}_{n1} & \widetilde{M}_{n2} & \dots & 1 \end{bmatrix}$$

Now to solve the model using EA,in each row of a matrix of paired comparisons, the value of  $S_k$  that is a triangular fuzzy number is calculated as follows:

$$S_k = \sum_{j=1}^n M_{kj} * \left[ \sum_{i=1}^m \sum_{j=1}^n M_{ij} \right]^{-1}$$

In which, k represents the number of rows i and j, indicates options and indicators respectively. In this way,after the calculation  $S_k$  should be achieved their large degree than together. In general, If  $M_1$  and  $M_2$  were be two triangular fuzzy number, large degree is defined as follows:

$$\begin{bmatrix} V (M_{1} \ge M_{2}) = 1 & M_{1} \ge M_{2} \\ \\ V (M_{1} \ge M_{2}) = hgt (M_{1} \cap M_{2}) \end{bmatrix}$$

And if not, we have:

$$hgt (M_1 \cap M_2) = \frac{u_1 - l_2}{(u_1 - l_2) + (m_2 - m_1)}$$



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To calculate the indicators weight in the matrix of paired comparisons we act as follows:

$$W'(X_i) = \min\{V(S_i \ge S_k)\}\$$
  $k = 1, 2, ..., n, k \ne i$ 

Therefore, the vector of indicators weight as follows:

$$W' = [W'(X_1), W'(X_2), ..., W'(X_n)]^t$$

That is the vector of fuzzy AHP abnormal coefficients. Based on the equation  $W_i = \frac{W_i'}{\sum W_i'}$ 

Normalize weights and achieve index (Azar and Farajy, 2008). The results of the ranking factors using fuzzy AHP are shown in Table 2.

# CONCLUSION

Inrecent years, given that thenew technologyisadvancing rapidly, there arenew ways todeliverpublic services tocitizens which is muchmore convenientand costlevelsarecommonways. Set of these new approaches, would provide better government services to citizens. Serviceoffered bysmart systemswouldprovide better, fasterand withfewerrestrictionstocitizens. Policy development of new technologies such as smart systems is of particular importance. Inthisstudy, we investigated dimensions and options of policy in the area of intelligent systems and the ranking of options. results of the fuzzy Delphi Confirmed the 6 dimensions and 16 options and the results of fuzzy AHP method showed that way of formulating both specific and general policy, Indirect involvement of government, formation and entrepreneurs hip in the growth stage, policy supporting rastructure products and supporting the ICT field, followed or later development strategy, primary responsibility to Technology guiding bypublic sector have a higher preference to other options. advantage of ranking this option is given the constraints of the organizations that are calling for government services through intelligent systems, options with higher priority can help the machieve goals and better results are obtained with greater emphasis on their. The use of intelligent systems to organizations is highly recommended. However, their use results in increased costs for the organization. But the benefits derived from the use and application of appropriate can cover costs and more efficient and will save you time as well as.

Therearemany advantagesforusers including reaching therequired information in the shortest time without referring to the organization and avoid wasting time. Recommended if you have more market share and financial resources, the intelligent system is used, because then they can at least maintain their competitive advantages and have better position compared to competitors. It is suggested that if the conditions of use of new technologies such as intelligent systems is to provide and people can used more easily this technology and to achieve this vision that use of new technology can be practical than it and thus can be a competitive advantage for their organization. Adoption of new technologies such as smart systems on behalf of users is very important for managers of organizations. In this regard, it should be tried, users' needs and values, better known so as to provide reasonable grounds for the use of new technology.



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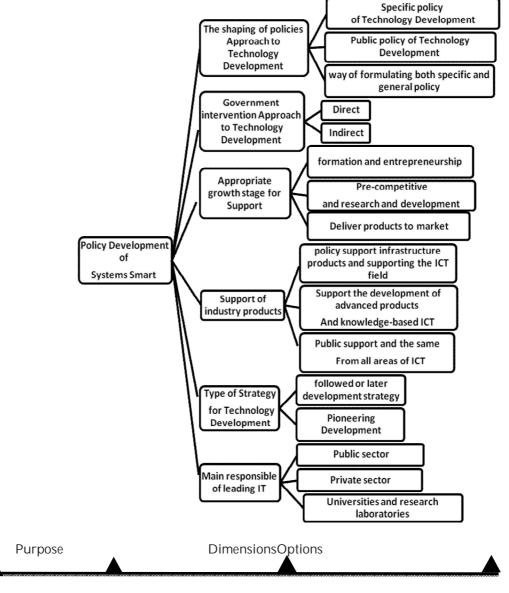


Figure 1. Research model



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Table1: Asampleresearch

Communities Number of communities		Number of samples
IT experts	47	42
providingpublic services Offices	120	91
Total	167	133

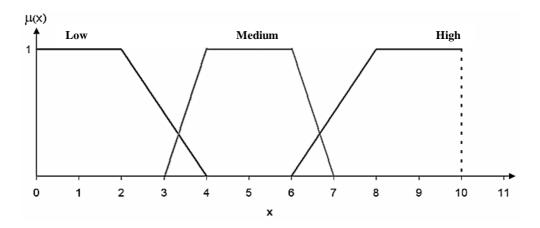


Fig2. Membership function of of linguistic variables

Table 2. Normalized relative weights Options

Row	Dimensions of Development Policy	options of Development Policy	Normalizedrelati
			ve
			weightsOptions
		Specific policy	0.040313
	The shaping of policies Approach	of Technology Development	
1	to Technology Development	Public policy of Technology	0.030313
		Development	
		way of formulating both specific	0.166688
		and general policy	
2	Government intervention	Direct	0.072688
	Approach to Technology		
	Development	Indirect	0.081688
		formation and entrepreneurship	0.030688
3	Appropriate growth stage for	Pre-competitive@and research	0.024313
	Support	and development	
		Deliver products to market	0.051313
		policy support infrastructure	0.003688
		products and supporting the	



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	·	•	
		ICT field	
4	Support of industry products	Support the development of	0.024313
		advanced products⊚And	
		knowledge-based ICT	
		Public support and the same®	0.026313
		From all areas of ICT	
5	Type of Strategy⊚ for Technology	followed or later development	0.013688
	Development	strategy	
		Pioneering Development	0.054313
		Public sector	0.246688
6	Main responsible of leading IT	Private sector	0.034688
		Universities and research	0.106688
		laboratories	



# RESEARCH ARTICLE

# A Survey of Effectiveness of Emotionally-Focused Couples Therapy on Increasing Marital Adaptation

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# **ABSTRACT**

The present study aimed to determine the effect of emotionally-focused couples therapy in family. The study method is quasi-experimental in pre-test and post-test. All couples in Ahvaz city in 2013-2014 with at least one year of their marriage were included in the study as study population. The sample includes 28 couples as selected among volunteer couples in sessions by voluntarily sampling method. Sixbey (2005) resiliency assessment scale is used for data collection. One-way covariance analysis test is used for data analysis. The results showed that emotionally-focused couples therapy was effective on family communication and problem-solving, increasing resiliency in utilizing social and economic resources , increasing resiliency in maintaining a positive outlook, increasing resiliency in ability to make meaning of adversity of couples.

Key words: couples therapy, Emotionally-focused, Family resiliency

# INTRODUCTION

Human being is a social creature and interaction with others is one of his basic needs. Family is one of the natural groups meeting the human being needs. The lack of required skills in constructive relation and coping up method with the problems as experienced by the family in growth stages and can be lead to outcomes as reduction of resiliency (KampDush and Taylor, 2012). Couples should receiverequired trainings for a healthy marriage in which the couples can have suitable resiliency to cope up with the life events and have conflict solution skills (Karahan, 2007). There are various methods to present training and suitable interventions in this regard and one of them is emotionally-focused couple's therapy. In emotionally-focused couples's therapy, it is assumed that marital conflict is



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occurred when the spouses can not meet their achievement needs for safety, security and satisfaction. In other words, problematic marital relations show couples failure in establishing a relationship with safe attachment model. These couples experience secondary emotional responses as anger, aggressiveness, retaliation or extreme guilt to meet each other attachment needs. Secondary emotional responses are shown in avoidant aggressive behaviors and they finally lead to marital conflict (Johnson and Greenberg, 2006). The researchers have found that effective attachment relations have independent performances and organizing of resources to improve resiliency (Lazarus, 2004). Thus, emotionally-focused approach with the mentioned features cansthe increase of couples's resiliency by providing safe attachment -based relations. Regarding the importance of family in resiliency, some researches consider family as a protective factor for people against hardships and risks (Bowen, Martin and Manchini, 2013). There is no wise study regarding how the family can be resilient as a unit (Becyar, 2013). As it was said, considering family resiliency and creation of attitudes and skills to make the families stable for effective coping with life events is of great importance. Thus, to provide required grounds for optimal performance of family in instabilities and crises of events and training positive conflict solution methods, educational and therapy interventions can be presented to the couples. Based on the strategies, the present study is necessary as emotionally-focused interventions can increase resiliency. There is no study evaluating the effectiveness of emotionally-focused couple therapy on increasing resiliency directly. Therefore, the present study is new and is necessary in terms of research and educational achievements.

# Study hypotheses

Emotionally-focused couples's therapy increases resiliency.

Emotionally-focused couples's therapy increases family communication and problem solving.

Emotionally-focused couples's therapy increases utilizing social and economic resources.

Emotionally-focused couples therapy increases maintaining a positive outlook.

Emotionally-focused couples's therapy increases family connectedness

Emotionally-focused couples's therapy increases family spirituality.

1.6 Emotionally-focused couples's therapy increases ability to make meaning of adversity of couples.

# Study variables

The present study has an independent variable including Emotionally-focused couples's therapy and a dependent variable as resiliency. It can be said resiliency as a dependent variable includes six dimensions as: 1- family communication and problem solving.2- utilizing social and economic resources. 3- Maintaining a positive outlook. 4-Family connectedness, 5- Family spirituality, 6- Ability to make meaning of adversity of couples. Therapist: All education sessions are performed by researcher (therapist of present study). Conceptual and operational definition of variablesConceptual definition: 1- Family resiliency: It is the ability of family to cope up with the changes under critical conditions, renovation and activation of balance after a crisis. Also, family resiliency is the family ability to return, survive, cope up with the difficulties and improvement (Valentine and Feinaaer, 1993). 2- Emotionallyfocused couple therapy: It is a combination of systematic and empirical approaches (Johnson, 2004). It is one of therapy methods considering negative stable interactive cycles due to deep emotional vulnerability. This method attempts to reduce confusion via intervention at emotional level for close interactions progress leading to much interest and intimate relations (Peluso, 2007). In this approach couple change process is performed in three stages as:1- Disturbing the negative interaction cycles, changing interactional conditions and integration of relations (Greenberg and Hunsley, 1999; Johnson, 2004). Operational definition: 1- Family resiliency: The score of each subject in family resiliency scale of Sixbey (2005) as general and in subscales 1- Family communication and problem solving, 2- Utilization of economic and social resources, 3- Maintaining a positive outlook, 4- Family connectedness, 5-Family spirituality, 6- Ability to make meaning of adversity of couples. 2- Emotionally focused couple therapy: It is an approach presented by Johnson and Greenberg (1980) in which communication and emotions are emphasized and are presented in 12 sessions to experiment group couples.



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# THEORETICAL BASICS

The researches have reported some of the features related to resiliency. These features include value, skill in problem solving, social adequacy, optimism and empathy (Benard, 1991). Researchers define family resiliency as the family ability to cope up with the changes in critical conditions, renovation of balance after crisis (Openshaw, 2011). According to Walsh model, key factors of family resiliency include: 1- Family beliefs system as including giving meaning to adversities, positive outlook and spirituality excellence. 2- Organizational models including flexibility, link and economic and social sources, 3-Walsh communication processes including clarity and vivid feeling revealing (Sixbey 2005). Emotionally -focused couple therapy is short-term, systematic and tested intervention applied to reduce confusion in romantic adulthood relations and creating safe attachment links. This approach is applied for couples and families. This approach is an inference-based one in which the clients are observed as experienced specialists. Key elements of experience as needs and fears of attachment are revealed in treatment session and they are no labeled to be ill. They are observed to be fighting with the problems arising from specific social context (Johnson et al., 2005). In emotionally-focused couple therapy, emotions are considered as the tendencies of action and form the basis of social relation and give some signs of nature of our social links. Emotion directs the couples to their needs, organize the response and behaviors of attachment and activate the basic recognitions about self, others and nature of relations. Also, emotion is an initial alarming system in interactions showing relation. Emotion expression directs the other side to specific responses and is the basis of interactions organizing (Asadour, 2011).

# **REVIEW OF LITERATURE**

Wood, Crane, Schaalje and Law (2005) in a meta-analysis study evaluated the studies regarding effectiveness of emotionally focused treatment by 2002. They found that emotionally focused treatment was effective on reduction of marital conflict of couples. Greenberg et al., (2008) in a study evaluated the Differential Effects of Emotion- focused therapy and psycho education infacilitating forgiveness and letting go of emotional injuries. The results of the study showed that emotion- focused therapy was effective on improvement of forgiveness and interpersonal interactions compared to psycho education. Michelle (2009) evaluated effects of emotionally focused couple therapy training on knowledge, competency and attachment security. The results of the study showed that emotionally focused treatment was effective on increasing knowledge, competency and attachment security and finally interpersonal interactions. Rasuli (2007) conducted a study "effectiveness of emotion-focused intervention (personal and mental method) on reduction of distress of the relationship of the couples with a child with chronic disease to present a method to Iranian couples. The results of the study showed that emotion-focused approach was effective significantly and could reduce the distress of relation and somatic-psychological symptoms in men and some by personal and group methods. Asadpour (2011) in a study evaluated the impact of emotion-focused treatment on increasing marital intimacy. The results of the study showed that emotion-focused therapy was effective on increasing couples intimacy. Javidi, Soleimani, Ahmadi and Samadzade (2013) in a study evaluated the effectiveness of emotionally-focused couple therapy on improvement of communication models of couples and found that emotionally-focused couple therapy can improve the scores of communicative models of subjects compared to control group. Sodani, Karimi, MehrabizadeHonarmand and Abdolkarim (2013) in a study investigated the comparison of two emotionally-focused couple therapy and uniform method to improve couples relations after discovery of infidelity. The study findings showed that uniform and emotionally-focused couple therapy can reduce the psychological problems of spouse infidelity and using these two approaches is recommended to work with the couples involved with marital infidelity.

### Study population and sample

The study population is all the couples of Ahvaz city investigated in 2014. The study sample is including 28 couples of the mentioned population and random sampling method is used to select them. In the experiment group, the



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subjects of age group 36-40 and 46-50 years old had the highest frequency about 42.9% and subjects of group 41-45 years old had lowest frequency about 14.3%. In control group, the subjects of age group 41 to 45 years old had the highest frequency with about 42.9% and subjects of age group 46-50 years as the lowest frequency with about 21.4% samples. The mean and standard deviation of age of each of groups are 43.79 and 4.15 years in experiment group and in control group as 42.64 and 3.85 years. IN experiment group, the subjects with BA had the highest frequency as 71.4% and subjects with Diploma and MA had the lowest frequency with about 14.3% sample and in control group, subjects with BA education had the highest frequency about 71.4% and subjects with Diploma had the lowest frequency about 7.1% of s ample. In experiment group, the subjects of age group with marriage duration 9-11 years had the highest frequency with about 64.3% and subjects of age group with marriage duration 6-8 years had the lowest frequency with about 7.1% sample and in control group, the subjects with marriage duration 12 to 14 years had the highest frequency about 50.0% and subjects with marriage duration 6-8 years had the lowest frequency with about 21.4% of sample. The mean and standard deviation of age of each of groups in experiment group are 10.64, 1.44 years and in control group as 10.50 and 2.27 years.

#### Measures

Family Resiliency assessment scale (FRAS): This scale is designed based on Walsh (2003) Family Resiliency systematic theory bySixbey (2005). It is composed of 66 items measuring 6 aspects of family resiliency. These six dimensions include: 1- family communication and problem solving.2- utilizing social and economic resources. 3-Maintaining a positive outlook. 4- Family connectedness, 5- Family spirituality, 6- Ability to make meaning of adversity of couples. Therapist: All education sessions are performed by researcher (therapist of present study). Psychometric evidences of this scale are supported by Sixbey (2005). Sixbey (2005) evaluated reliability of measure by Cronbach's alpha and its validity by construct validity, predictive and concurrent criterion validity. Cronbach's alpha is used to determine reliability of resiliency questionnaire in the present study as it is 0.96 for total questionnaire indicating the good reliability coefficients of the questionnaire. The reliability coefficients of resiliency questionnaire are ranging 0.60 to 0.96.

# Study design

This study applies pre-test and post-test empirical study with control group. The experiment and control groups are equal by random method and before empirical interventions regarding experiment and control groups, pre-test is performed about them and post-test is performed at the end of intervention. The difference of pre-test and post-test is evaluated in terms of significance of study. The training of effectiveness of emotion-focused couple therapy is considered as independent variable to define its impact on increasing resiliency of couples in Ahvaz city as dependent variable.

# **Procedure**

After selection of subjects, pre-test was performed on them and the participants in the study were divided into experiment and control group as 14 couples were in experiment group and 14 couples in control group. It can be said that in the study, control group received no intervention and training. After the end of emotionally-focused couple therapy sessions, post test was performed on both groups. Before receive emotion-focused therapy, the couples were evaluated in pre-test in terms of resiliency and after receiving emotion-focused therapy in post-test were evaluated in terms of resiliency to evaluate the effect of this approach on resiliency. The therapy sessions are presented by the present study researcher in 12 sessions (each week two sessions for 120min) were presented to experiment group couples.



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### Data analysis method

The following statistical methods are used for data analysis:

Descriptive methods as calculation of frequency, percentage, mean and standard deviation

Leven's test (to evaluate the equality assumption of variables variances)

Shapiro-Wilk test (to observe normality assumption of scores distribution in population)

Uni-variate covariance analysis (ANCOVA): In covariance analysis, interfering variables are controlled, it means that their effect from test scores is eliminated and then the mean of residual scores, study groups are compared. In the hypothesis test, in post-test stage, interfering variable is controlled, it means that its effect on post-test scores is eliminated and then residual scores mean of experiment and control groups is compared with each other. Cronbach's alpha method to calculate reliability coefficients For analysis of collected data, SPSS software, version 18 is used. For all hypotheses, significance level  $\alpha$ =0.05 is considered.

# STUDY FINDINGS

Descriptive results: In pre-test stage, the mean and standard deviation of resiliency of each of groups in experiment group are 134.50, 4.14, respectively, control group 158.21, 16.09, in post-test stage, the mean and standard deviation of experiment group are 169.57 and 13.98, respectively, control group as 149.14 and 17.88 and in resiliency variable regarding family communication and problem solving in pre-test and mean and standard deviation of each of groups are 68.29 and 2.89 in experiment group, in control group as 80.79 and 11.53, in post test stage, the mean and standard deviation in experiment group 87.36 and 5.56, in control group 75.79 and 11.62, in resiliency variable regarding utilization of social and economic sources in pre-test stage in experiment group as 20.00 and 2.25, control group as 21.36 and 2.49, in post-test stage, experiment group as 22.71, 3.31, control group 17.86 and 3.61, in resiliency in keeping a positive outlook in pre-test stage, the mean and standard deviation of each of groups in experiment group are 14.50, 1.09, respectively and in control group as 17.14 and 1.70, in post test stage, the mean and standard deviation in experiment group as 19.57 and 1.55, in control group 16.71 and 1.97 in resiliency in family connectedness in pretest, experiment group 15.14 and 1.35, in control group 17.43 and 1.69 in post-test, experiment group 18.93 and 2.26 and control group 17.21 and 2.19, in resiliency in family spirituality in pre-test, experiment group 9.36 and 0.842, control group 12.71 and 1.38, in post test, experiment group 11.36 and 1.90 and control group 11.36 and 1.90 and control group 12.29 and 0.726 and in resilience in ability to make meaning of adversity of couples in pre-test stage, experiment group 7.21 and 0.893, control group 8.79, 1.62 and in post-test stage, experiment group 9.64 and 0.745 and in control group 9.29 and 1.93. The findings of study hypotheses: Before evaluation of hypotheses to observe variance equality assumption of study variables, Leven's test is used. Based on the results of Leven's test, null hypothesis for equality of scores variances of two groups in all study variables is supported (except two variables). It means that scores variance assumption in experiment and control groups is supported. When samples volume is equal, the significance of Leven's test has no considerable impact on nominal alpha value. The results of Shapiro-Wilk test to evaluate normality of scores distribution shows that null hypothesis for normality of distribution of scores in both groups in resilience variable is supported. It means that normality of scores distribution in pre-test is supported in experiment and control groups. The results of test of evaluation of homogeneity of regression slops for resiliency variables show that F interaction values for similarity of regression line slope for all study variables is not significant. In other words, homogeneity of regression line slope is supported.

# **Evaluation of hypotheses**

Hypothesis 1-2 Emotionally-focused couple therapy increases resiliency in family communication and problem solving of the couples.



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By controlling pre-test among the couples, experiment and control groups show significant difference in terms of resiliency regarding family communication and problem solving (P<0.0001, F=30.07). Thus, hypothesis 1-2 is supported. In other words, emotionally-focused couple therapy based on the mean of component of experiment group couples in post-test compared to the mean of control group couples increased the component in experiment group. The impact is 0.54, in other words, 54% of individual differences in post-test scores of family communication and problem solving is about effect of emotionally-focused couple therapy. The statistical power is 1.00. Hypothesis 2.2 Emotionally-focused couple therapy increases resiliency in utilization of social and economic sources of the couples. By controlling pre-test among the couples, experiment and control groups show significant difference in terms of resiliency regarding utilization of social and economic sources (P<0.0001, F=18.67). Thus, hypothesis 2-2 is supported. In other words, emotionally-focused couple therapy based on the mean of component of experiment group couples in post-test compared to the mean of control group couples increased the component in experiment group. The impact is 0.43, in other words, 43% of individual differences in post-test scores of utilization of social and economic sources is regarding the effect of emotionally-focused couple therapy. The statistical power is 0.986Hypothesis 2.3 Emotionally-focused couple therapy increases resiliency in keeping a positive outlook of the couples. By controlling pre-test among the couples, experiment and control groups show significant difference in terms of resiliency regarding keeping a positive outlook of the couples (P<0.0001, F=28.10). Thus, hypothesis 2-3 is supported. In other words, emotionally-focused couple therapy based on the mean of component of experiment group couples in post-test compared to the mean of control group couples increased the component in experiment group. The impact is 0.53, in other words, 53% of individual differences in post-test scores of keeping a positive outlook of the couples is regarding the effect of emotionally-focused couple therapy (group membership). The statistical power is 0.999. Hypothesis 2.4 Emotionally-focused couple therapy increases resiliency in family connectedness the couples. By controlling pre-test among the couples, experiment and control groups show no significant difference in terms of resiliency regarding family connectedness of the couples (P>0.05, F=3.57). Thus, hypothesis 2-4 is not supported. In other words, emotionally-focused couple therapy based on the mean of component of experiment group couples in post-test compared to the mean of family connectedness control group couples didn't increase the family connectedness in experiment group. The impact is 0.12, in other words, 12% of individual differences in post-test scores of the mentioned component is regarding the effect of emotionally-focused couple therapy.

Hypothesis 2.5 Emotionally-focused couple therapy increases resiliency in family spirituality the couples. By controlling pre-test among the couples, experiment and control groups show no significant difference in terms of resiliency regarding family conflict in spirituality of the couples (P>0.05, F=0.765). Thus, hypothesis 2-5 is not supported. In other words, emotionally-focused couple therapy based on the mean of family spirituality component of experiment group couples in post-test compared to the mean of control group couples didn't increase the family spirituality in experiment group. The impact is 0.82, in other words, 82% of individual differences in post-test scores of the family spirituality is regarding the effect of emotionally-focused couple therapy .Hypothesis 2.6 Emotionallyfocused couple therapy increases resiliency in ability to make meaning of adversity of couples. By controlling pre-test among the couples, experiment and control groups show significant difference in terms of resiliency regarding ability to make meaning of adversity of couples. (P<0.001, F=15.08). Thus, hypothesis 2-6 is supported. In other words, emotionally-focused couple therapy based on the mean of ability to make meaning of adversity of couples. Component of experiment group couples in post-test compared to the mean of control group couples increased the component in experiment group. The impact is 0.37, in other words, 37% of individual differences in post-test scores of component is regarding the effect of emotionally-focused couple therapy. The statistical power is 0.962. One of the findings of study show that by entering individual features (age and duration of women marriage) as control variable in covariance analysis, the difference between resiliencies of two groups is significant. This shows that age and marriage duration has no effect on continuance of difference in resiliency of groups.



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# **DISCUSSION AND CONCLUSION**

Regarding the findings of evaluation of study hypotheses, we can say emotion-focused therapy develops two fields: Experiences and interactions. The first aim of therapy is achieving and then reprocessing the specific emotional responses as the lower section of limiting and uniform models of interactions. The second therapy goal is creating the new interactive events as the relation as comfortable security for spouses. Reprocessing of internal experiences is used as a method to develop interpersonal situations. Then, the positions are changed and structuring to new interactive events can provide development and recreation of internal experiences of each spouse. After the end of therapy and in case of its success, each spouse is the source of comfort, support and physical contacts for another person. Each spouse achieves helping another one to organize the negative emotions and creating positive and strong emotions to self (Hosseini, 2010; Harvey 2013, Gorman, 2008). Also, therapist emotion is negative during interactive cycle therapy and flexibility as involving the couples continuously and changes them. This duty is fulfilled by various methods as reforming the interactive situation as creating new responses and perceptions. Cutting interactive models is possible via some interventions as exchanging the fears and creating new method in speech (Johnson, 2010; Hosseini, 2010, Harvey, 2013). Thus, it is expected that marital conflicts of experiment group couples are reduced after being in emotionally focused therapy. Also, the results of one-way covariance analysis can be used to evaluate the hypotheses of the effect of emotionally focused couple therapy on increasing family resiliency and its dimensions and the residency scores of couples in post test showed significant increase compared to pre-test stage in general score of resiliency and dimensions as family connection, problem solving, utilization of social and economic sources, keeping a positive outlook, ability to make meaning of adversity of couples. This increase shows the effectiveness of emotionally-focused couple therapy of family resiliency and its dimensions. In other words, the results show that emotionally-focused couple therapy based on the mean of family resiliency and mentioned dimensions increased family resiliency in family connection and problem solving, utilization of social and economic sources, keeping a positive outlook, ability to make meaning of adversity of experiment group couples. Also, the results of one-way covariance analysis showed that there was no significant difference between couples in experiment and control groups in terms of family resiliency regarding increasing family connectedness and family spirituality. In other words, emotionally-focused couple therapy didn't increase resiliency in family connectedness and family spirituality in experiment group couples.

The results of effectiveness of emotionally-focused couple therapy are consistent with the findings of the study of Erfanmanesh (2009), Hassanabadi, Mojarad and Soltanifar (2011), Mirzade, Ahmadi and Fatehizade (2012), Ziaolhagh, Hassanabadi, GhanbariHashemabadi and ModaresQoravi (2012). Regarding these findings, we can say in emotionally-focused couple therapy, it is focused on initial emotional responses not considered, distinct, rejected. Mostly, therapy is started by therapist by giving credit to secondary responses as shown by couples as a part of confused cycle. In emotionally-focused couple therapy, emotions are processed and controlled differently and it leads to consistent responses. Limited, severe or non-processed emotional responses are recognized in therapy session security and in case of any change, the couples relations are turned to a place in which hard emotions can be regulated differently, being expressed consistently and are re-organized. Then, hidden emotions are experienced and expressed in interactive situations. The absence feeling hidden in critical anger or hopelessness and failure hidden in rejection can create new items of emotional involvement and modify problematic interactive cycles in couple therapy (Asadpour, 2011). Thus, it is expected that experiment group couples by receiving emotionally-focused couple therapy can increase family resiliency as the family ability to encounter changes under critical situations, renovation and activation of balance after crisis. Also, family resiliency is the family ability to return, survive, cope up with the difficulties (Valentine, L., and Feinauer).



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# Table 1- The summary of emotionally-focused couple therapy sessions

Twelfth session: Ending sessions: General analysis and performing post-test

First session: Establishing communication, initial evaluation and presenting logic of therapy
Second session: Evaluation of communication conflicts between the couples in terms of
attachment
Third session: Deep evaluation, interactive cycles of marital conflicts
Fourth session: Personal evaluation and identification of infrastructural emotions
Fifth session: Achieving unknown emotions as the infrastructure of interactive models.
Sixth session: Re-framing the problem via considering negative cycle
Seventh session: Increasing identification of emotions and some aspects of self
Eighths session: Facilitation of expressing needs and desires and emotional conflict
Ninth session: Reconstruction of interactive situations
Tenth session: Establishing and improving new situations and new cycles in relations
Eleventh session: Continuing consolidation and uniformity



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# **RESEARCH ARTICLE**

# Comparing the Self-Efficacy of Cosmetic Surgery Applicants: Emphasis on Frequent, First-Time, and Control-Group Applicants

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# **ABSTRACT**

This study has been conducted to compare self-efficacy in applicants of cosmetic surgery for the first time, frequent applicants, and the control group. This is a casual-comparative research. Statistical population included all people attended Tehran Sheikh Bahai Surgery Center in fall 1393; they were volunteers of plastic surgeries as the first time, third or more times, and the control group. The research samples were selected by convenience sampling and matched in terms of age, sex and education. The sample size for each group was 30 and Sherer Efficacy Test was conducted on them. The collected data were analyzed. Most applicants were aged 30 years and older. The number of female applicants were 8 times more than men, and most applicants were single and had university education. There was a significant difference (p=0.01) between self-efficacy among applicants of cosmetic surgery (once, three times and more) and the control group. There was not any significant difference between those who register for the first of third time. It should be noted that psychological factors play a major role in the demand for cosmetic surgery and not is everyone a good candidate for cosmetic surgery. Therefore, it is important to assess the psychological and personal characteristics of the patients by a psychiatrist or psychologist before performing cosmetic surgery and medical treatment.

**Key words:** cosmetic surgery, self-efficacy, frequently cosmetic surgery.



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# INTRODUCTION

Paying attention to appearance in a social context is t is normal, acceptable, and even in moderation, represents mental health. In modern societies, due to the excessive emphasis on beauty and images presented in fashion magazines, movies and media, this attention has taken an extreme form, especially among women (Mohammad Panah, Ardakani, Yaqoubi, Yousefi, 2012). Cosmetic surgery used to improve the appearance is a specialized action that deals with the reconstruction, maintenance or improvement of a person's physical appearance through surgical and medical techniques; it has significantly been increased in the past decade (Swami, Chamorro-Premuzic, Bridges, & Furn Harm, 2009). Since cosmetic surgery would be doing for changing appearance and increasing satisfaction and self-esteem, cosmetic surgery can be the result of a certain psychological pattern. It should be noted that there is little available information about the psychological state of those who trying to come back surgery, or psychological changes that followed by such a decision. According to a study carried out by Malick et al on candidates for cosmetic surgery, 47.7 percent of the applicants are suffer from psychiatric disorders such as body dysmorphic disorder, narcissistic and histrionic personality disorders associated with dissatisfaction after surgery (qtd. in Saba, Khanjani, 2012). Bandura's self-efficacy refers to feelings of adequacy, suitability and ability to cope with life. Persons with low sense of efficiency feel helplessness and they cannot control their routine events. Feeling low efficiency can destroy motivation, lessen aspirations 'level, interfere with cognitive abilities, and impose adverse impact on physical health. High efficiency feeling reduces the fear of failure, enhances the aspirations 'level, and improves ability of problemsolving and analytical thinking; it grows gradually. These early experiences of efficiency focus on parental behaviors in which parental behaviors can lead children to feel the high sense of performance and it is different in boys and girls. Kim (2003) conducted a research on 2200 high school students in Seoul, South Korea and he concluded that there are significant relationships among general self-efficacy, depression, anxiety, sensitivity and hostility. Muris (2002) studied the relationship between self-efficacy and symptoms of affective disorders in a large sample of normal Dutch adolescents; the results show that the lower levels of self-efficacy are accompanied by symptoms of anxiety, mental annoyance, and depression in high levels (qtd. in Hosseini Nasab, Ahmadian & Ravanbakhsh, 2005).

As cosmetic surgery has become a cultural and social issue, body managerial practices in this area reflects the ways of thinking, lifestyles, beliefs and personality traits, cultural changes and replacement of new norms and values in society. In spite of uncontrolled increase in apply for cosmetic surgery in Iran, psychological issues such as family interactions and their effects on the formation of personality traits has less been taken into consideration. Hence, it seems essential to pay more attention to psychological and familial aspects of tendency to cosmetic surgery. This article seeks to answer whether self-efficacy influences on increasing trend in cosmetic surgery or not.

### **Theoretical Foundations**

A surgical procedures to change a normal or near-normal to get a better look is called plastic surgery; the most common ones are rhinoplasty (nose surgery), mammoplasty (breast surgery), blepharoplasty (eyelid surgery), abdominoplasty (tummy cosmetic surgery) and lifting the face (facial cosmetic surgery). Plastic surgery is derived from the Latin word 'Platicus' meaning to shape and to mold. Plastic surgeon format and shape one's face or body to to be pleasant. According to the American Medical Association, plastic surgery contains two groups of methods. First, cosmetic surgery is surgical procedures to reshape normal structures of the body to improve the patient's appearance and self-confidence. Second, reconstructive Surgery; it is used for the abnormal characteristics of human body (usually the result of congenital, developmental abnormalities, infection, tumors or disease defects). In general, reconstructive surgery is performed to improve function, but also to create a more natural appearance applications. Beauty is quite common and natural tendency among all human beings. Nowadays, the tendency to beauty has reached the stage of show off and fetishism so that many people are trying to gain a greater share of beauty wit many expenses and accepting the consequences of mental and physical. Surgery and cosmetic procedures have increased greatly in recent years, but unconscious thoughts causing changes in body have not been recognized. It can be said



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cosmetic surgery is a tool to create an ideal sense of self-satisfaction whereby the pains of self-dissatisfaction and selfhatred is eliminated (Mohammd Panah, Ardakan, et al, 2013). Other factors influencing the trend in cosmetic surgery are body social comparison (Kozar, 2009), women social relationships (Beausoleil, 1992), body image, aging and old age, the body of social comparison with peers (Jackson, 1994; Muller, 2010, Chattaraman 2006) (qtd. in Kohi et al, 2012). A research, conducted by Tavasoli and Modaberi (2012) to study women tend to cosmetic surgery in Tehran, shows that the highest women's motivation for carrying out cosmetic surgery are (1) getting more beauty and (2) acquiring self-esteem; the effective factors in this regard are respectively 1. Family 2. Friends 3. Spouse 4. Relatives. 5 family and loved ones. 6 doctors in satellite TV and 7. Cable television. The results of study by Farnham and Levitas (2012) about individuals' motivating for carrying out cosmetic surgery show that low self-esteem, lower lifesatisfaction and increased media exposure enhance the tendency to have cosmetic surgery. Research shows that the unfavorable spread of cosmetic surgery in a community is affected by psychological factors. Personality characteristics influence on individual's strategies to cope with stress in one's life, (Besharat, 2009). Cosmetic surgery is common among all classes of society, especially because of the unbalanced nature of personality traits and general health. The study revealed that obsession and low self-esteem are more in the applicants of rhinoplasty. In addition, other personality patterns are not balanced in these patients (Mas'oudzadeh et al. 2009). There are other influencing factors in the disposition of plastic surgery including defensive style, marital status and educational level of the mother as psychological factors affecting the quality of life and moving toward the perfection (Mohammad Panah Ardakan, 2013).

In terms of defining self-efficacy, learning theorists proposed social and imitation theories against penetration of behaviorism in psychology in the early 1940s. Bandura proposed the idea of human functioning that introduced major roles for cognitive, succession, autonomy and self-reflection processes in adapting and changing human beings. Thus, in social-cognitive view, people are autonomous and active, not reactive, that are controlled by forces or biological environment (gtd. in Shaheni yeylag et al, 2002). In fact, social-cognitive view emphasizes on on human behavior and believes that individuals participate actively in their development and they are able to control events through their behaviors. This perspective refers to the fact that people have personal beliefs that enable them to control their thoughts, feelings, and behaviors. In other words, beliefs and feelings affect human behavior. Therefore, individuals are regarded as both products and environmental generators of their social systems (ibid). According to the concept of mutual determination in Bandura's social cognitive theory (1986), one's level of efficiency both influences and is influenced by situational factors. In this manner, environmental contents may negatively affect individual efficacy by increasing the anxiety of thinking about failure. Bandura (1977) believes that sense of personal efficacy is the most effective elements of in everyday life among various aspects of consciousness. Theory of selfefficacy expectancies suggests that self-efficacy beliefs play predicting or mediatory roles in the patterns of thinking, behavior and motivation. Self-efficacy describes one's beliefs on ability to perform a certain task or specific outcome. These expectations are not relevant to the individual's skills, but they are related to judge what a person can do with whatever skills he possesses (gtd in Mohammad Zadeh, 2010). Distinguishing self efficiency beliefs it self-concept, Shunk defines it as evaluation of individual competence to perform certain behaviors. Researches about self-efficacy beliefs indicate that they influence on the behaviors of academic achievement such as the assignments, persistence, skill acquisition and the amount of effort. Almost all people know the goals they are going to achieve, the issues they are going to change, and the aims they are going to attain. Nevertheless, most people agree that meeting the practical phase of the programs is not easy. Bandura found that one's self-efficacy plays a major role in his approach to the goals, tasks and challenges. People with high sense of self-efficacy look at the challenges as problems that should be overcome. They show more interest in the the activities that they are involved, they are more committed to the interests and activities, and they overcome quickly to sense of desperation (Dehghani, 2013). Strong self-efficacy beliefs have been proposed as a source of power for coping with stressful situations. Much evidence has been reported on the effects of self-efficacy beliefs on blood pressure or heart rate in heart disease (Schwarzer and Fuchs, 1995: qtd. in Hosseini Nasab et al. 2005). Caprara and Steca (2005) show that self-efficacy is significantly and negatively related to anxiety and depression and it is significantly and positively related to life satisfaction, positive affect and optimism. The results showed a significant positive relationship between self-efficacy and psychological



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well being. The explanations for these findings suggest that people with low self-efficacy may exaggerate about the reality of events and incidents that leads to increased stress and anxiety. In addition, high self-efficacy helps in the creation of calm in the face of difficult tasks and activities. In general, self-efficacy beliefs are determining and predicting of a level in which individuals complete a difficult task; hence, self-efficacy becomes a source for happiness (Bahadori Khosroshahi et al, 2012). Findings related to the purpose of study titled as "Determining the relationship between self-efficacy and quality of life after surgery in patients undergoing coronary artery bypass graft," indicate that there is a direct relationship between quality of life and self-efficacy. This means that self-efficacy increases by increasing the quality of life and vice versa (Shafie et al. 2013). Marlo et al demonstrated that self-efficacy is correlated with physical and mental health in patients with rheumatism and arthritis. In other words, patients with low self-efficacy, comparing to patients with high self-efficacy, show physical impairment, fatigue, and pain, and anxious and depressed mood (qtd in Ali Nia Krothi, 2003). Experimental studies have shown that increasing self-efficacy was associated with a decrease in negligence; it predicts negligence even beyond the anxiety.

# **RESEARCH METHOD AND HYPOTHESES**

This causal-comparative study was conducted in fall 1393 in Tehran. The research hypothesis is "whether there is a significant difference in self-efficacy of three groups of people who undergo cosmetic surgery frequently, those undergo once, and people who are not applicants of cosmetic surgery."

# Statistical Population, Statistical Sample and Sampling Method

The study population consists of all people referred to Tehran Sheikh Bahai Surgery Center in fall 1393 for cosmetic surgery. According to the statistics in the center, 733 people have cosmetic surgery done during these three months. With respect to the target population, 50 attempters of cosmetic surgery were referred for the third time or more, 50 attempters for the first time, and 50 relatives of applicants were considered as the control group. Due to a decline in samples (distorted questionnaire, non-return of questionnaires, etc.), each group was reduced to 30. Inclusion criteria for the study subjects was informed consent to participate in research, the absence of mental illness or addiction, and the absence of medical reason (eg, birth defects or physical illness) for cosmetic surgery. Clinical interviews were conducted with participants before the study to ensure the researcher that they do not suffer from mental or certain physical illness. In this regard, a relative was chosen as a member of the control group to match culture and genetic factors. Control subjects were matched with the original sample based on age, sex, marital status, educational level. Selection criteria for the control group were unwillingness to undergo cosmetic surgery, lack of mental illness, and lack of substance abuse; Sherer self-efficacy test was conducted on the samples.

# Research instrument

The researcher uses Sherer self-efficacy questionnaire that has 17 items. Without specifying the factors and phrases, Sherer and Maddux (1982) contend that the scale measures three aspects of behavior including desire to begin behavior, desire to extend the effort to complete the task, and resistance in confrontation with obstacles. This questionnaire has been developed and with 17 questions in Likert 5-scale from completely agree to completely disagree choices for each question. 17 and 85 are the highest score and the lowest score. The method of scoring in Sherer's self-efficacy questionnaire is carried out so that each question is measured from 1 to 5 (1= completely disagree and 5=completely agree). In general, the questionnaire is an interaction among 17 items in which the scored of items 3, 8, 9, 13, and 15 increases from left to right and other scores increase from right to left; a higher score indicates a higher self-efficacy. The obtained scores were correlated with multiple measurements of personality to assess construct validity of self-efficacy scale. The measurements of personality includes Rotter internal-external control scale, subscale of personal control, scale of IE (Lardy & Gurion), social rating scale (Marlow Crowne), and interpersonal competence (Rosenberg) (gtd. In Mogimi Pham, 2000). Cronbach's reliability coefficient alpha obtained



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82%, (according to the Hosseini Nasab, 2005). For criterion validity, internal consistency of this scale was calculated with Rotter's Locus of Control (1966). At significance level of P>0.01, partial correlation of Sherer self-efficacy scale and Rotter internal bench block is r=-0.333 (here, academic achievement has been blocked) and Pearson correlation among the scales is r=0.342. Pearson correlation among these scales was obtained -0.387 by Sherer and Maddux (1982) (qtd. in Handbook of Sherer self-efficacy Questionnaire: Dynamic Test Assistant, 2014).

# Statistical Methods and Data Analysis

The research data were analyzed using descriptive statistics (frequency, percentage, mean and standard deviation), inferential statistics of variance analysis, and post hoc tests; this section represents the results of the analyses. Generally, the data represent facts, concepts or instructions. Analysis is the fundamental step of scientific method of research whereby all research activities are controlled and directed to achieve a result. In other words, the analysis of research results is a method that controls the whole research process from topic selection to results. The majority of research subjects (80 samples) or 88.9 percent were female and 10 samples, or 11.1 percent of subjects were male. 12 respondents to this characteristic had M.A. degree (13.3 percent) 37 respondents had B.A. degree (41.1) percent), 6 respondents had Associate degree (6.7 percent), 32 respondents had Diploma degree (35.6 percent), and 3 respondents had lower degrees than Diploma (3.3 percent). 7 respondents had less than 20 years old (7.8 percent), 15 samples were between 21 to 25 (16.7 percent), 20 subjects were between 26 to 30 (22.2 percent), and 48 persons had more than 30 years old (53.3). 54.4 percent of samples were single and 45.6 percent were married.

# **Testing the Hypotheses**

First, descriptive statistical characteristics of the sample group are presented in Table 1. This table shows the minimum, maximum, mean and standard deviation of factors and sub-factors of the research.

# **Evaluation of Data Normality**

After data collection, the nature of research quantitative data distribution should be regarded in terms of normality and non-normality. The prerequisite for application of parametric and nonparametric tests is data status test in this respect. Following this assumption, Kolmogorov-Smirnov test was used to identify the normal distribution of research data. It uncovers whether researcher should use parametric test or nonparametric test to examine the hypothesis. The results of this test showed that Z-value for the variable self-efficacy is not significant at error level of below 0.05. In other words, the distribution of data in these variables is normal. However, it is necessary for data distribution to be normal or near normal. As self-efficacy follows a normal distribution according to Table 2, parametric analysis is appropriate to perform analysis of variance. Table 3 represents descriptive indicators of the three groups in self-efficacy. Based on the above table, one can compare the visual differences between the mean scores of self-efficacy in people who have frequently attempted to cosmetic surgery (24.60), people who have attempted cosmetic surgery for the first time (2787), and people who have never attempted cosmetic surgery (76.47). The scores indicate big differences in the mean values. Since the F-statistics value (2.737) and significance level are higher than 0.05, the variance of group error is identical and there is no reason for heterogeneity of variances. Table 5 represents the results of variance analysis on self-efficacy scores in the three groups. The results indicate that there are significant differences among subjects of three groups. With respect to the values of F=550.559 and  $\alpha$ = 0.001), the separate effects of subjects type on self- efficacy are significant; it means that there is a statistical difference among the scores of self-efficacy in three groups. Table 6 shows the multiple comparison of mean difference for scores of selfefficacy among three groups. The above table shows the results of Tukey test; due to significance of variance analysis, it describes difference among the groups. The mean of scores of self-efficacy for subjects who have not applied for cosmetic surgery and subjects who attempted the surgery once is significant at error level below 0.01. In addition, the mean of scores of self-efficacy for subjects who have not applied for cosmetic surgery and subjects who attempted the



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surgery three times or more is significant at error level below 0.01. To sit that, there is a difference between subjects who have never applied for cosmetic surgery and subjects who have applied once, or have applied three times or more in terms of self-efficiency. However, there is no difference at significance level below 0.05 between subjects attempt cosmetic surgery once and subjects attempt it three times or more.

# CONCLUSION

The results showed that the number of women using cosmetic surgery is more than men (women 8 times more than men). This may indicate that profound changes in appearance is more acceptable for women rather than men; indeed, the same amount of attention to a woman's appearance, and considered to be well dressed, is regarded as manly narcissistic sense. Many studies emphasize on the significant relationship between gender and desire for cosmetic surgery so that women form the largest percentage of clients for cosmetic surgery in most reports (Napoleon, 1989, Pavan 2008, Kavalm 2006). More than half of the participants in this research were college students and educated people; this is consistent with Hosseini et al (2010), Bobchechov et al (2003), and Qaleh Bandi and Afkham (2004). Moreover, Tousi (2007) the level of education is one of the factors motivating and influencing tendency to cosmetic surgery because educated people are usually perfectionist and associated with persons with higher classes in social interactions. Thus, they are more sensitive to their appearances; they may choose cosmetic surgery to gain social prestige and better appearance. Contrary to the study conducted by Qaleh Bandi and Afkham (2004), Masoud Zadeh et al (2009) and Totoonchi et al (2007), most of the subjects have more than 25 years old. In this research, 54% of participants were single that is consistent with Bobchechov et al (2003). The results revealed that there are significant differences of self-efficacy among three groups of control, subjects who try cosmetic surgery for the first time, and subjects who try cosmetic surgery for third time or more. Both applicants' groups acquire less selfefficacy scores. Strong self-efficacy beliefs plays predicting and mediating role in patterns of thought, behavior and motivation (Bandura, 1977). Francis (1999) found that people with high self-efficacy have better understanding of their mental characteristics, are more comfortable in communicating with others, can easily control their negative emotions, and have greater satisfaction in their lives. High self-efficacy increases mental health of individuals because they are convinced about their competence and can succeed at work; in turn, this leads to increased levels of maturity, independence and self-esteem. The results are in accordance with lether (2002), Francis (1999), Penterich and Di-Grout (1990), Zimmerman (1995), Dishman 2005), and Seif (2008). Low self-efficacy results in low predicting success and shame (Jennings & Abrow, 2004), interferes with a person's ability (Boyd, 2005), increases stress and anxiety (Zimmerman, 1995); it nurtures conditions with negative thoughts like doubting or blaming oneself, which causes passivness and the fear of failure (Davari, 2012).

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Table 1. Descriptive statistical characteristics of the sample group

Factors	Min.	Max.	Mean	S.D.
Self-efficacy	18	85	42.98	24.775

Table 2. Results of variable normality

Variable	Mean	Standard deviation	Kolmogorov- Smirnov value	Z- value	Sig.	Result
self-efficacy	42.98	24.775	0.127	0.697	0.716	Normal



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# Table 3. Descriptive indicators of the three groups in self-efficacy

Indicator Groups	Number	Min.	Max.	Mean	S.D.
Control group	30	65	85	76.47	6.118
Once surgery	30	18	42	27.87	7.995
Three or more surgeries	30	18	41	24.60	6.049

# Table 4. Equality of error variances

F-statistics value	Freedom degree 1	Freedom degree 2	Significance level of P
2.737	2	87	0.070

Table 5. The results of variance analysis on self-efficacy scores in the three groups

Indicator  Variables	Sum of squares	D.F.	Mean of Squares	F-statistics	Sig. level
Between groups	50627.822	2	25313.911	550.559	0.001
Within groups	4000.1333	87	45.979		
Total amount	54627.956	89			

# Table 6. Comparison of mean difference for scores of self-efficacy among three groups

Indicator Groups		Mean difference	Standard error	Significance level
	Once surgery	-48.600	1.751	0.001
Control group	Three or more surgeries	-51.861	1.751	0.001
Once apply	Three or more surgeries	-3.267	1.751	0.155



# **RESEARCH ARTICLE**

# Symbols and Signs of Ancient Iran and Contemporary Graphics

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# **ABSTRACT**

Iranian contemporary art, regardless of the formalist attitude, totally, has been well represented a concept called "Ecological perspective in real world". This concept is consistent with post-modernistic patterns and its main slogan means "Act Locally". The mentioned characteristic andunderstanding the time and location help to take advantage of such an approach. In Iranian contemporary art, "identity", not only represent the nostalgic picture of historical past, but also produce new forms, asymmetric, with the backing of a single unique and non-recurring concept.

Identity look is subjected to two points and: Firs, the artist himself is familiar with tools, new media and high technology and some concepts; such as acceptance others idea and proliferation- Also, he concern within thoughts about "who is he". The second station include the society and social position in which the artist live the life and produce its image.

Key words: Iran contemporary Art, Iran AncientCulture. Identity, Formalist

# INTRODUCTION

A glimpse on Iran ancient art show ancient times designs originated in rituals, beliefs,...in which for centuries has maintained its.

Unique features. If turning to the past and taking what is compatible in today culture and environment is conducted in accordance with the principles, then a huge collection of unknown works in Iran and culture and civilization



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become apparent, not only effective in strengthening indigenous art, but also it meets today's art world needs, and even, it is hoped, it can be expanded among nations.

#### General overview

One of the most important issues in the graphics world deals with the relationship between the designer and two fundamental elements: the past and pictorial tradition. This relationship is, generally, discussed in the context of our graphical identity. When one talks about the Iranian graphic, everything is figure not nature and/or point of view. It is important. It is just related to cultural and personal graphic area. Most of our graphic designers are, more or less, challenged with pictorial traditions. The more we turn back, the more challenge we would have with motifs and graphic lithography. In recent years, our designers deal with Persian calligraphy or printed Persian types. Throughout the history of our contemporary graphic we have touched the illustration of lithography, miniatures and calligraphy. Apparently, there is relationship between us and the past. But whether we would continue the past or not is another story. Here there is an important issue and it means using the last or continuing it. Does use the video script is the same relationship or continue the past?

In connecting with our culture and people, graphics work should continue the past or evolved continue of past. An in the past, our people didn't feel alienated on the picture of Iranian culture, this closeness should occur naturally. If this closeness occurs, so we should have a modern but native graphic. Whether western works seem or works created with past pictorial factors and Iranian one, none of them has real relationship with Iranian current culture a and people, as an un-coordinate and complex. The works done by means of our past pictorial factors communicatively are strange as same as western appearance works, such as our graphic look is a western one.

# The issue necessity and importance

At the first glance, what depict Iran contemporary graphic vulnerable is due to the following:

- 1-Transient look toward contemporary graphic designs show the graphists paid attention to Iran art certain period and the most designs are adapted from a certain time span.
- 2- Another damagerelates to the sole formalistic approach toward designs

### **Objectives**

Today, all countries are trying to introduce their cultural symbols correctly. In the contemporary era, graphic not only is limited to commercial would, but also designing is depicted for some ceremonies such as Olympic plays have been converted into the principle main issue of the host country such that sociologists, artists,... try to provide strategies to create the best symbol. Such that observing this symbol one can remember the most important event of that era.

# The main question

What ways can be used to reinforce contemporary graphic. Without blind limitation of past?

Do need the influence of contemporary graphic on the logo and signs of ancient motifs?

### The scope and focus



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This study time frame in ancient era is median time to Sasanian and cotemporary Iran in today Iran.

### **Hypothesizes**

It is necessary to influence in contemporary graphic design logo and signs from ancient designs

Graphic arts have the major contribution in keeping the art and culture of Iranian

There are strategies to reinforce Iran contemporary graphic in the logos and signs Mythologythe research methodology is descriptive, analytical and historical.

# Symbol, Icon, Index: sign

### Semiology

From 1950 ownward, semiotics methods, especially in 2 knowledge domains of recognizing the implication and constructive perception of communication system has been applied. Along with the development of structural methods, in,many science fields and philosophy, semiology has been taken into consideration. In this regard, thinker's literatures such as levistrauss (in the field of anthropology, ethnolohy, sociology and Freud's theories of the evolution)

And Roland Barthes (aesthetic theories) paid close attention to the impact of aesthetics and art theories. In this regard, Barthes role is more impressive, Along with Barthes role is more impressive. Along with Barthes, some impressive thinkers such as TezotanTeodro, Julia Kristeva, Gerard Genette, Umberto Eco, cloudeBermun, AlgirdasJulienGreimas, some important literatures, in the field of literary theory and aesthetics, were offered. The scholars were inspired by Russian Formalists.

In 1920, in Sovietunion, formalist introduced impressive works about literature and cinema.

And the customs established in literary criticism were forcibly disappeared by Stalinism criticism.

In 1964, Roland Barthes, in a treatise, explained theoretical concept of semiotics. In addition, a chapter of the "Missing structure" by Umberto Eco deals with "visual signals" certainly one can say the discussion theoretical basis regarding to visual semiotics have been shaped in the last two decades. It should be noted, concurrent with the formation of these topics. Some criticism about the most important bases of semiotics was beginning by another school thinker. Among these, one should take some modern hermeneutics authors and janDerrida's critique.

Derrida's thought made Derrida to found "post-structuralism" school called "Deconstruction". (Chandler, 1387: 32).

# Scientific semiotics

Scientific semiotics is regarded as a science declares its goal in recognizing and analyzing the signs and icons, whether spoken- written language or un-lingualistic one including physiologic, biologic, meaning systems, value systems, iconic symbols, different worldviews and even all the form of mobility, status conscious or unconscious position, tactical,..." (Rnhaym, 1388:299).



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Although semiotics has a long life, and there is no theory once formed, but methodologies researchers believe it generally originated in ferdin and dos sur and Charles pierce approach.

The first considers the more technical and linguistic aspect of this approach, and the latter has a more flexible approach. Actually, both establish a new connection between knowledge and signs (smith, 1385:8)

Generally, the purpose of semiotics is to study symbolic system such as languages, symbols, emblems, signs symptoms, etc.

Semiotics is regarded as one the most important methods which plays an important role in creating the meaning. In this regard RolanBarthe believes it deal with" significance process" (Brvsys,1387:153)

# Symbol, Icon, Index

Symbol is a sign both there is no similarity between form and concept and neighboring relations. But there is contractual relationship not innate and is called spontaneous of symbolic signs in non-icons symptoms, natural signs and contractual and conditional cues (Hohenhgra, 1373:202)

It is easy to interpret signs and symbols, because the are inspired from reality and are a picture of reality, but icons are different (Ghahremani, 1392:198). On the other hand, all the genres and media and communicative forms are subjected to the certain codes one can reach communicative purposes with recognizing and analyzing symbolic respect, correctly. But, if these symbols are decodified correctly, it cause misunderstanding (Pardis, 1389:54)

### Signs from Ferdinand de Saussure view

"Ferdinand de Saussure" as linguistics father was among the pioneers of semiotics. Saussure regards it as phenomena formed form the combination of signifier and signified.

Saussure's thoughts in linguistics and lingual signs relayed on dichotomies such as signifier and signified, substitution and companion Saussure tried to exclude linguistics include:

Distinction between descriptive and historical study, distinction between substitution and companion and value systems contemporary semiotics is a heritage of Saussure with moving from Russian formalist Prague and RolanBarthe to some extent.

Live Astrvaswas regarded semiotics as a method to find the hidden logic which manifest behind the social functions (Mora, 1383:302)

# Pearce and semiotics

For the first time, the term "sign" and consequently various kind of signs including symbol divided into 3 sings was entered modern literature by Charles sanders peirce (1839-1914)

Pierce regard sign nothing but logic in the broad sense. Sign reaches meaning with abstraction void of mind which can be different on the basis of mind always can be different on the basis of mind always with hard-mounted action (shovalia 1384:301)



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Signal processing requires 3 fundamental elements: interpretation, sign and meaning- signal processing connect the signs with meaning. In this regard sign "is something someone regards it as an unternative for something else. As a result, one can see pierces semiotics theory is based on the actions. And trichotomy relation of elements and can't be reduced into two-fold relation of "unlike Saussura's model of sign... pierce introduced a tichotomy pattern:

Representing the form sign takes, 2- interpreting not interpreter, but the meaning obtained from sign, 3- object in which sign refers to it (Sojodi, 1387: 27)

### Pierce trichotomy signs

Pierce divided "signs" into three famous categories: icon, index, and symbol (Hall, 1380:137). It studies symbol with cognitive association approach as a medium in message transmission, and reject mere philosophical and linguistic aspects.

What close pierce and his semiotics theories into Bareth idea manifest in re explaining pierce approaches in relation to art history. And this point show pierce theory end in referring a thing in which we should think about art process aspect in the society. According to pierce "once sign is regarded as sign which can transmit into another sign which can give it vigor", (Warner,1386:215).

# Persian design and symbols

The most important symbols in human life can be touched in language domain as a culture reflector. In this regard, human acts in symbol frame work, as defined visual signs which reflect human behavior and emotion. In the other word, human use symbol to show his/her inner expectations. Actually, symbols show dramatic relations direct our behaviors and goals simply.

Generally, symbols are two kinds: symbols are contractual relationship and/or institutionalized relationship which get common gradually.

Both introduce symbols and relationships in a small, emotional, visual, metaphorical, allusive and vocal format (Mousavinia, 1388:75)

# **Pre-historic Designs**

One of the most important features of ancient desigs can be referred as their mere simplicity indicating they were not the result of creators ill-skill and inexperience, but they originate from their worldview and thinking manner toward daily affairs Regarding to the interpretation these designs, in attention to personal deduction and interpretations of human nature and environment. Design multiplicity manifest ancient human interpretations and these designs development is various from time to time (Pardis 1389:145)

### Iranian cotemporary Graphic

### In connection with the past

During the hundered years in which we have had on global relation, most encounters have changed toward the world, our house, food, education, our communication with each other, family, relations, partner, children have changed dramatically. Meanwhile such changes are not the same and based on time and place follow independent



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paths. Our relation with the past is semi-cut and with contemporary era is discontinuous and uncertain. There is no doubt our view toward the tradition is undecided and formalistic one having real distance from other components of the society.

Finally one can conclude it can't carry the past and follow the past nature.

Thus, our encounter toward imagery customs is formalistic one and withdrawal from the past not connected one.

Our view and this view structure and what it see and choose and our intimacy toward these components which approve our Iranian ability it is not very simple and optional. So, the questions are: in our unconscious perspective what remain from the past? Our relations and what exist in our mental perspective, How much is close and intimate? At first, our relation with the past should be intimate and clear, It helps us to reflect its factor in our intimate relations. Of course, our today formalistic tendency, by means of our past pictorial tradition, provide the innovation possibility and our western interface view and past pictorial texture in some places, restrict.

In some cases, of today active graphists, I have seen interesting samples of intimate application of past pictorial factors, samples which relate me with something ambiguous but familiar. But, generally, there is fundamental discontinuity among our past and graphic and today reality

In kait, I can say Graphic has Iranian origin, which can communicate with Iranian people and culture, not the one executives foreign visitors call it Iranian graphic.

An art without Iranian origin and can not communicate to some levels of the society is simple and stranger without importance what pictorial factors have been used (Mesghali, 1388:10)

Since graphic depicts how to live the modern life, also, it is loyal with modern life soul. So, one can see it both from inside and outside, living life method in a geographical point without boundary, a free and mere one. And in a wide levels of culture is called "interlinking". Interlinking define as aggregation of our various experiences interactions, from today life with all its hidden tensions, with all the things from the history forces gathered them in a single place. At first glance, graphic reports this human experience tries to arrange it and establish inner order.

Such as its people, graphic is multi-pieces, it doesn't speak about an independent identity but tries to introduce it in an integrated identity.

In a graphic masterpiece there are various layers in consumable layer there is media and communicative requirements. This layer has expire date, but in idea, authoring and aesthetic layers, each graphic work is

Culture maker and representative of each society visual civilization. Even after their expire time these layers represent reliable criterions. One of these criterions is innovation in speech and character existence, views and thoughts in artist geographical and cultural bed, which is apparent in all his/her masterpieces. Apart from the identity in graphic art, one should pay close attention into "nature". Sometimes there are some works in Iranian art, with Iranian identity and without Iranian nature. Firsty, an artist should seek, visual value and Iranian signs, and move toward this trend, as a rule, internationalizing an identity depend on some factors including designer character, believing rules and roots, and designer expectations. As long as all the factors are not included, moving toward globalization are not verified. To move toward globalization of Iranian art, one should recognize the roots and natures (mesghali, 1388, 11).



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### Iranian thought

In this regard Ghobadshiva, Iranian famous graphist, write: "when someone decides to not affect any graphics in the world and tries to create a work from his/her unconsciousness naturally, nothing emit from it, except something emit from your unconsciousness. When an actor is a good one that play different role. If a designer wants to talk the world, he/she should talk in his/her own language. It I talk in polish, I'm a polish. If I tries to exploit Japon graphic codes, and speak in Japonese. I would a Japanese. So, we should think about ourself. As an intelligent, we should be sensitive toward our society problems we should be sensitive in the relation to culture, poem, music, civilization, audit and geography and our nature if we touch our culture well, this sensitivity convey into our work, and andience feels sth close to himself. We should speak in our Iranian language, but unfortunaty, today, the wrong one have become common. They think if they added on Iranian motif in a work.

Their work became Iranian one. I never believe in it-finally, we have a root and feed from it so. It is necessary to follow it and find it again.

When in the routh of artistic creation you take influenced from yourself, you as your mirror, some norms enter their step into your way and tour thinking color would be as same as your work (Kasai, 1385:16). In the modern era, due to the nature and expansion of social life, plurality of action platforms and diversity in authorities, lifestyle choice play an important role in forming identity and daily activities, such that reflective pattern of life considers the risks of expertise and convert into the central part of making the personality. These events play an important role in making identity and act as a guide for artist and help them to create a masterpiece. Undoubtedly, by exploring and studying the historical and aesthetic past of Iran one can find many paintings and elements which show Iranian identity and convert into different and modern and different design with Iranian flavor by means of creative thinking to show Iranian identity in a new format (Kasai, 1385:17).

# Contemporary graphic motivation

In Iran contemporary graphic, as complex collection of tastes and trends, techniques act traditional and mello, at first sight, its elements are not visible. This problem has no direct relation to apply this traditional motifs or imitate the obsolete methods and practicas. The elements which show these products should manifest naturally. One can't get the real result by means of force, imitation, unsystemic and ongoing grete taking According to sahabi, a considerable part of art or graphic include two characteristic: speed and time limitation of the most graphic products. Which remain no place reflection and meditation on identity and etc. the main motivation of this domain is to faster and lighter communicate, more speech, the more sale which everything else is unimportant. Along with the motivation and acceleration time

And conceptual brifness, discussion about identity, despite of its complexity and ambiguity, has no real position. The second characteristic of natural and logical orientation of graphic is to give everyone real understanding and a tendancy which may be the main characteristic of this technique: inclusion and globalization.

This tendancy can be found in all the graphic products including logo design, poster,... (Hosseini, 1391:12)

# Iran contemporary graphic on the west

One of the most sensitive parts of Iranian graphy study refers to its relation with west graphic. The relationship of love and hate in this statement has no relation with its pre and after statements. Today, graphic is the result of west development for collective communications. When a new phenomena is created in Iran namely printed book, brand, advertisement, poster, without imitation the west. Our graphic culture is constantly sampling the west culture is



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constantly sampling the west culture. Actually, imitation or sampling these happen in all the visual art areas. Our arlistic direction with our society and universe has no organic and continual relation, but it is a reflection what happen in the west. We interest in three's fruit not the three. How to irrigate the threes, in what land, weather, climate, fertilizer, season soon are far from our thinking circle. We only consider its fruit in to consideration.

Visual arts of west are the reflection of social, political and cultural condition of its era. One can see the west historical route in era. One can see the west historical route in arts and generally in the visual arts (Mesghali, 1388;11)

Classics, Romanticism, Impressionism, Expressionism, cubism, Abstract and contextual art each manifest one period of west history and relate to each period philosophy. The next is located on the previous back or a reflection toward the previous. The nature of each west artistic phenomena is associated with west nature of the previous era. When in the 19th centary, western industrial man was separated and isolated from the tribe and plural society, it is individuality was born. Then individual romantism his/her sesations and thoughts, and beliefs was manifested as senses show in Impressionists and, then, expressionists. Picasso is a manifestation of a human lost his balance and he is regarded the loud voice of anti-aesthetics. Abstract represent human cutting his mental relationship with the outside world, submerged in his/her unconsciousness, decades before, freud identified and defined it. Contextual artist manifests the human not only denies his/her beauty, but also denies artistic forms structure.

Is this no the right time to relate complete deny of traditional, tribal, family and dispersal from everything into the west? A discrete human without real comparison and assay to Judge and legislator, Judge and rulers are an abstraction of his/her Judgement. He/she is the sole Judge. He knows his ability and allow himself to decide in an aesthetic subject freely. When marcel Duchamp suggested an catchment can be an artistic object and exhibited it in his gallery, is negation of meaning and generally common meaning exist in his ventricle? Is the beginning to feel and mean deny every thing originate from the mind itself? (Mesghali, 1388:12).

The west graphic, also, has its step by step evolution Each west graphic era has a refection toward the past and society requirement the society components and west culture have organic relationship. Each part has direct or indirect effect on the other part. All the parts have cause and effect relationship

When Iranian cultural posters are placed in front of the similar foreign cultural posters, western posters are in line with west culture and west reflection and continue the west culture and woven in the west culture and when one look at these masterpieces, as if he/she touch the west.

But there is relationship between us and our posters, because it is not relate to the society and its origin. It is no to the fact its components is Iranian one, but our posters has no Iranian (eastern) nature. Iranian works include a simple crust

Graphic design are mentioned as "problem solution" generally in our contemporary era is formalistic one without communicative aim and such as personal expression tool and aestethics. In sixties and seventies decades in the west art world, the buds of post-modernistic and deconstructing ideas and opposition to the accepted structures was sprouted. After nineties decades, one of the interesting topics young designevs was western graphic.

In that period, fundamental theories of designing the graphic and relational affair and promotional graphic were formed and regarded as the basic rule. Deconstructing theories teansgressed against a comprehensive structure in the west. One of the deconstruction pioneers tells: the rule and principle is to deconstruction, but, at first, it is necessary to know the principle (Mesghali, 1388:14)



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### Applying Iranian Design in Graphic

If the relative success of the introduced symptoms is to refer to the local culture, improper handling of this of these symptoms lead to adverse consequences and cause non- Iranian symbols. On the other hand, non-standard applications cause designs which introduce this clime culture, convert into decorative elements, and gradually lose its identity. In the following one can experience the special condition ruled on environmental graphic of Tehran, including the abuse of designs. Using the computer tricks, mismatch between image and design and to select jobs unrelated to the design and to use.

Forest to cow is regarded as a role of a traditional restaurant. This role mean the beginning of a new season and a syptom of spring (Smith, 1385:125).

Of course, the frequent use of these designs cause more familiarity to their cultural past, but after a period, these design convert into the thousands un-identity and conceptual image, applying during the last years and after a whale, it give its place to the other designs. Applying the above mentioned designs and motifs in urban elements cause a real familiarity with culture belonging to a nation and neglect the semantics and sole attention to exterior beauty of the designs. It seems there is the simpler solutions for this problem (Ghahremani, 1392:25)

# CONCLUSION

At first glance what show. Iranian symbol design vulnearable, is caused by:

A quick look at the designed symbols shows graphists always pay attention to a specific era of Iran art. And most designed symbols have been derived from a certain timeframe.

Although it is not reprehensible and artists are free in their selection. So, it caused various designs exist from other historical eras forgotten. As a result, in creating connective bridge between graphic and society, only a part of it have been transferred into the design and other designs have been forgotten.

Another damage regarded as a real risk, is sole formalistic procedure toward designs this is not real problem. But what is disappointing is to induct the concepts and beliefs which not only isn't compatible with the spirit of designs, but also it cause a spurious and un correct meaning to the audience. In the following there are considerable symbols designed on the basis of pre-Islamic designs.

Finally, said that if the designers can get an original language relying on Iranian rich culture and art, which show Iranian identity applying it in a proper manner. It can create ait in a proper manner. It can create a suitable bed of social concept and delivering them to the audiences. So, they can be success in their theoretical social and practical structure of course, it need real attempt, public system in cultural aspects which understand and recognize thinking possibility, creativity of graphic art and can evaluate emotional ability of artists toward building a wealthy society based on social and ortistic roles- And, Iran graphic whould reach a shared and common idea with collective and individual attempts.

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# **RESEARCH ARTICLE**

# Effect of Conservatism on Capital Costs in the Pharmaceutical-Chemical Companies Listed in Tehran Stock Exchange

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# **ABSTRACT**

The main purpose of this study is to investigate the effect of conservatism on capital costs in the pharmaceutical-chemical companies listed in Tehran Stock Exchange during 1388 to 1392. In this regard, accounting conservatism (conditional and unconditional conservativeness) is the independent variables and the cost of capital is regarded as the dependent variable. Firm size and financial leverage are control variables. Statistical population of research is companies listed in Tehran Stock Exchange and sample size contains 23 companies. In the theoretical part, the data are collected through library base methods; in terms of hypothesis, testing, financial statements are analyzed as the documents. In general, multiple regression is used in this study. The hypotheses are tested using the results of econometric models and multivariate regression. The results show that the conditional and unconditional conservatism have direct impacts on the cost of capital in Tehran Stock Exchange. The results of the control variables indicate that conditional and unconditional conservatism has direct and significant impact on the financial leverage and firm size.

**Key words**: Conditional conservatism, unconditional conservatism, cost of capital, financial leverage.

# INTRODUCTION

In Tehran Stock Exchange, companies are obliged to provide information about their performance for investors and financial analysts through Tehran Stock Exchange. The information provided for investors, financial analysts and decision-makers in financial reports should be useful and the most relevant information.



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Previous studies show that the cost of capital affects stock prices, liquidity of stock market, and analysts' prediction (Brockman & Cicone, 2008). These results suggest that offered capital costs by companies have had information content and efficiency; thus, the cost of capital is more pronounced due to the role and influence on decisions of users, particularly investors (Kurdistan et al., 2008).

Conservatism accelerates the identification of adverse news related to income, increases the reliability of reported earnings, and reduces the information asymmetry. In identification of profit and loss, accountants prefer higher degree of the good news (profit) verification rather than greater degree of bad news (loss) verification. Accordingly, conservatism is created due to asymmetry in the verification of profit and loss account. Furthermore, conservatism is known as differential verification of profit identification against loss. This expression emphasizes on the degree of profit verification versus loss verification. Differential verification of profit versus loss results in asymmetry in the recognition of profit and loss, or applying conservatism, causes lower expression of net asset comparing to actual amount. In this manner, reporting lower net asset comparing to real cost brings about increase profits in later periods (Wattes & Chen, 2011).

Given the importance and necessity of discussing conservatism and capital cost information in decision-making management, this research studies investigate the effect of conservatism on capital costs in the pharmaceutical-chemical companies listed in Tehran Stock Exchange.

# Research hypotheses

### The main hypothesis

Conservatism has a significant impact on the cost of capital.

### Secondary hypotheses

Conditional conservatism has a significant impact on the cost of capital.

Unconditional conservatism has a significant impact on the cost of capital.

# Statistical population and statistical sample

The target population contains pharmaceutical-chemical companies listed in Tehran Stock Exchange during 1388 to 1392; all companies are included in this research. The intended hypotheses are tested for the companies. The following limitations are considered for the samples. In other words, the samples are selected from all companies due to the following conditions:

For a homogeneous sample-selection, pharmaceutical and chemical industry companies should have been listed in Tehran Stock Exchange prior to 1388 and the shares should have been traded on the stock exchange from the beginning of 1388.

For selection of active pharmaceutical and chemical companies, the company's deals should not be interrupted in stock during the period 1388 to 1392.

They should not change their activities or fiscal year between the years 1388 to 1392.



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Given the above conditions applying and sampling methods, 23 companies were selected as test samples from all pharmaceutical-chemical companies listed in Tehran Stock Exchange for the period of 5 years from 1388 to 1392.

#### **Theoretical Foundations**

Having been responsible for preparing the financial statements, with full awareness of the company's financial status, and with a greater awareness compared the users of the financial statements, managers are trying potentially to portray a favorable image of a business entity. In such circumstances, accounting principles and procedures employ the term 'conservatism' with the support of accounting standard setting bodies, aiming to balance managers' optimism, protect the rights of beneficiaries, and provide fair presentation of financial statements. Conservatism is a concept with long history in accounting and some have tried to bring it to the realm of theory. Jet Field believes that conservatism is rooted in the Middle Ages. The concept of conservatism was created when the balance sheet was the most important and often the only financial form; components of earnings or other results of operations rarely offered outside the company.

According to Basu, the influence of conservatism on accounting practices has at least 500 years old. Sterling knows conservatism as the most influential assessing principle in accounting (Watts, 2009). Recently, the concept of conservatism (biased recognition) has been divided into two sub-themes: conditional and unconditional conservatism (Beaver and Ryan, 2005; Ball and Shiva Kumar, 2005). Some studies, such as the Pope and Volker (2003), are classified the two groups respectively as conservatism after the event (after the news) and before the event (before the news) (Ahmad et al., 2011). Unconditional conservatism is actually understating stable net asset, which is independent of the news. Conservatism means that penalty for disclosure is higher than penalty for non-disclosure.

# LITERATURE REVIEW

In a research titled "Big auditors, private firms and accounting conservatism: Spanish evidence," Catch (2013) found that despite the penalties arising from misleading reporting, managers of companies with financial crisis have strong motivation to release optimistic earnings forecasts because the company, or their position in the company, may not take enough that they face fines of incorrect reporting.

Clement and others (2014) examined the relationship between news release about predicting benefits by managers and stock price changes; they concluded that this release is effective in distribution of financial analysts forecast in addition to influencing the price of the shares.

Amiri (2010) states that the results of testing his hypotheses indicate a reverse significant relationship between managerial ownership and conservatism. These results suggest that managers' participation in the ownership of the company, reduces demand for conservative accounting.

In a research titled "factors affecting conservative accounting practices," Dariush Foroei and Javad Abbasi (2011) studied the relationship between conservatism and a number of features, including size, ratio of market value to book value of equity (MB), the degree of financial leverage, life and cycle of enterprise investment and uncertainty. The results indicate that there is a negative and significant relationship between conservatism and firm size with respect to used Khan and Watts's regression model.

Younes Bad Avar Nahandi and Mohsen Hasani (2011) evaluated the measure of conservatism in financial reporting for listed companies in Tehran Stock Exchange. This investigation contains the observance of conditional conservative measures for 80 listed companies in Tehran Stock Exchange during 1381 to 1388. Using Ball and Shiva



## show that the target companies did not observe the intended measures for cor

Kumar model (2005), they show that the target companies did not observe the intended measures for conditional conservatism. To say that, the sample companies identify economic benefits quickly, but they postpone the identification of economic losses. It indicates the employment of daring methods of accounting in non-bankrupt companies; it reveals that the reporting status of non-bankrupt companies is not favorable.

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Omid Pour Heidari and Abbas Ghafarloo (2012) studied the effect of conservatism (conditional or unconditional) on the cost of capital in their title "Conditional and unconditional conservatism accounting effect on the cost of ownership rights." The results showed that there is a reverse significant relationship between conditional conservatism and the cost of capital and there is no clear relationship between unconditional conservatism and no capital cost of a company.

In "Conditional conservatism impact on the reliability and timeliness of information disclosure," Mohammad Reza Nikbakht (2012) used Khan and Watts' measure of conservatism to evaluate the conservatism of Cullen et al. In this study, conditional conservatism and increasing the quality of disclosure are used as two successor information politics. Results from this study indicate that conditional conservative practice reduces the reliability of information disclosed by companies, increases volatility in the forecast, and causes their difference with real values.

### RESEARCH METHOD

To gather the required information and the theoretical background of the study, library based methods were used including a review of available texts, theses, articles, Persian and English specialized books, and websites.

The required data and financial information is obtained from the analysis of documents provided by the Tehran Stock Exchange. This information is provided by referring to companies' financial statements and accompanying explanatory notes.

Financial information of listed companies was gathered by Rahavard Novin software. The published CDs by "Public Relations Unit of the Stock Exchange" were used for achieving financial statements and explanatory notes. Finally, EVIWES software was used to analyze the data and to achieve reliable results.

### Research Model

In the research, conditional and unconditional accounting conservatism are the independent variables and the cost of capital is regarded as the dependent variable; financial leverage and firm size are the control variables.

This model is offered in the following manner. All variables are calculated annually:

1)
$$CCON = b_0 + b_1CP + b_2LEV + b_3SIZE + \varepsilon$$

2)
$$UNCCON = b_0 + b_1CP + b_2LEV + b_3SIZE + \varepsilon$$

Where:

CCON: conditional conservatism.

UNCCON: unconditional conservatism.



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LEV: Financial Leverage

SIZE: firm size

e: error of Estimation

b: intercept of the regression

b<sub>1</sub> to b<sub>3</sub>: the coefficients of the independent variables

### Research Variable

### Conditional conservatism

This is after event conservatism that is called news dependent conservatism. It refers to a more timely recognition of bad news compared to good news on earnings. For instance, the principle of least cost or market value, elimination of goodwill due to the devaluation test, and identification of possible asymmetric potential losses against profits. Conservatism is different verification necessary to identify income and expenses that leads to the understatement of profits and assets; this definition implies conditional conservatism (Khanlari, 2010).

### **Conditional Conservatism Measurement Methods**

This is a method based on the negative correlation coefficient of change in operating profit compared to negative changes in the positive changes (this criterion was used by Basu Shyakomer and Radak). To make this a reality, the regression model (1) can be estimated as follows (Basu, 1997):

In model (1):

•  $\mathbf{M}_{\mathbf{t}}$ : Change in operating profit for the year t homogenized by the first market value of capital

 $DOI_{t-1}$ : equals to 1 when  $\circ$   $OI_{t}$  is negative unless it is zero.

 ${\it CON}_{1 \cdots}$ : The first measure of conservatism in year t.

Since there is a tendency for good news to be identified during several periods, it is expected that positive changes in profit is repeated compared to negative changes in profit. Hence, negative correlation coefficient between  $D0I_{t-1}$  and  $00I_{t-1}$  and one conservative reporting is constant. Negative coefficient is also used to ensure that the criterion increase with conservative accounting.



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### Unconditional conservatism

Another type of conservatism is conservatism after the event that is called conservatism independent of the news or unconditional conservatism. Before event .conservatism is resulted from the usage of such standards reducing profits independent of current economic news. For instance, immediate identification of advertising, research and development expenses as costs (Basu, 1997).

### **Unconditional Conservatism Measurement Methods**

Gully et al (2007) used non-operational accruals (optional) to measure conservatism with on a specific definition. According to this definition, conservatism applied to identification and reporting financial events when, first, the managers are challenging with ambiguity and uncertainty leading to selection of one item among several items; second, a method is selected and implemented based on the results in the least possible retained earnings. They used discretionary (non-operational) accruals because accrual accounting is a conduit for applying conservatism; in addition, implementation of authority by managers paves the way for conservatism in the absence of certainty. Moreover, with the omployment of this standard, one accepts that level of uncertainty associated with items that are not part of company's routine and continuous operations is higher than level of uncertainty in terms of items that are regarded as regular activities of the company (Ball and et al, 2001).

Total accruals and discretionary accruals (non-operational) is calculated this way:

### Formula 2:

ACC it = (NA it + DEP it) - CFO it

OACC it = 
$$\Delta$$
 ( AR it + I it + P it ) -  $\Delta$  (AP it + TP it)

NOACC it = ACC it - OACC it

NOACC it / ACC it = 1 - OACC it / ACC it

CSVT it = 1/(1 - OACC it / ACC it)

### Where:

ACC it: total accruals of firm i in year t.

I it: Inventories of firm i in the year t.

NA it Net profit before the company's unexpected items

### **Cost of Capital**

Total cost of capital for a company equals to weighted average of different cost sources of funds used by the company and the coefficient (weight) of each source is calculated relative to the company's capital structure. Method of calculating the weighted average of capital cost is as follows (Hajipour, 2009):



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$$\frac{S_{i}}{D_{i} + S_{i}} + kd \frac{D_{i}}{D_{i} + S_{i}} WACC = ke$$

Where:

WACC1: weighted average of capital cost of the company during the period in question

kd: The effective rate of corporate debt during the period

ke: The cost of the common stock of the Company during the period in question

D2: The average rate of corporate debt (book value) during the study period

S3: The average of common equity (book value) of the company during the period in question

### Calculation of the cost of debt (Kd)

The cost of debt is a proportion of capital cost paid for funds that have been supplied from outside of the company. This cost includes in fact interests paid for interest-bearing liabilities such as as short-term and long-term loans. In the case of companies that have issued bonds as well, it is added to the cost of the bonds. Regarding the multiplicity of loans received by the company, an average can be considered as interest and debt costs. Since the rate of the facilities granted to industry is 16 percent according to the Central Bank circulars to banks, this rate is regarded as the cost of corporate debt. It is noteworthy that all sample companies are active in industry section and none of them is in agriculture and service companies (Izadi Nia, 2009).

### Calculation of the cost of equity (Ke)

Based on the experience of other investigators and with regard to the rapid growth of stock indices in the past few years, the researcher cannot employ  $CAPM^1$  model because the rate of return obtained for ordinary shareholders was too high due to the high level of  $R_m$ .

Another tested model is E/P method. With respect to enhancement of general price level and the growth of E/P ratio in stock, the obtained ke value will be high, which adds the problems of calculation. Gordon model was the last one used as follows (Etemadi et al, 2010):

$$Ke = \frac{D_1}{P_0} + g$$

In the above formula,  $P_0$  is stock price before the last year Assembly and D equals to the dividend in the intended year.

### Firm Size

There are many available standards for measurement of "firm size" including the amount of total assets, selling rate and number of employees (Akbari, 2008).



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Napierian logarithm of total assets is used to measure the the variable "firm size".

### Financial leverage

This ratio is used to evaluate and determine the relationship between the financial resources of the business in terms of debt or equity; indeed, this studies their composition methods. This research selects division of book value of long-term debts to total assets (Sinaie and Nissi, 2003).

### **Testing Research Hypotheses**

### **Descriptive statistics**

Descriptive statistics for variables including unconditional conservatism (UNCC), conditional conservatism (COC), the cost of capital (CC), financial leverage (FL) and firm size (SIZE) are given in Table 1.

According to the descriptive statistics, the distribution of these variables in different companies is low. The highest standard deviation relates to the cost of capital and the lowest standard deviation belongs to financial leverage.

Evaluation of skewness and elongation of each variable in comparison with the normal distribution shows that all research variables are normally distributed because when the absolute values of numbers related to skewness and elongation are great, hey are very different from the normal distribution.

### **Normality Test of Variables**

Kolmogorov-Smirnov (K-S) test is used to examine the normality of variables in this study.

As can be seen, since the level of significance of all variables more than 0.05, variables are normally distributed.

### **Correlation Test**

According to the above table, conditional conservatism and unconditional conservatism are positively correlated with the cost of capital, financial leverage and firm size.

### **Regression Significance Test**

According to the F statistics on all tables of regression, as the significance level is less than 0.05, regression model is significant in all tests of hypotheses.

### Multicolinearity test

As it is seen, eigenvalues near zero for internal solidarity of forecasts are great and small changes in the amount of data can lead to large changes in the estimated coefficients of the regression equation. Eigenvalues indicates the the possibility of correlation between the variables. Status indicator more than 15 indicates the possibility of multicolinearity between independent variables. Values more than 30 signify a serious problem in the regression of the status quo (Hasas Yeganeh et al, 2009). Moreover, all indicators of status are less than 15 implying absence of multicolinearity between independent variables.



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### Non-autocorrelation Test

Durbin-Watson statistics in each of tesy hypotheses indicate the autocorrelation tests among research variables. Since this statistic in each table of regression testing is 1.5 to 2.5, there is not an autocorrelation problem between variables.

### **Hypothesis Testing and Results**

The results of Lymr F test are mentioned in the following table:

In testing F, null hypothesis shows the use of data integration method in contrast to the opposite hypothesis, or the use of panel data method. Due to the significance of this table, the results of these tests suggest that the studied sections are heterogeneous and panel method is better. After selection of panel data using F Lymr, Hausman test is conducted. If the null hypothesis (H<sub>0</sub>) is accepted in this test, random effects model will be used unless fixed effects model will be used.

The results show that the value of this statistics for each model is significant; significance levels reported in the table above (p-value <.05) indicate the rejection of hypothesis H<sub>0</sub> with 95% confidence level for each model. These findings imply the use of fixed effects method.

This research has a primary hypothesis and two secondary hypotheses. Secondary hypotheses are analyzed in the following.

### Testing the first secondary hypothesis

The first hypothesis considers the effect of conditional conservatism on the cost of capital.

As the table shows, financial leverage, and firm size (p-value<5%) have positive and significant impact on conditional conservatism. Coefficients indicate that the effect of firm size on conditional conservatism is more than the other variable.

According to the F-statistics, fitted regression model is significant; according to the coefficient of determination, these variables explain 19.7% of the variation of conditional conservatism.

As Durbin-Watson statistics is 1.5 to 2.5, there is no problem of autocorrelation among the variables.

### Testing the second secondary hypothesis

The second hypothesis considers the effect of unconditional conservatism on the cost of capital.

As the table shows, financial leverage, and firm size (p-value<5%) have positive and significant impact on unconditional conservatism. Coefficients indicate that the effect of firm size on unconditional conservatism is more than the other variable.

According to the F-statistics, fitted regression model is significant; according to the coefficient of determination, these variables explain 19.7% of the variation of unconditional conservatism.

As Durbin-Watson statistics is 1.5 to 2.5, there is no problem of autocorrelation among the variables.



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### **DISCUSSION AND CONCLUSION**

The important findings of this study can be stated as follows.

- 1- Conditional conservatism has a direct and significant impact on capital cost of listed companies in Tehran Stock Exchange during the years 1388 to 1392. Then, it could be argued that the companies with high conditional conservatism exaggerate in the presentation of their financial statements about real costs of capital.
- 2- Unconditional conservatism has a direct and significant impact on capital cost of listed companies in Tehran Stock Exchange during the years 1388 to 1392. Then, it could be argued that the companies with high unconditional conservatism exaggerate in the presentation of their financial statements about real costs of capital.
- 3- According to the multiple regression equation coefficients, conditional conservatism impact on the cost of capital is greater than the unconditional conservatism. This point out to the important issue that good and bad news, which are not few in Iran capital stock, cause more conservative accounting practices.
- 4- Financial leverage has a direct and significant impact on capital cost of listed companies in Tehran Stock Exchange during the years 1388 to 1392. Thus, it could be argued that companies with higher financial leverage reflect higher conservatism in financial statements.
- 5- Firm size has a direct and significant impact on capital cost of listed companies in Tehran Stock Exchange during the years 1388 to 1392. Thus, it could be argued that greater companies show higher conservatism in financial statements.

These findings are in line with the results of Bani Mahd and Baghbani (2009) and they are contrary to the research conducted by Chen et al (2009).

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Table 1: Descriptive analysis of research variables

Variable	Number	Minimum	Maximum	Mean	Standard deviation	Variance	Skewness	Elongation
UNCC	115	1.132	3.841	0.365	0.142	0.025	-0.299	0.213
COC	115	1.204	4.026	0.776	0.159	0.015	0.943	0.389
CC	115	0.023	0.876	0.227	0.453	0.286	0.291	0.115
FL	115	1.130	8.551	3.935	0.104	0.098	0.119	0.257
SIZE	115	0.131	12.992	5.021	0.156	0.327	0.306	0.209

**Table 2: Normality Test of Variables** 

Variable	Kolmogorov-Smirnov Z	Significance level
UNCC	2.031	0.238
COC	1.712	0.691
CC	1.450	0.299
FL	1.741	0.642
SIZE	1.869	0.176

Table 3: Pearson correlation test for research variables

Variable	UNCC	COC	CC	FL	SIZE
	1	0.835	0.294**	0.432**	0.520**
UNCC					
	0.853*	1	0.385**	0.407**	0.196**
COC					
	0.294**	0.385**	1	0.180**	0.083*
CC					
	0.432**	0.407**	0.180**	1	0.68
FL					
	0.520**	0.196**	0.083*	0.68	1
SIZE					

<sup>\*\*=</sup> Significant at the 1% level of error

Table 4: Multicolinearity test

Variables	Eigenvalues	Status indicator
1	0.118	3.832
2	0.230	4.217
3	0473	5.514



<sup>\*=</sup> Significant at the 5% level of error

Table 5: Lymr F test (same intercept of points)

Null hypothesis	Models	F-	Freedom	p-	Test Result
		statistics	Degree	value	
The intercepts for all sections are identical	Model 1	2.6453	2	0.000	H₀ is rejected.
	Model 2	1.1325	2	0.000	H₀ is rejected.

Table 6: Results of the Hausman test (choosing between fixed and random effects)

Null hypothesis	Research	chi-square	Degrees of	p-	Test Result
	Models	statistic	freedom	value	
There is no	Model 1	5.4503	2	0.000	H₀ is rejected.
difference in					
systematic					
coefficients	Model 2	4.4528	2	0.000	H₀ is rejected.

Table 7: The multivariable regression results of conditional conservatism and cost of capital

Variable type	Variable type Symbo		coefficien	t-	Significance
	I		t	statisics	level
Dependent variable	Υ	Capital cost	-	1	-
Constant value	α	Alpha	-1.744	-1.648	0.025
Independent variable	X1	Conditional conservatism	0.603*	1.995	0.001
Control variabl	е	Firm size	0.438*	1.80	0.020
		Financial Leverage	0.627*	1.769	0.000
		Durbin-Watson	1.856	-	-
		F-statistics	3.742	1	0.003
R		Correlation coefficient	0.443	1	-
R Square		Determination coefficient	0.197	-	-
Adjusted R Square		Adjusted coefficient of determination	0.196	-	-

<sup>\*=</sup> The significance level is equal to 0.05.



Table 8: The multivariable regression results of unconditional conservatism and cost of capital

Variable type Symbol		Variable name	coefficient	t-statisics	Significance level
Dependent variable	Υ	Capital cost	-	-	-
Constant value	α	Alpha	1.765	1.544	0.002
Independent variable	X1	Conditional conservatism	0.357*	1.531	0.040
Control variab	le	Firm size	0.645*	1.985	0.001
		Financial Leverage	0.527*	1.875	0.000
		Durbin-Watson	1.775	_	_
		F-statistics	14.002	_	0.003
R		Correlation coefficient	0.668	_	-
R Square		R Square Determination coefficient		_	-
Adjusted R Square		Adjusted R Square Adjusted coefficient of determination		_	_

<sup>\*=</sup> The significance level is equal to 0.05.





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### RESEARCH ARTICLE

# Relationship between Profit Fluctuations and Uncertainty and its Effect on Investment in Companies Listed in Tehran Stock Exchange

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### **ABSTRACT**

In this research, the overall goal is investigating relationship between profit fluctuations and profit uncertainty and its effect on investment in companies listed in Tehran Stock Exchange. Two hypotheses are tested in this research: 1. there is significant relationship between profit fluctuations and profit uncertainty. 2. Possible relationship between profit fluctuations and profit uncertainty has significant effect on reduced investment in companies listed in Tehran Stock Exchange. It was done by model estimation. Firstly, 100 companies were divided into 5 groups. These companies were classified in following groups: very low profit fluctuations variance, low profit fluctuations variance, average profit fluctuations variance, high profit fluctuations variance, and very high profit fluctuations variance. Analysis of findings showed that in these companies, the higher is profit fluctuations; model's coefficient of determination is lower. In other words, increasing profit fluctuations increases errors of profit forecast. Overall, high profit fluctuations leads to reducedinvestment and the lower is profit fluctuations, more reliable profit is provided for investment. Thus, hypotheses in this research are supported.

**Key words:** fluctuations, profit, reduced investment, uncertainty.



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### INTRODUCTION

One of the main factors of economic development and growth in the countries is providing adequate capital for funding investment. Economic policies of the government regarding privatization of public companies for absorbing capitals of private sector and directing these capitals toward national economy construction has lead that large group of people tend to stock exchange market. Necessity for conducting experimental studies in recent decades has been done aiming at disclosing information load of accounting items. Today it has become evident more than ever, and they can be useful for decision makers and investors in emergent investment market of Iran which has boomed over recent years. The main purpose of financial reports as output of accounting systems is providing necessary information for performance evaluation and profitability ability of companies. Accounting profit is extensively used in evaluation of stocks and management performance and debt contracts. Thus, predicting accounting profit is important and investors decide for purchase, sale or preservation of stocks based on these information. They use profit forecast information for pricing stocks. Relationship between profit forecast and stock value of the company is important. Investors should believe that profit estimates are proper and accurate. Hence, profit forecast error is also important for investors, because it influences their decisions (Kordestani and Bagheri, 2009). This subject was selected for research for several reasons. First, there a large numbers of methods for profit forecast (in other words, for equity valuation) and scholars have limited knowledge in this regards especially in long term periods. Second, according to findings by Graham et al. (2005) there are evidence suggesting that profit fluctuations reduce profit predictability which leads to increased profit uncertainty and reduced investment. Third, profit fluctuations mainly result from two factors: a. fluctuations resulting from economic shock and computational problems of income accounting, which both factors lead to reduced profit predictability (Dichev and Tang, 2009). Thus, investigating relationship between profit fluctuations and profit uncertainty and its effect on investment in companies listed in Tehran Stock Exchange is crucially important. Considering experimental studies in relation with relationship between profit fluctuations and profit predictability and interest of investors for predicting profit for safer investments, thus current study aims at investigating factors affecting profit predictability (reliability of profit).

### THEORETICAL FOUNDATIONS

Concept of accounting profit includes excess of revenues over expenses for a given accounting period that represents a net increase in equity and results from continuous operations of the business unit and subsidiary operations, random events and other activities, events and circumstances affecting the business unit which can be identified and measured in accordance with Generally Accepted Accounting Principles (Belkooee, 2002). According to Fisher, economic concept of profit is a series of events which are associated to different states: enjoying mental profit, actual profit and monetary profit. Mental profit is real consumption of goods and services which causes mental pleasure and satisfying the demands. Mental profit is a psychological concept which cannot be expressed approximately. Actual profit is expression of events which cause emergence or increasing mental pleasures. Profit quality means approximation of operational profit to cash flow resulting from operational activities which are calculated based on OCF/OE ratio. The larger is this ratio, profit quality is higher. Profit quality in this study means the higher are relevance and reliability features of the profit constituents, profit quality is higher. Stock exchange market lexically means a French term as wallet. Stock exchange market means an integrated and formal capital market in which company's stock sale and purchase or sale and purchase of government bonds or bods of private institutions are done under certain rules and regulations. The main characteristic of stock exchange market is legal support for owners of capitals and stagnant capital and legal requirements for applicants of investment. On the other hand, profit fluctuations can be defined as follows: economic and accounting factors are factors which influence relationship between profit fluctuation and predictability (Haghighat - Motamed, 2011) and severe profit fluctuations causes more serve reduction in investment. Such profit fluctuations create profit uncertainty. Objective of smoothing is reducing effects of profit fluctuations which can be defined as follows: many authors studied and investigated objective of profit smoothing over recent years. For example, Barnea, et al (1976) consider profit smoothing as



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intentional reduction of profit fluctuations as activates of the company seem normal. Managers do profit smoothing in order to reduce these fluctuations, and this manipulation has positive effect on stock value and management performance. Copland (1986) defines net profit as ultimate objective of smoothing. Imhuf (1981) states that various levels of profit includingdiluted profit per share, net income, net income before unexpected items, operating profit and gross profit are all subject to smoothing. Beattie et. al. (1994)mentioned profit before tax as the purpose of profit smoothing. Recently studies have been conducted by Michelson et al. (2000). They consider operating profit after deducting depreciation, profit before tax, profit and net profit before unexpected items as the objective of smoothing by the managers. Tehran Stock Exchange was established in 1967. According to its constitution, purpose of establishing Tehran Stock Exchange is mobilizing private savings and allocating them to industrial and manufacturing investment. Changes of Tehran Stock Exchange can be divided into three periods. First time period is 1967 to 1978 which was along with gradual booming in Tehran Stock Exchange. In this period the number of stocks listed in Tehran Stock Exchange and volume of securities transactions gradually increased. The second period started since mod 1978 along with publicstrikes and struggles and it continued to the end of Iran – Irag War. In this period. volume of transactions in Stock Exchange strongly reduced because of nationalization of banks and industries and distrust of private sector to investment security. Third period started since 1988, i.e. along with beginning of first economic development plan. It was accompanied by implementation of privatization of public units and Stock Exchange boomed again in this period. The number of companies listed in stock exchange market: in the first year of stock exchange market activity (1967), stocks of 6 companies were transacted. These stocks included: Shares of Bank of Industry and Mine, Pars Oil Company's stock, Government bonds, Treasury, bonds of Industrial Property Development Organization and Abbas Abad bonds. In 1978, the number of companies reached to 102 units and in 1978, total of 105 companies attended in stock exchange market. However, with emergence of Islamic Revolution and the incidence of strikes and holidays, repatriation of capital and the country's currency exchange occurred and activity of stock exchange market collapsed. In 1979, with approval of a bill on consolidation and nationalization of banks and insurance companies, as well as approval of Iranian industries development and conservation, stock of 24 banks and 2 insurance companies and 21 manufacturing and industrial companies eliminated from the stock exchange market, and only 48 companies with limited transactional volume remained in the stock exchange market. This depression continued until UN Resolution 598 was accepted and formulation of economic development plan moved the stock market, and in the second half of 1989, a numbers of companies eliminated from the stock exchange again asked for joining the market. They could be introduced in the rates table following stabilization of financial structure, and since then the number of listed companies was increased.

### **REVIEW OF LITERATURE**

Considering this research is on relationship between profit fluctuations and its uncertainty and its effect on reduced investment in companies listed in Tehran Stock Exchange, thus studies which are concerning profit quality are also introduced in this research. Kordestani and Lotfi (2011) conducted a research entitled "relationship between profit forecast error and accruals, profit forecast error - accruals" and investigated relationship between forecast error of management from future profit of the company and current year accruals. Ardakani and Mahmoodian (2010) conducted a study entitled "evaluation of capabilities of cash and accrual components of profit in forecast of unusual profit and value of companies listed in Tehran Stock Exchange". Dastgir et al. (2007) investigated factors affecting bias of managers in profit forecast, bias of managers in profit forecast, firm size, financial crisis, growth rates, external financing and price control price. They also studied fives factors including the firm size, financial crisis, growth rates, external financing and price control price and their effect on profit forecast. Baroa (2006) studied two criteria of relevance and reliability for quality measurement and found high profit quality in companies cause that investors can decide better on their investment. Dichevand Tang(2009) investigated relationship between profit fluctuations and profit predictability. They studied relationship between profit fluctuations and profit predictability and found profit fluctuations play determining role in profit forecast in long term and short term and this relationship is negative. Abodie et al. (2005) studied profit quality, confidential information based transactions and capital costs in their study



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entitled "profit quality, confidential information based transactions and capital costs" and they investigated relationship between capital costs and information asymmetry in stock exchange market..

Research Model and Hypotheses

Research model is stated as follows:

$$E_{it} = \alpha + \beta E_{it-1} + \varepsilon_{it} (1)$$

Where the variables are introduced as follows:

 $E_{it}$ : Netprofit for company i at year t

 $\boldsymbol{E}_{it\text{--}1}$  : Net profit for company i at year t-1

This model is estimated using Panel Data method for time period 2006 – 2011.

Research hypotheses include as follows:

There is significant relationship between profit fluctuations and profit uncertainty.

Possible relationship between profit fluctuations and profit uncertainty has significant effect on reduced investment in companies listed in Tehran Stock Exchange.

### Research Scope

Research scope in terms of location and time and subject is as follows: local scope includes all companies listed in Tehran Stock Exchange (considering temporal scope), and it is regardless of geographical establishment place of these companies in different cities of the country. Temporal scope was considered as 2006 to 2011. Subject of the research is investigating relationship between profit fluctuations and profit uncertainty in companies listed in Tehran Stock Exchange.

### **METHODOLOGY**

It is an experimental research in descriptive – regression accounting research studies based on actual information in financial statements of the companies. On the other hand, it is a correlation study, and since it can be applied in information usage process, it is somehow an applied research. Fir conducting this research, RahavardNovin, **EViews** and EXCELL software were used.

Statistical Population and Sample Size

In order to conduct this research, companies listed in Tehran Stock Exchange were considered as statistical population and statistical sample was selected among these companies. The sample does not include companies



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which are active in investment and financial intermediation because of their different nature and type of activity. The sample includes companies with following characteristics:

Companies which were listed in Tehran Stock Exchange during 2006 to 2011

Companies which end of their fiscal year is March 20.

These companies should not have stopped operation or change in financial period during the period of study.

They should not be among investment companies.

Statistical population which includes 100 companies and it is divided into 5 groups of 20 companies.

Data Collection Method

Information used in this research isdivided into two classes. Firs class is information related to theoretical foundations and reviewed literature which wasprovided by studying papers and domestic and foreign theses available via internet and internal and external journals through library documents. Second class of information is information related to data of research variables. Data needed by the research for testing the hypotheses were collected by auditedfinancial statements of the companies listed in Tehran Stock Exchange (available in the library of Tehran Stock Exchange) as well as TadbirPardaz Software (containing information of companies listed in Tehran Stock Exchange including financial statements, price, various indexes, etc.).

Data Analysis Methods and Tools

As mentioned previously, research model is stated as follows:

(1) 
$$E_{it} = \alpha + \beta E_{it-1} + \varepsilon_{it}$$

If above model is variance, then:

(2) 
$$VAR(E_{it}) = \beta^{2} VAR(E_{it-1}) + VAR(\varepsilon_{it})$$

Assuming that variance is fixed over the time, by ordering Equation 2 there is:

$$VAR(\varepsilon_{it}) = VAR(E_{it})(1 - \beta^2)$$

In Equation 3, VAR ( $E_{t}$ ) is proxy of profit fluctuations and VAR ( $E_{t}$ ) is profit uncertainty or inverse of profit predictability. Thus, companies under study are put in five groups (from high to low profit fluctuations), and Equation 1 is estimated for each of groups. Thus, it is expected that companies with higher profit fluctuations will have higher profit uncertainty and lower profit predictability.

Statistical methods used in this work include correlation coefficient, coefficient of determination, significant test of independent variable, autocorrelation test and graphical tests for investigating model stability.



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Augmented Dickey Fuller (ADF) Unit Root Test for Ranking Accumulation of Variables

in order to test non-static state based on Dickey Fuller (ADF) Unit Root Test, it is assumed that time series under discussion has an auto explanatory first order process, then  $\rho=1$  is tested accordingly. Now, if time series has auto explanatory p order process, relation estimated for p test does not have correct specification, and Augmented Dickey Fuller (ADF) Unit Root Test should be used so that boundary distribution and critical quantities obtained can be cited in the interval. Augmented Dickey Fuller (ADF) Unit Root Test is done using main variables (in two states; considering and regardless of the trend). If variables are at steady state, the variable is accumulation variable of zero-order or I(0). But if variables are not at steady state, unit root test is done on first order difference of these variables. If variable is steady state after one order differential, this variable is accumulation variable of one-order or I(1). Results of unit root test for variables at first order level and difference are given in Table 1.

MacKinnon critical values at the critical level 5% for variables at level (without trend) = -2.9434

MacKinnon critical values at the critical level 5% for variables at level (with trend) = -3.45366

MacKinnon critical values at the critical level 5% for first order difference of variables (without trend) = -2.9458

MacKinnon critical values at the critical level 5% for first order difference of variables (with trend) = -3.5403

Considering above results for unit root test, it is concluded that profit variable for companies with average, high and very high variance is non-static and it is static for other companies.

**Estimation of Regression Models** 

Regression model is specified as follows for this research:

$$E_{it} = \beta_0 + \beta_1 E_{it-1} + \varepsilon_t$$

In this model, E represents the profit. It should be noted that the model will be estimated for 5 groups and results of them are compared.

### Hausman Test

In this section, regression models are estimated. Firstly the models are estimated with random effects so that it can be specified it is better to use model with random effects or model with fixed effects. It is done by Hausman test. Hausman test is estimated for five models (companies with very low profit fluctuations variance, low profit fluctuations variance, average profit fluctuations variance, very high profit fluctuations variance, and high profit fluctuations variance). Results of Hausman test are given in Table 2.

Considering critical level (Prob.) is smaller than 5 percent, models are estimated with fixed effects in this stage.

Model Estimation for H1

Estimation of five models for companies is given in Table 3.



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Sig level was considered as 95% in confidence level. In these estimations, following results were obtained. First profit interruption had significant effect on the companies except those with high profit fluctuations variance. It means that profit fluctuations in these companies are influenced by its previous values. Also, it is evident that the higher is variance of profit in companies, adjusted coefficient of determination in these companies in the model is lower. In other words, the higher is variance, it means that changes are increased, and the lower coefficient of determination means lower profit predictability. Hence, in these models it is observed that the higher is profit changes, predictability of profit is reduced and it leads to profit uncertainty. That is, first research hypothesis is supported. Also, Durbin – Watson statistics in the research models were estimated and it suggests there is no autocorrelation in the research models.

### Concepts of P - Value and Confidence Interval

In order to investigate whether test results are due to chance or random, P-Value test is used. However, this value only determines a cutoff point based on which we can claim that research findings are statistically significant or not, or to what extent the results are due to chance. If P-Value is small, the assumption that observed difference is obtained due to change would be improbable. Hence, real difference between methods is high. In contrast, if P-Value is large, the probable that observed difference is due to chance is high. Thus, primary hypothesis is accepted, i.e. there is no difference between methods. P-Value is conventional assumed as smaller than 0.05 so that significant difference between methods can be concluded. That is, in 100 respective tests, there are fewer than five tests which give difference between methods by chance, and the difference in 95 other tests is real. Thus, the difference between methods is accepted. Sometimes some studies consider P-Values smaller than 0.01 as the basis for presence of significant difference. That is, in 100 respective tests, there is below one test in which difference between methods is by chance, and the difference in 99 other methods is real, and this P-Value is used for clinical trail and tests with very high accuracy.

### Comparison of P-Value and Confidence Interval in Interpretation of Results

Statistical significance based on P-Value may do not result in clinical significance. In contrast, lack of statistical significance does not mean that findings of study are not significant clinically. By selecting P-Value as 0.05, which is used in most studies, important clinical effects may be overlooked and many of authors compare their findings with this level and judge on presence or absence of effect for respective variable, and it is due to the fact that individuals do not consider that P-Value has just statistical significance and significance of the clinical effect cannot be judged only based on it. in addition, if P-Value is smaller than 0.05, it is simply interpreted as rejection of null hypothesis as lack of evidence. Individuals do not consider that lack of adequate evidence in this study does not mean absence of significant difference. In other words, not proving a difference does not suggest its absence. Considering above facts, confidenceinterval can be used as a tool for determining significance and determining magnitude of the effect, direction, and difference between methods along with P-Value. Confidence interval represents power and strength of evidence regarding quality of the respectively variable. If P-Value is regarded as a measurement of evidence strength, against null hypothesis, by investigating confidence interval, conclusion can be made based on P-Value.

### Model Estimation for H2

Estimation of five models for companies is given in Table 4.

Sig level was considered as 95% in confidence level. In these estimations, following results were obtained. The higher is profit fluctuations and changes in the companies; its effect on reduced invested is higher. In other words, the higher is profit fluctuations variance; it will have higher effect on the investment. As observed in the above tables, t statistics is significant in all cases except for companies with high profit fluctuations variance. In addition,



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considering values for Durbin – Watson statistics in estimated models are smaller than 2.5, it can be stated there is no autocorrelation in the research model. Adjusted coefficients of determination represent that highest coefficient is related to companies with very low profit fluctuations and the adjusted coefficient of determination is reduced by increasing profit fluctuations and changes.

It means that profit fluctuations in these companies are influenced by its previous values. Also, it is evident that the higher is variance of profit in companies, adjusted coefficient of determination in these companies in the model is lower. In other words, the higher is variance, it means that changes are increased, and the lower coefficient of determination means lower profit predictability. Hence, in these models it is observed that the higher is profit changes, predictability of profit is reduced and it leads to profit uncertainty. That is, first research hypothesis is supported. Also, Durbin – Watson statistics in the research models were estimated and it suggests there is no autocorrelation in the research models which denotes effect of profit fluctuations variance on investment in the companies. Slope of adjusted coefficient of determination is reduced from companies with very low profit fluctuations steeply so that it reduces to 0.28 in companies with very high profit fluctuations from 0.92. In other words, it can be said that the higher is profit fluctuations in the companies; it will have higher effect on investment which negative inverse effect.

### RESEARCH FINDINGS

As observed in the estimation of research models, adjusted coefficient of determination is high in companies with very low profit fluctuations variance and the higher is fluctuations, adjusted coefficient of determination is smaller, and smaller adjusted coefficient of determination means that error in models is increased. In other words, profit predictability and strength is reduced and thus invested is decreased. Thus, it is observed that the lower is profit changes, profit predictability is increased and profit uncertainty is reduced and this relationship influences investment in the companies listed in Tehran Stock Exchange. Hence, research hypothesis is supported. That is, profit fluctuations have significant effect on profit uncertainty and reducedinvestment in the companies listed in Tehran Stock Exchange, and there is significant relationship between profit fluctuations and profit uncertainty.

### **CONCLUSION**

Profit forecastis one of the tasks which is addressed by investors and all actors in the capital market especially in stock exchange market. Authors believe that companies with reliable profit (with lower profit variance) provide more reliable investments. Studies by Ball and Brown (1986), Iston and Zemijosky (1989), Kenoti and Truman (1996) and Cross and Shredder (1984) showed that stock prices have positive reaction topositive changes in earnings per share and increased profits, and negative reaction to negative changes in earnings per share and decreased profits (Jagadesh and Titman, 2007). In the current research, it was found that increased profit fluctuations in the companies active in Tehran Stock Exchange leads to reduced profit predictability and reduced investment. It is consistent with theoretical expectations, because forecastof profit in the future years for companies with risky and fluctuated profits is more difficult. But in companies with more stable and less fluctuated profits, the investorexpects that such trend continues in the future years. Thus, individuals with feature of Risk aversion in the stock portfolio selection should invest in companies with less fluctuated profits which are more reliable. Findings of the current research are consistent with findings of previous works such as Graham et al. (2005) and Dichev and Tang (2009).

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Table 1: Unit root test for research variables

Variable				Result		
		L	evel	First orde		
		With trend	Without trend	With trend	Without trend	
Profit fluctuations	Very low variance	-1.9606	-0.5260	-5.5249	-5.7206	I(1)
	low variance	-0.5950	-1.7462	-3.5226	-3.8206	I(1)
	Average low variance	-3.2887	-3.9515	-	-	I(0)
	High variance	-3.4376	-4.0472	-	-	I(0)
	Very high variance	-2.9591	-3.6056	-	-	I(0)

Source: research calculations

Table 2: Hausman test

	companies wit	h very low profit fluctu	ations variance	
Hausman test	Test statistics	Degree of freedom	Prob.	Conclusion
	25.43	1	0.003	The model with
				fixed effects is
				better
	companies v	with low profit fluctuation	ons variance	
Hausman test	Test statistics	Degree of freedom	Prob.	Conclusion
	81.24	1	0.000	The model with
				fixed effects is
				better
	companies wi	th average profit fluctua	tions variance	
Hausman test	Test statistics	Degree of freedom	Prob.	Conclusion
	16.49	1	0.006	The model with
				fixed effects is
				better



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	companies with high profit fluctuations variance								
Hausman test	Test statistics	Degree of freedom	Prob.	Conclusion					
	48.70			The model with fixed effects is better					
	companies wit	h very high profit fluctu	ations variance						
Hausman test	Test statistics	Degree of freedom	Prob.	Conclusion					
	13.36	1	0.001	The model with fixed effects is better					

Source: output of Eviews 6 software

Table 3: Coefficients of fitted model for companies

	,	ery low profit fluc	tuations variance		
Variable	Variable	SD	T statistics	p-value	Sig. level
	coefficient				
intercept	2845.891	628.5149	4.527961	0.0000	Significant
First					Significant
Interruption of					
profit	0.402406	0.118	3.410228	0.0010	
Adjusted			Durbin-Watson	2.2	9
coefficient of	0.9	96	statistics		
determination					
		low profit fluctu	ations variance		
Variable	Variable	SD	T statistics	p-value	Sig. level
	coefficient				
intercept	15103.79	124.0198	121.7853	0.0016	Significant
First					Significant
Interruption of					
profit	-0.12626	0.008336	-15.1469	0.0000	
Adjusted	0.9	95	Durbin-Watson	1.63	
coefficient of			statistics		
determination					
		Average profit fluc	tuations variance		
Variable	Variable	SD	T statistics	p-value	Sig. level
	coefficient				
intercept	9526.719	2096.051	4.545081	0.0000	Significant
First					Significant
Interruption of					
profit	0.39209	0.123471	3.175572	0.0021	
Adjusted	0.0	32	Durbin-Watson	1.8	0



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			Т		
coefficient of			statistics		
determination					
		High profit fluct	uations variance		
Variable	Variable	SD	T statistics	p-value	Sig. level
	coefficient				
intercept	13944.13	3310.022	4.2127	0.0001	Significant
First					Non-
Interruption of					significant
profit	0.023703	0.107015	0.221489	0.8253	
Adjusted	0.46		Durbin-Watson	2.48	
coefficient of			statistics		
determination					
		Very high profit flu	uctuations variance		
Variable	Variable	SD	T statistics	p-value	Sig. level
	coefficient				
intercept					Non-
•	5198.742	3379.047	1.538523	0.1279	significant
First					Significant
Interruption of					
profit	0.390266	0.128213	3.043896	0.0032	
Adjusted	0.24		Durbin-Watson	2.17	
coefficient of			statistics		
determination					

Source: research findings (output of Eviews 6 software)

Table 4: Coefficients of fitted model for companies

very low profit fluctuations variance						
Variable	Variable coefficient	SD	T statistics	p-value	Sig. level	
intercept	2721.73	599.53	4.55	0.0001	Significant	
First Interruption of					Significant	
profit	0.4214	0.118	4.4741	0.0011		
Adjusted coefficient of determination	0.92		Durbin-Watson statistics	2.31		
low profit fluctuations variance						
Variable	Variable coefficient	SD	T statistics	p-value	Sig. level	
intercept	8526.741	2296.053	5.545231	0.0011	Significant	
First Interruption of					Significant	
profit	0.410021	0.134511	3.166416	0.0021		
Adjusted coefficient of determination	0.8	1	Durbin-Watson statistics	2	.2	



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		Average profit flu	ctuations variance		
Variable	Variable	SD	T statistics	p-value	Sig. level
	coefficient				
intercept	9526.719	2096.051	4.545081	0.0000	Significant
First					Significant
Interruption of					
profit	0.39209	0.123471	3.175572	0.0021	
Adjusted	0.	82	Durbin-Watson	1.80	
coefficient of			statistics		
determination					
		High profit fluct	uations variance		
Variable	Variable	SD	T statistics	p-value	Sig. level
	coefficient				
intercept	15111.13	3410.323	4.3541	0.0001	Significant
First					Non-
Interruption of					significant
profit	0.034121	0.106514	0.229257	0.9241	
Adjusted	0.42		Durbin-Watson	2.49	
coefficient of			statistics		
determination					
		Very high profit flu	uctuations variance		
Variable	Variable	SD	T statistics	p-value	Sig. level
	coefficient				
intercept					Non-
	5578.666	3451.152	1.578521	0.1641	significant
First					Significant
Interruption of					
profit	0.43521	0.192141	3.544794	0.0039	
Adjusted	0.28		Durbin-Watson	2.27	
coefficient of			statistics		
determination					

Source: research findings (output of Eviews 6 software)



### **RESEARCH ARTICLE**

### **Demographic Transition and Human Capital**

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### **ABSTRACT**

Since population aging and severe productivity rate reduction leads to adverse impacts on economic activities through influencing labor force supply, demographic policies in Iran have shifted to population growth from population control. However, only of human capital increase by increasing the population, population growth will lead to reduction of adverse impacts. Thus, three criteria are calculated to measure demographic transition speed and thus it is shown that Iran is one of the countries in the region which experiences high demographic transition speed. Then, impact of increased productivity on investment in children human capital by the household and formation of human capital in two separate models at rural and urban levels is investigated. It is accomplished using two models at micro level as well as using information of household spending and revenue plan for Iranian families in 2013. GMM estimator is used in the first model, and impact of the number of children onlogarithm of per capita educational spending of children as household investment in human capital of children is investigated using instrumental variable method and cross-sectional data. Using ordinary least squares (OLS) the second model, impact of the number of children on average educational grades passed by children as human capital of children is examined. Findings suggest positive impact of the number of children on investment in human capital. Also, findings indicate household behavioral reaction varies in rural and urban areas. According to the first model, results show increase in the number of children does not lead to reduction of investment in children's human capital. However, based on the second model, results indicate increased investment in human capital cannot guarantee human capital growth and thus improve economic performance of the country following population growth motivation.



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Key words: Demographic transition, human capital, instrumental variable, generalized momentum

### INTRODUCTION

Demographic transition meanstransfer of high birth rate and high death rate to low birth rate and death rate in line with changing the economic system of a country from non-industrial to industrial system.

Research works by United Nations Population Fund indicate Iran had first rank in fertility rate changes during 1975 – 1980 and 2005 – 2010. Fertility rate change in two periods was -71 percent (from 6.5 in 1975 – 1980 to 1.83 in 2005 - 2010). Thus, increased life expectancy and aging in baby boom and growth in labor force reduction in Iran is increasing with reduction in fertility rate. Population aging rate indicates Iranian population is quickly moving toward aging. According to information provided byCensus of Population and Housing by Statistical Center of Iran, ratio of population aging (population above 60 years old vs. 0 – 14 years old population) has become about tripled during 1976 to 2006, so that population aging percent was 11.8 percent in 1976 and 29 percent in 2006. According to recent predictions of United Nations Population Fund, ratio of elderly dependency in Iran (population above 60 years old vs. 14-65 years old population) will become at least 5 times during 1975 – 2045. In other words, this ratio was 1:16 in 1975 and it is predicted it is 5:16 in 2045. Changes in population age composition are developed in such conditions.

As observed in Figure 1, following a reduction in early 1990s, young population ratio (0-14 years old) continues decrease in the next decade and it is expected this reduction will continue in the future, and it will be reduced to 12 percent in 2045 from 23 percent in 2010. In comparison, population ratio in age group 25 - 34 increased during 1991 - 2011 and then it will decrease. That is, it will decrease to 12 percent in 2045 from 21 percent in 2010. Population ratio of age group 35 – 54 will increase considerably during two future decades and then it will decrease quickly, which actually represents demographic shock resulting from population explosion in population structure. In continuation of population explosion impacts it is predicted that population ratio in ge group above 55 will increase to 20 percent in 2025 from 12 percent in 2010, it will increase in long-term in high severity, and it will reach to 40 percent in 2045. Predictions indicate Iran's population will increase over 200 percent during 20 next years. In fact, severity of population aging will manifestsince 2028, and it means elderly population explosion. That is, it is expected age composition of the population will change considerably in the next decade. Overall, UN prediction on demographic changes in different age groups indicate increase in age average especially in developing countries and it is predicted share of 60 and above year population will increase to 48.3 percent in 2025 from 37.7 percent in 2000. Iran is moving on the same path, though it is considered as a new community in comparison with such countries as China and Korea (World Bank, 2007). However, following wide and rapid changes in population during two last decades, Iran is moving toward population aging.

Considering census results in Iran, Iran's population has increased by about 2.7 during 1965 to 2005, and Iran's elderly population has increased by 3.13 during the same period. Thus, average elderly population growth was higher than average population growth in the country by 1.2. This phenomenon along with increased young population (positive immigration rate)causes that our country quickly enters aging stage. In other words, investigation of some age indexes in the country's population over recent decades indicatesage structure of the country's population has changed and average age of the population in the country is highly increasing. According to above data, reduction in labor force growth is inevitable, and if relative reduction in labor force is not compensated by increased productivity, it would have considerable long-term consequences on production capacity growth. Increase in labor force's relative deficiency and thus increase age of the population will lead to reduction on national saving, increased severity of using physical asset, increase in real wages and reducedinterest rate. In fact, human capital growth can be considered as an alternative for this issue. Cutler (1990) in a paper entitled An aging society: opportunity or challenge regarding severity of population aging problem and its related policies showed that population changes will lead to recued per capital income within next 60 years if it is not accompanied by capital



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utilization severity. One of the simplest ways to combat this problem or at least minimizing adverse impacts is simulating population growth. In other words, concerns on change in fertility rate and reduction of young labor force in the future will lead to elimination of family planning program and replacing general demographic polices. Considering inclusion of macro demographic policies on agenda and elimination of family planning program, current research work was conducted aiming at investigating impact of these polices on accumulation of human capital considering behavioral responses of households, because the main elements of new demographic polices include: Increase in fertility rates over the succession, reducing the age at marriage, improving life expectancy through increased insurance coverage, empowerment of population at working age through public education system, geographical redistribution of population, and migration management.

This paper is organized as follows: in section 2 a summary of theoretical grounds and review of literature is provided. Section 3 gives data, methodology and regression models. Results of cross-sectional regression based on household spending and revenue plan data for tor household behavior in selection of quality and quantity of children are described in section 4. Results of estimations are analyzed in section 5.

### TheoreticalGrounds and Review of Literature

Most studies on effects of demographic characteristics on economic features do not address household behavior regarding human capital explicitly, rather they investigate household behavior regarding investment in human capital through such variables as household revenue and men and women educational level and replacement between quality and quantity of children. Experimental discussion on human capital in economic models was entered to economics literature since second half of the 1980s.thus, there a few micro studies in this area using Iranian households' information. However, there are various macro studies, started by Barro and Lee, which addressed this issue in different aspects at macro level. Economic growth issue has changed considerably in terms of items influential ongrowth, endogenous, exogenous of variables such as human capital variables in the model, production function type, increasing or decreasing relative to the scale of production inputs, capital definition and its separation to physical and human capital, key variables or policy variables of the model since era of Yung (1928), Harrod and Domar (1948), Solow-Swan to Romer (1986), Lucas (1988), Barro (1990), Mankiw, Romer, Barro (1992), Becker, Murphy, and Tamura (1990) and until 2000. In preliminary models, production depends on the capital per capitaand stable growth occurs when savings rate divided by capital reaches to production equal to exogenous rate of population growth. In Solow - Swan Model, policy variables include population growth rate, savings rate and capital per capita. This model has been a guide for economic policy makers at international arena for long years. To this end, the emphasis is put on encouraging physical investment through increasing saving rate. Events in real world led to change in thoughts from physical capital to indigenous growth models, so that Lucas (1988) proposed his model inspired by Becket's theory (Becker, 1964). He considered production as associated to physical and human capital. In his model, human capital growth is dependent on a percent of human capital which is spent on its reproduction and leads to labor force's productivity growth. However, in Lukas's capital accumulation equation, human capital is not only a function of household's decisions and performance (the time spent by household on children education), but also the society (in other words, educational system) influences it too.

In fact, inclusion of human capital discussion in utility function in the mid-1980s proved a surprise. However, this question was not answered: what is human capital and how is it accumulated? Human capital is the knowledge and creativity institutionalized in the individual, part of which is acquired from the family and school environment, and part of which is inherent which is transferred through inheritance. To this end, the years of individuals' education are the indexes used for human capital measurement. Each family considers investment in household's human capital through spending their educational spending when they are going to decide on the number of children. In other words, household's fertility decisions play key role in children's human capital accumulation. Studies on economic effects of change in fertility rate dates back to the initial works of Becker (1960), who attempted to describe fertility pattern as one of outcomes of economic decisions by economic actors using rational behavior, and it has a long



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history in economics. Negative relationship between the quantity and quality of children in a family has been approved in experimental studies using statistical methods and many authors have sought for theoretical model to determine children quantity and quality interaction in the family. Becker and Lewis (1973) were those who firstly extracted interaction of children quality and quantity within a balanced framework resulting from maximization of utility by the household without presence of assumptions with no theoretical basis. Upon observation of several reductions in fertility rate to increase in capital per capita, authors attempted to introduce Becker's children quality and quantity interaction in the growth literature implicitly.

Many studies have been conducted using micro data regarding interaction between children quantity and quality. Based on their results children from larger families have been shown to receive smaller human capital investments such as Rosenzweig and Wolpin 1980, Downey 1995, Cáceres-Delpiano 2006 and Hongbin, Junsen et al. 2008, have worse educational outcomes such as Ponczek and Souza 2012, and receive diminished financial transfers from their parents such as Emery 2013, though thestrength of some of these relationships has been questioned such as Angrist, Lavy et al. 2010, Ferrari and Zuanna 2010, Fitzsimons and Malde 2014. Also many international studies studied relationship between demographic indexes or population structure with capital per capital growth. However, the studies have not seriously considered applications of indigenous growth theories with assuming indigenous fertility decisions in the family considering possibility to select childrenquantity and quality. Meanwhile, some recent indigenous models considered fertility decisions as exogenous and proved multiple equilibriums, and have sought for providing explanation for transition from Malthusian equilibrium with high fertility rates and with no growth with low rates of sustained growth in modern equilibrium (for example, Becker, Murphy, and Tamura, 1990; Tamura, 1996; Lucas, 2002). According to these theories, transition from equilibrium with no growth to equilibrium with sustainable growth lead to increased benefits of investment in human capital and thus change in household decisions toward increasing quality of children versus quantity of children. That is, lower fertility rate and higher investment in human capital per each child. In other words, these theories indicate economic growth, human capital accumulation and demographic transition change through shift in fertility pattern, which results from change in benefits of investment in human capital.

Becker, Murphy, and Tamura (1990) interpreted applications of recent research works on fertility decisions and investment in human capital in economic growth field. They proposed a dynamic general equilibrium model with two developmentregimes in stable condition: A Malthusian regime of high fertility, lack of human capital accumulation, lack of economic growth and an economic growth regime of low fertility, high investment in children's human capital and positive growth. Also they provided an integrated explanation for fertility behavior, investment in human capital and different performance of economic growth. They did not explain indigenously how a country starts demographic and economic transition from a development regime to other development regime. Tamura (1996)introduced external effects subject to human capital in human capital investment or international knowledge or effects of human capital overflow from other developed countries, and showed possibility for indigenous demographic transition from Malthusian regime to the economic growthregime. Tamura (1996) also indicated there is convergence between a collections of countries, which develop demographic transition. This conditional convergence result from overflow of international knowledge and multiple equilibrium. However, with a world with growing human capital inventory and thus increasing benefits of investment in human capital in the follower countries, one of the main propositions of Tamura is quicker growth of the countries which have had later transition. That is, quicker growth of countries with later transition. In parallel to Tamura, Lucas (2002) considered sustained economic growth since the late nineteenth century - industrialization era - as the West's Industrial Revolution spread to other parts of the world. In addition, he showed countries with regime of free trade and the protection of private property rights have changed in household's decision from selecting children quality to selecting children quantity and experienced demographic transition along with increased capital per capita. Considering discussed theories, demographic transition, human capital accumulation and sustained capital per capita growth can be considered various manifestations of the same phenomenon, like other factors which change through change in household fertility decisions in reaction to change in human capital investment benefit.



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The main index in micro analysis of household behavior in decision making is fertility rate (quantity of children) and investment in children's human capital (quality). Becker and Lewis introduced idea of utility in child-bearing for the first time. The main argument in Becker and Lewis is that even if child quantity and quality enter separately in utility, they are still closely connected through the household's budget constraint. Child quality is modeled as goods spending on each child. This implies that if child quality increases (more spending per child), increasing quantity (more children) becomes more expensive. Conversely, if quantity increases, increasing quality also becomes more costly, because the spending on quality accrues for each child.

According to conventional theory of consumer it is assumed that families obtain utility by consuming goods and services. Thus, household's budget constraint is spent on purchasing goods and services which provide maximum utility for the household. In Becker – Lewis method, not only consumption goods and services are concerns of the household (parents), but also they are worry about investment in children's present and future welfare. Improvement in children's quality is feasible through their education cost (investment in human capital), spending in current consumption and provision for the future consumption (inheritance). This view to household behavior is allocation of time to rest, work, education, parenting, fertility, consumption, savings, and investment in human capital and inheritance. Parents have a utility function, which is function of their consumption. In other words, their consumption is a combination of goods and services and children quantity (quantity of children is considered as continuous for simplicity reason), and quality (part of revenue which is spent on education). Utility function and household budget constraint is stated as follows:

$$U - U(x) + b$$

$$P_{x}X + P_{n}n + P_{\sigma}n = I$$

In which n denote quantity and q denote quality of child,  $P_{x_i}P_n$  and  $P_q$  are, respectively, prices of good and services, cost of child and cost of child's quality that includes the cost of educationand health. Marginal cost of additional child is Pq+Pn, since part of prices determined by household and the rest determined in competitive market the Nonlinear Budget Constraint is developed so demand for child's quantity decrease when income increased and Parents try to improve the quality of child.

As mentioned in this model, children quality is measured by the cost spent for welfare of children by the parents. In addition, price of the child is specified by the household and it is not like standard theory of consumer behavior. It is assumed that the child is a normal good and demand for child increased by revenue increase assuming fixed price. Even in this case it is possible that relationship quantity of children and revenue is negative. That is, demand for children quality (and not for children quantity) increases by increase in revenue. In this case, child price increases which is influenced by parent behavior. Price increase causes reduction in demand (quantity). Thus, children quality and quantity are replaced by revenue increase. The first conclusion is that revenue effect is negative on fertility. It was supported in international studies and time series comparisons. Experimental findings also a showed higher living standard is associated with lower fertility and higher costs for children quality.

### **Data and Methodology**

Demographic transition speed is one of the issues which is under-studied in demographic discussions and its impact on economic activities. Population growth rate and ratio of population at working age has rapidly changed by rapid reduction in fertility and death rate. In fact, in comparison with other countries in the region, Iran has experienced high speed in demographic transition. Thus, firstly indexes for measurement of demographic transition speed will be introduced and calculated based on the work by Hahn and Park (2010) on some South East Asian countries, and then it will be shown that Iranexperiences quicker demographic transition in comparison with other countries in the



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region. The countries under study in this research work include MENA countries, especially countries in the region mentioned in the 1404 Development Outlook. These countries include: Afghanistan, Algeria, Armenia, Azerbaijan, Bahrain, Egypt, Iran, Iraq, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Libya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, United Arabic Emirates, Uzbekistan and Yemen.

Variables used in estimating indexes to measure demographic transition speed include: Fertility rate, working-age population ratio and population growth rate. The criterion used to measure demographic transition speed was developed considering this fact that how an average demographic index changes over a specific time period for a country. The first criterion is the estimated coefficient for time periods when fertility rate is fixed and time periods from 1960 to 2012 as linear regression. Second and third criteria were estimated similarly for working-age population ratio and population growth rate. It should be noted index making for demographic transition speed of a country for a specific time period is possible only assuming it as fixed. However, it should be considered that demographic indexes move with a non-linear pattern, nota a linear pattern.

Following calculating indexes representing demographic transition speed, impact of demographic transition on formation of human capital was investigated using micro data ar household level. To this end, data of Iranian household spending and revenue census (2012) were used to study behavioral reaction of Iranian households in selecting children quality and quantity. To this end, factors affecting children's educational costs with emphasis on quantity of children were investigated at urban and rural level. It was done similar to what was conducted by Hahn and Park (2008) in Korea.

In fact, one of the main factors creating connection between demographic structure and economic performance is the decisions made by the households in relation with children quality and quantity interaction in reaction to change in human capital benefit rate. Based on data of Iranian household spending and revenue census, we seek for evidences regarding selection between children quality and quantity based on decisions made by Iranian households. The reason for this investigation is high speed of changes in fertility rate in Iran according to the proposed indexes. As mentioned, since current work aims at investigating investment in children's human capital, households with children below 30 were investigated.

Regression proposed by Hahn and Park (2008) is as follows:

This model is estimated cross-sectional in which Leduexch is logarithm of children spending per capita for education by household I, N is children quantity in household i, and X is vector of explanatory variables related to household i. Explanatory variables include average children age and its square, the number of education years of household head, household head gender, and net income logarithm. Average children age and its square is added to consider different between education spending in terms of grades, because it is expected education spending per capita is in U shape and it shows educational spending increased incrementally by progress of children to higher educational levels. It is expected parents' educational level has positive impact on average educational spending of children. The reason for considering household head gender is probability for higher emphasis put by women than men on children education.

If price of one unit of education quality is identical for all households, negative sign supports children quality and quantity interaction hypothesis in Iran. It should be noted total spending for children education (tot -  $ex_i$ ) includes three parts: education quality  $q_i$ , price of one unit of education quality  $p_{q_i}$  and number of children  $N_i$ .

$$tot - ex_i = p_q \times q_i \times N_i$$



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Thus,

$$Leduexch_i = ln$$

Therefore,

$$\alpha = \frac{\delta(\text{Lodusnoh})}{\delta N_i}$$

To this end, all problems of estimated relationship is that the main independent variable suffers endogenous error. Key assumption in theoretical literature is that fertility results from deliberate selection of the family and decision making on fertility cannot be considered as separate from decision making for investment in human capital. In other words, the children quantity is specified by dependent variable, i.e. quality of education. Thus, orthogonally conditions for maintaining consistent ordinary least squares estimators are not met. To cope with this problem, appropriate tools for GMM estimation should be used. To this end, two instrumental variables are used including dummy variable for the gender of first child and mother's age. Because there are yet beliefs promoting sensitivity to children gender in the current population, especially in rural areas. Regarding the second instrumental variable, considering increasing marriage age and complications and risks of child-bearing in ages above 35 for mothers, increased age of mother probably leads to reduction in children quantity. Results of OLS and GMM are presented in this section in order to compare.

The proposed model was also estimated considering dependent variable as one minus average years that children did not educate versus average age of children (Nlyavr) as human capital measurement index. Because not only endogenous issue is somehow solved by this variable, but also nature of educational spending in Iran indicate educational spending are not increased only given the education quality, rather other factors also influence in educational spending. For example, presence of non-governmental schools causes significant difference in educational spending of two different areas with the same educational quality. Educational spending is a function of the province and educational region in these schools.

### **Construction Criterion and Estimating Experimental Model**

Indexes for measurement of demographic transition speed are introduced and calculated in this section. It is done according to the study by Hahn and Park (2008) in some East South Asian countries, and it will be shown Iran experiences quicker demographic transition compared to other countries in the region. To this end, three criteria were introduced to measure demographic transition speed. Estimation of a criterion for measurement of demographic transition speed was done assuming fixed demographic transition speed. To this end, three different demographic indexes were used and demographic transition speed was measured based on each index. These indexes include: fertility rate, working age population and population growth rate. Each index was calculated through regressing demographic indexes on fixed part and time periods during 1961 – 2012.

It should be noted index making for demographic transition speed of a country for a specific time period is possible only by assuming it as fixed. However, it should be considered that demographic indexes move on a non-linear pattern, not a linear pattern.

According to evidence, the pattern for population at working age in a country shifted to an inverse U shaped pattern from a non-linear pattern over the time. That is, the ratio of population at working age showed a moderate reduction in a short period of time, then it is increased and it is accompanied by reduction in fertility rate along with first stage



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of demographic transition. In the next stage, it reduces and finally it is diminished. Thus, linearity assumption may provide two different estimations for two countries with the same demographic transition speed, and it depended on the fact that the country is in which stage of transition. However, considering laminations in the criteria introduced for demographic transition, since most countries are in left part of inverse U (at least in the time period of current research), it seems linearity assumption is less problematic. Following table gives a summary of data related to estimated indexes of demographic transition speed. According to the obtained results, average speed estimated from changes in fertility rate in the countries under study was about 0.08, i.e. almost 12 years last so that fertility rate is reduced by 1 unit, i.e. from 3 to 1. Of course, it should be noted there are many differences among different countries considering SD of the introduced index (about 0.06). Average speed estimated from changes in fertility rate in Iran is about -0.125. That is, it last 8 years so that fertility rate decreases by 1 unit, i.e. from about 1.9 to 0.9. Average speed estimated for changes in population growth rate in the countries under study is about 0.038, that is, it last 26 years so that population growth rate decreases by 1 percent, i.e. from 2 percent to 1 percent. Considering SD of introduced index, there are many differences among different countries regarding this index (about 0.04). Average speed estimated for changes in population growth rate in Iran is about 0.04, that is, it last about 25 years so that population growth rates decreases by one unit, i.e. from 1.3 to 0.3. Average speed estimated for changes in working age population percentage in the countries under study is about 0.28. That is, it last 4 years so that working age population percentage is increased by 1 percent, i.e. from 67 to 68. There are many differences among different countries considering SD of the introduced index (about 0.12). Average speed estimated for changes in working age population in Iran is about 0.37. That is, it last about 3 years so that working age population rate increases by 1 unit, i.e. from about 71 to 72.

Following Libya and Algeria, Iran has the maximum speed of changes in the fertility rate, regardless of the direction of change. Minimum speed of changes in fertility rate is for Afghanistan among the countries under study.

Following table gives results for the first proposed cross-sectional model estimation to investigate children quality and quantity interaction using OLS and GMM estimators considering logarithm of children spending per capita by the household as criterion for household investment in children's human capital as dependent variable.

Results given in Table 1 indicate OLS estimator could not provide appropriate estimation of the influence of explanatory variables on dependent variable. J statistics shows reliability of used tools. Thus, results estimated by instrumental variable method and application of GMM estimator can be cited. Also, all estimated coefficients are significant at level 95 percent. According model coefficients estimated using OLS, if household's fertility decision is not considered as endogenous, it will lead to incorrect results concerning household behavioral reaction on investment in children's human capital toward increasing quantity of children.

As mentioned, the proposed model was also estimated considering dependent variable as one minus average years that children did not educate versus average age of children (Nlyavr) as human capital measurement index. Because not only endogenous issue is somehow solved by this variable, but also nature of educational spending in Iran indicate educational spending are not increased only given the education quality, rather other factors also influence in educational spending. In addition, educational spending is considered as spending of investment in human capital, while profit of part of this investment follows child's behavioral characteristics. In turn, these characteristics are function of such factors as family and environmental factors. Thus, influence of children quantity on the number of children education years as children's human capital is also investigated in this section. It should be noted all estimated coefficients are significant at 95 percent confidence level.



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### CONCLUSION AND RECOMMENDATIONS

Considering mentioned facts on demographic transition speed, Iran experiences high demographic transition speed compared to other countries in the region. In addition, according to prediction of UN, Iran's population is moving toward aging and this movement is very rapid according to the indexes proposed in this study to measure demographic transition speed. Thus, the system's demographic policies have shifted to increased population policy from population control policy. Hence, current work investigates influence of population on economic activities through household's reaction. As previous studies indicated, population influences economic activities through human capital, and if human capital increases by population increase, economic growth will increase too. In fact the main factor establishing relationship between demographic transition and economic performance is decisions made by households on children quality and quantity in reaction to change in human capital benefit rate.

Based in behavior of Iranian households, findings of this work indicate increased quantity of children does not lead to reduced household's investment in human capital. In other words, positive sign estimated for influence of children quantity on log of per capita children education spending indicates with higher child birth, the household does not react to educational spending though reduction of educational spending. It is because of wide coverage of free public educational facilities in the country. Also, it is because of effectiveness of past population control policies in prevention of unwanted pregnancies. In other words, the households decide on fertility considering costs of investment in children's human capital. Also, results indicate positive impact of education and income of household head on children's human capital investment at rural and urban level. According to the research findings, impact of household head's education and income on investment in children's human capital is more in urban areas than rural areas. Findings show households with female heads invest more in their children's human capital.

Results of second estimation model regarding influence of children quantity on the number of passed educational grades by children as children's human capital indicate difference in rural and urban areas. According findings of the second model, increased children quantity in urban areas leads to reaction of children's human capital, while it leads to increase of children's human capital in rural areas. Results also indicate increased per capita income in urban areas leads to reduction of the educational grades passed by the children, while it is not true about rural areas. It is because of uncertainty in young people about human capital benefit in urban areas. In addition, increased education of household head in urban areas leads to reduction of average education in children.

Considering notification of general demographic policies in the current year and according to findings in this work, increasing quantity of children in the household may not lead to reduction of household's investment in human capital. However, considering results of the second model and influence of environmental factors on benefits of such investment, especially in urban areas, benefit of this investment cannot be guaranteed. In other words, increased investment in human capital cannot guarantee human capital growth and thus improvement of national economic performance following population growth stimulation.

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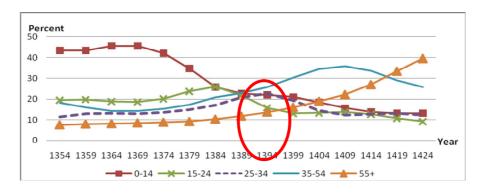


Figure 1: Age composition of the Iranian population (1975-2045)



### Maryam Shafiee Kakhki and Kambiz Hozhabr Kiani

# Table 1: results for the first proposed cross-sectional model estimation to investigate children quality and quantity interaction

	Urban		Rural	
Dependent variable: log of per capita education	GMM	OLS	GMM	OLS
spending				
Children quantity	0.033	-0.030	0.016	-0.010
average age of children	0.150	0.110	0.121	0.095
Square average age of children	-0.002	-0.002	-0.002	-0.001
Number of years of household head's education	0.060	0.050	0.045	0.039
Gender of household head	0.060	0.220	0.007	0.131
Log of net income	0.943	1.030	0.721	0.770
Number of observations	9380	9380	8695	8695
coefficient of determination (R2)	0.45	0.49	0.41	0.44
J-statistics	0.72	-	1.51	-

Table 2. the results of number of passed educational grades vs. average age of children

Dependent variable: number of passed educational grades vs. average age of children	Rural	Urban
Children quantity	0.007	-0.000
average age of children	0.001	0.004
Square average age of children	-0.000	-0.000
Number of years of household head's education	0.000	-0.006
Gender of household head	0.096	-0.044
Log of net income	0.24	-0.02
Number of observations	11897	11841
coefficient of determination (R2)	0.22	0.17



### RESEARCH ARTICLE

# Evaluation of the Quran Education Program from the Perspective of Educational Beneficiaries (Case Study: Elementary School of the Seventh District of Tehran)

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### **ABSTRACT**

This study investigates the evaluation of teaching Quran from the perspective of parents and teachers in elementary school of the seventh district of Tehran. The assessment was based on the approved evaluation system in Iran Educational System. In this evaluation system, three goals-groups of knowledge and information, emotions and attitudes, and practice and skills were considered in with respect to the Koranic education programs. This is a practical research in terms of objectives and descriptive in terms of approach. Statistical population of this study includes all teachers and parents of elementary school students in 50 schools of seventh district of Tehran. The numbers of parents and teachers in grades 4, 5, and 6 are 6700; according to Cochran formula, the sample size was determined n=250. Simple random sampling has two stages. In the first stage, the schools were selected; then, the teachers were selected based on cluster sampling methods and parents were selected based on two-stage stratified sampling method in the second phase. Field data was used in data collection. Data were gathered by a researcher made questionnaire. Cronbach's alpha coefficient was calculated  $\alpha$ = 0.916, indicating the reliability of the tool. In analyzing the data, descriptive statistics and measures of central tendency were used. In inferential statistics, the Kruskal-Wallis test, independent T and single sample T were employed. The results of this study indicate that the teaching of the Quran in this area is desirable. Although the results of teaching the Quran in the realms of attitudes and emotions and practice and skills



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are similar in both boys and girls' schools, parents evaluate more appropriately the subject in the realm of skills and practice according to obtained averages. In knowledge and information, the obtained averages indicate an appropriate condition in girls' schools.

Key words: evaluation, teaching the Quran, elementary school, education, Tehran.

#### INTRODUCTION

Quran, the clear message of God, invites all men to truth and salvation. From advent of Islam, this eternal message of God has been one of the most important goals of education among Muslims. In Iran, Due to the specific position of Islam in the Iranian culture and a special place of the Quran in religious beliefs, special attention should be paid on teaching Quran to prepare favorable conditions for achieving the goals of this course. Hence, the Quran course has a particular importance in various courses of study. A short look at the achievements of teaching Quran in Iran shows that the achievements are neither congruent with the importance and status of Quran in Islam nor with the amount of people's interest and attention to Quran. This could have several reasons including lack of clarity in the purposes of teaching Quran and explaining other elements and parts of the training such as determining the minor objectives of teaching steps, determining the principles governing teaching Quran, organizing reasonable contents, presenting proper methods for training Quran teachers, determining education system and producing necessary educational materials. In a word, Quran curriculum should have a paramount importance (Nabati, 2008). Since the evaluation is at the center of the educational process, it is obvious that the approaches for assessing the students' learning should be defined according to the educational goals and traditional methods that based largely on memory should be transformed. Continuous evaluation of the teaching - learning process seems quite necessary. The evaluation should be based on objectives, conditions and activities. This research tries to emphasize on the evaluation of programs teaching Quran in elementary schools in attitude, knowledge and skill terms. Assessment should be intertwined with learning process and its related activities, not to be limited to written and final formal tests. Therefore, an assessment should be made in the implementation of activities. However, teachers are accustomed to limit the evaluation to formal written examinations and they pay less attention to evaluation and investigation assisting learning process (Soleiman Neiad & Zare, 2010, p. 217). With the evaluation of Quran teaching programs from the perspective of education beneficiaries, this study presents a document to uncover various problems in current teaching Quran programs, recognize the strengths and weaknesses of teaching Quran programs in elementary schools, and push it in an evolutionary path.

## **Evaluation**

Evaluation is one of the pillars of any curriculum. As the students' knowledge and abilities are tested at the beginning of each course with diagnostic evaluation, the students' learning is assessed after each course and at the end of lessons. Evaluation is usually oral, written or practical and in two types of final or continuous; students' learnings are evaluated in three areas of knowledge, skills and attitude. Evaluation tests both the amount of students' learning and the amount of teachers' success. It depicts the strengths and weaknesses of teaching programs (Anosheh Pour, Sar Shoor Khorasani, Seif, Malakooti & Vakil, 2007, p. 84).

Many education specialists believe that learning occur when a learner can apply what he has learned in a different situation or when he has the ability to transfer the learned subject. In other words, the student reached metacognition (Rastegar, 2009, p. 142). We must always remember that the ultimate goal of teaching is to change students to a person who is able to evaluate himself when it is necessary. If students are dependent on others in identifying good and bad correcting problems in daily life after their graduation, all our educational categories are questioned because the supreme goals of education have lost. Perkins and Salmon (1992) emphasizes the need to inform students of their



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educational status and engage them in the metacognitive process; they define it as becoming aware of one's own thinking process at any time to control it. Barrel (1992) believes that researchers and educators insist on 'knowing' at the beginning of the process, but 'thinking' includes not only cognitive functions but also the ability to apply it at the right time. For a student to reach such ability, the education process should permanently ask for feedback and be aware of its status. The feedback can be acquired from teachers, the students, or the classmates (Rastegar, 2009, 154).

The best-known classification of educational goals developed by a group of experts in education, measurement and evaluation is known under the title of Benjamin Bloom who conducted the group (Bloom et al., 1956, p. 98). This categorization divides educational goals into three cognitive, affective and psychological groups.

#### **Cognitive Domain**

This domain includes goals needed mental activities and goals related to cognitive recalling and intellectual growth and development of abilities and skills. For the realization of these goals, the learner must remember an object, feel the existence of an issue, and solve the problem by adjustment or recombination the data and the use of ideas, principles and techniques learned from the past (Bloom et al. 1956). The objectives of cognitive domain relate to process like knowing, recognition, understanding, thinking, reasoning and judging. Cognitive domain is divided into two general groups of knowledge and intellectual abilities and skills; each area has classes of concrete, simple, abstract, and complex.

#### Intellectual abilities and skills

These objectives emphasize the mental processes of organization and organizational renewal of the learned contents that are necessary for a particular purpose. Intellectual activities and skills are composed of the following five categories:

- A) Knowledge: it includes remembering (recall and recognition) of affairs. In fact, knowledge is to repeat responses that have been taught and practiced in the recall.
- B) Comprehension: it is the ability to understand the purpose of a story. Understanding needs more responses than what has been learned and practiced.
- C) Application: it is the ability to employ abstract affairs, rules and regulations, principles and thoughts, and methods in practical situations.
- D) Analysis: it is the ability to break a story or subject into its components and elements.
- E) Synthesis: it is the ability to juxtapose elements and components to create a new pattern or structure. This stage emphasizes on the combination of parts to construct a whole and it is often associated with creativity.
- F) Evaluation: it is the ability to judge about quality and quantity of recall according to certain criteria.



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#### Affective Domain

This domain includes motives, feelings, values and attitudes, tendencies, emotions in reading and doing a physical activity, the willingness to take in a phenomenon, and respect for rules and regulations. Affective domain is related to interest, motivation and attitude. Affective domain is classified into five levels as follows (Kerat Hole et al, 1964):

- **1- Receiving:** Consciousness, desire for attention, sensitivity to the presence of some phenomenon and the environmental stimuli, and the desire to receive or pay attention to them.
- **2. Responding:** Non-opposition to respond, the desire and willingness to respond, attention to phenomenon or activity that is indicative of acceptance of an idea or policy.
- **3. Valuing:** Acceptance of a value, preferring a value to another value, commitment.
- **4. Organizing values:** Conceptualization of a value and organization of a value system; in other words, classification of values so that some of them seem more important.
- **5. Characterizing:** it is characterizing a value or set of values. To put it another way, this step involves generalized attitude and the combination of personality.

#### **Psychomotor Domain**

The goals of this domain are related to the activities and skills that are psychological as well as physical (Seif, 1997, p. 97). The objectives of psychomotor domain refers to skillful body movements and actions such as writing, typing, playing musical instruments, playing sports, doing a variety of jobs and professions that deal with both the physical and mental activity.

#### **Attempt Domain**

Recently, the attempt domain has been added to this taxonomy. This field is related to the asepcts of mental process, practice-oriented behavior, or changes that are associated with motivation and enthusiasm, determination and effort. In this domain, an individual's capability and personal power is guided purposefully and productively for valuable and driven things (Hylgard, 1980). Observing changes that have been occurred in learners helps to identify and develop teaching aims even if these aims may be completely different from what has been predicted. Doing so, one can search not only for the predicted results but also for unpredicted results. The positive or negative unexpected results are often ignored because evaluation efforts have been focused on pre-determined targets (Khorshidi & Malekshahi Rad, 2006, p. 80).

# **RESEARCH METHODOLOGY**

This research aims to collect data for making a conclusion about evaluation of teaching Quran in curriculum according to the ideas of education beneficiaries.

This is a practical research in terms of objectives and descriptive in terms of approach.

Statistical population of this study includes all teachers and parents of elementary school students in 50 schools of seventh district of Tehran. The numbers of parents and teachers in grades 4, 5, and 6 are 6700; according to Cochran



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formula, the sample size was determined n=250. Simple random sampling has two stages. In the first stage, the schools were selected; then, the teachers were selected based on cluster sampling methods and parents were selected based on two-stage stratified sampling method in the second phase. Field data was used in data collection. Data were gathered by a researcher made questionnaire. Cronbach's alpha coefficient was calculated  $\alpha$ = 0.916, indicating the reliability of the tool. Due to the situation, data gathering method is field study. Data collection tool in this study is a researcher made questionnaire consisting of 21 questions with Likret's 5-item.

#### **RESEARCH FINDINGS**

In order to evaluate teaching Quran programs from the perspective of education beneficiaries, 10 of 50 schools in the District 7 of Tehran were selected and some teachers and parents were selected randomly as following:

From 10 selected schools, five female schools and five male schools were considered; 121 samples were from female schools and 128 samples were from male schools.

From 249 sampled respondents, 99 persons were teacher and 150 persons were parents of students.

Four percent of the respondents are below the age of 31 years, 53.4 in the group between 31 to 40, 24.1 percent 41 to 50, and 4 percent higher than 50 years old. In addition, 14.5 percent of respondents did not state their age, which are mostly in the group if 31 to 40.

Five percent of the respondents have a diploma degree, 19.3 percent Associate degree, 34.1 percent BA degree, 7.2 percent MA degree, and 1.2 percent Ph.D. degree. Moreover, 5.6 percent of respondents did not state their education level.

Selected teachers' work experience is according to the table above. It can be seen that most of them have more than 15 years work experience

#### Inferential statistics:

#### 1 - The main question:

How is the evaluation of teaching Quran program in elementary schools of District 7 of Tehran from the perspective of education beneficiaries? In order to evaluate Quran education programs, the mean of collected data are compared with the constant value of 3 that is the mean of values allocated to questions. If the mean is greater than or equal to 3, the teaching Quran program is evaluated desirable, unless it is undesirable. To do this, we used one-sample T test.

#### One-sample T-test

H0: The average of the teaching Quran variable is equal to 3.

H1: The average of the teaching Quran variable is not equal to 3.

Given the achieved significant level (0.000) that is smaller than 0.05, null hypothesis is rejected and the value is opposite of 3. Since the upper limit and lower limit are both positive at the 95% confidence intervals, the value is greater than 3; therefore, teaching Quran programs in elementary schools of District 7 of Tehran is evaluated as desirable.



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#### T-independent for both the teachers and parents

In order to know whether the evaluation of teaching Quran programs for the teachers and parents are identical or not, T-independent test was used.

- H0: The mean of the evaluation of teaching Quran programs for the teachers and parents are identical.
- H1: The mean of the evaluation of teaching Quran programs for the teachers and parents are not identical.

Given the achieved significant level (0.51) that is greater than 0.05, null hypothesis is accepted. It indicates that teachers and parents agree that the teaching Quran programs in elementary schools are desirable.

#### T-independent for both the female schools and male schools

In order to know whether the evaluation of teaching Quran programs for female schools and male schools are identical or not, T-independent test was used.

- H0: The mean of the evaluation of teaching Quran programs for female schools and male schools are identical.
- H1: The mean of the evaluation of teaching Quran programs for female schools and male schools are not identical.

Given the achieved significant level (0.143) that is greater than 0.05, null hypothesis is accepted. It indicates that the teaching Quran programs in male and female elementary schools are desirable.

#### Kruskal-Wallis test to compare the schools in 10 districts

In order to know whether the evaluation of teaching Quran programs in different schools are identical or not, T-independent test was used.

- H0: The mean of the evaluation of teaching Quran programs in different schools are identical.
- H1: The mean of the evaluation of teaching Quran programs in different schools are not identical.

Given the achieved significant level (0.293) that is greater than 0.05, null hypothesis is accepted. It indicates that all subjects in different schools agree that teaching Quran programs in schools are desirable.

#### One-sample t-test

#### Knowledge

- H0: The average of the teaching Quran variable in knowledge domain is equal to 3.
- $\label{eq:H1:The} \textbf{H1:} \ \textbf{The average of the teaching Quran variable in knowledge domain is not equal to 3.}$

Given the achieved significant level (0.000) that is smaller than 0.05, null hypothesis is rejected and the variable value is not equal to 3. Since the upper limit and lower limit are both positive at the 95% confidence intervals, the value is



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greater than 3; therefore, teaching Quran programs in terms of knowledge in elementary schools of seventh district is desirable.

#### **Skills**

H0: The average of the teaching Quran variable in skills domain is equal to 3.

H1: The average of the teaching Quran variable in skills domain is not equal to 3.

Given the achieved significant level (0.000) that is smaller than 0.05, null hypothesis is rejected and the variable value is not equal to 3. Since the upper limit and lower limit are both positive at the 95% confidence intervals, the value is greater than 3; therefore, teaching Quran programs in terms of skills in elementary schools of seventh district is desirable.

#### **Attitudes**

H0: The average of the teaching Quran variable in attitudes domain is equal to 3.

H1: The average of the teaching Quran variable in attitudes domain is not equal to 3.

Given the achieved significant level (0.000) that is smaller than 0.05, null hypothesis is rejected and the variable value is not equal to 3. Since the upper limit and lower limit are both positive at the 95% confidence intervals, the value is greater than 3; therefore, teaching Quran programs in terms of attitudes in elementary schools of seventh district is desirable.

#### T-independent for both the teachers and parents

In order to know whether the evaluation of teaching Quran programs for the teachers and parents in different learning domains are identical or not, T-independent test was used.

H0: The mean of the evaluation of teaching Quran programs for the teachers and parents in different learning domains are identical.

H1: The mean of the evaluation of teaching Quran programs for the teachers and parents in different learning domains are not identical.

Given the achieved significant level in attitude domains that is greater than 0.05, null hypothesis is accepted. It indicates that the teaching Quran programs in attitude domains are desirable. Nevertheless, the achieved significant level for knowledge and skills are smaller than 0.05; it means teachers and parents did not agree in these domains. According to obtained means, parents evaluate it more desirable in both domains.

## T-independent for both the female schools and male schools

In order to know whether the evaluation of teaching Quran programs for female schools and male schools in different learning domains are identical or not, T-independent test was used.



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H0: The mean of the evaluation of teaching Quran programs for female schools and male schools in different learning domains are identical.

H1: The mean of the evaluation of teaching Quran programs for female schools and male schools in different learning domains are not identical.

Given the achieved significant level in attitude and skills domains that is greater than 0.05, null hypothesis is accepted. It indicates that the teaching Quran programs in attitude and skills domains in male and female schools are desirable. Nevertheless, the achieved significant level for knowledge is smaller than 0.05; it means male and female schools are not identical in this domain and female schools are more desirable in this domains.

#### Kruskal-Wallis test to compare the schools in 10 districts

In order to know whether the evaluation of teaching Quran programs in the three domains in different schools are identical or not, T-independent test was used.

H0: The mean of the evaluation of teaching Quran programs in the three domains in different schools are identical.

H1: The mean of the evaluation of teaching Quran programs in the three domains in different schools are not identical.

Given the achieved significant level in attitude and skills domains that is greater than 0.05, null hypothesis is accepted. It indicates that the teaching Quran programs in attitude and skills domains all schools are desirable. Nevertheless, the obtained significant level for knowledge is smaller than 0.05; it means different schools are not identical. The schools can be divided into two groups according to the below table; the evaluation of teaching Quran programs in the second group showed more desirable results.

## **DISCUSSION AND CONCLUSION**

A review of available sources shows there is not a comprehensive research that exactly matches the study of teaching Quran in elementary schools. However, some researches that were partly related to the project were studied.

#### The result of the main question:

Evaluation of teaching Quran programs in elementary schools from the perspective of education beneficiaries is in line with the results of a research by Abbas Homan titled "Comprehensive evaluation of the pilot implementation of teaching Quran at first and second grades in the year 78-79", the study by Ahmad Zahedi titled "Studying the effective factors in the success of students in Quran course in fifth grade students in Mashhad in 1998", the study conducted by the Directorate General of Education in Tehran in 1994 titled "Evaluation of teaching Quran at third grade of elementary school", Nabati's title "Reviewing the process of teaching Quran during 1357-85" as well as Arghavani's research titled "Reviewing the process of teaching Quran in elementary schools during 1369-89".



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#### The result of the first question:

The evaluation of teaching Quran in the knowledge domain from the perspective of education beneficiaries are consistent with the results obtained in Homan's research "Evaluation of Quran education program at grades one and two in all elementary schools in the year 1378-79." It is also in accordance with Manochehri's title "Studying the problems and reasons for lack of achieving the goals of teaching Quran in Hamadan." It is also consistent with Zahedi's research "Studying the effective factors in the success of students in Quran course in fifth grade students in Mashhad in 1998" and the Education department of Tehran "Studying teaching Quran at third grade."

#### The result of the second question:

The evaluation of teaching Quran in the skills and action domain from the perspective of education beneficiaries in elementary schools is in line with Akhavan's "Learning Quran in students of fifth grade in Tehran." It is consistent with the study conducted by Arghavan and Nabati's title "Reviewing the process of teaching Quran during 1357-85". It is also in line with Homan's research "The evaluation of teaching Quran in first and second grades in Iran"

#### The result of the second question:

The evaluation of teaching Quran in affective domain from the perspective of education beneficiaries in elementary schools is in line with the study titled as "The status of teaching Quran in third elementary grade" conducted by the Directorate General of Education in Tehran in 1994. It is consistent with Homan's title "Comprehensive evaluation of the pilot implementation of teaching Quran at first and second grades in the year 78-79",

#### Research recommendations

- 1- The goals of teaching Quran in each grade should be taken into consideration and due to the teaching should be carried out with respect to the priorities of each of the objectives.
- 2- Intimacy and permanent relationship with the Quran Should be considered seriously as the main aim of teaching because the teachers and schools activities have not been so successful in providing practical solutions and practices to attract students.
- 3- We should pay attention to the differences between learning skills and learning rules in teaching Quran. The common methods of teaching Quran in Iran is based on learning rules while learning skills method governs the successful sessions, traditional and authentic methods.
- 4- Teachers should read carefully the initial pages of students' books that tells some words about reading Quran.
- 5- Using the real text of Quran in teaching how to read Quran is preferred due to the approved goals.
- 6- Evaluation of Quran lessons should be carried out during an educational year to allow students to learn with peace and love.
- 7- For first and second grades, it is better to use games and entertainment with education to create enthusiasm and interest in the student.



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8- It is better to hold regular meetings of family education on teaching Quran; parents of each class are invited separately.

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Table 1: studied schools

		Frequency	Frequency percentage	Cumulative frequency percent
1	Shahid Sedaghat Female Elementary School	27	10.8	10.8
2	Shahid Ali Gol Female Elementary School	22	8.8	19.7
3	Shohadaye Azadi Female Elementary School	23	9.2	28.9
4	Hazrat Zeinab Female Elementary School	27	10.8	39.8
5	Payam Enghelab Female Elementary School	22	8.8	48.6
6	Moalem Male Elementary School	37	14.9	63.5
7	Shahid Vaseghi Male Elementary School	28	11.2	74.7
8	Shahid Korke Abadi Male Elementary School	21	8.4	83.1
9	Shar Tash Male Elementary School	21	8.4	91.6
10	22 Bahman Male Elementary School	21	8.4	100.0
	Total	249	100.0	



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Table 2: Type of schools

		Frequency	Frequency percentage	Cumulative frequency percent
1	Female	121	48.6	48.6
2	Male	128	51.4	100.0
	Total	249	100.0	

# The respondents

		Frequency	Frequency percentage	Cumulative frequency percent
1	Teachers	99	39.8	39.8
2	Parents	150	60.2	100.0
	Total	249	100.0	

# Age of respondents

	Frequency	Frequency percentage	Cumulative frequency percent
<30	10	4.0	4
31-40	133	53.4	57.4
41-50	60	24.1	81.5
>51	10	4.0	85.5
Missing data	36	14.5	100
Total	249	100.0	

# Respondents' Education level

	Frequency	Frequency	Cumulative frequency
		percentage	percent
Diploma	81	32.5	32.5
Associate Degree	48	19.3	51.8
BA	85	34.1	85.9
MA	18	7.2	93.1
Ph.D.	3	1.2	94.3
Missing data	14	5.6	100
Total	249	100.0	



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# Teachers' Experience

	Frequency	Frequency percentage	Cumulative frequency percent
1-5	4	4.2	4.2
5-10	4	4.2	8.4
10-15	9	9.5	17.9
>15	78	82.1	100.0
Total	95	100.0	

		Test Value = 3				
	Т	Degrees of	Significant level	Mean difference		dence rval
		freedom		from 3	Lower limit	Upper Iimit
Teaching Quran	14.851	248	.000	.56244	.4878	.6370

	Societies	N	Mean	Standard deviation	Deviation of the mean
Teaching	Teachers	99	3.4714	.58958	.05926
Quran	Parents	150	3.6225	.59724	.04876

	Independent Samples Test					
	Т	Degrees	Degrees Significant Mean			ce interval
		of	level	difference	Lower	Upper
		freedom		from 3	limit	limit
Teaching Quran	-1.965	247	.051	15116	30271	.00039

	Societies	N	Mean	Standard deviation	Deviation of the mean
Teaching	Female	121	3.6198	.65153	.05923
Quran	Male	128	3.5082	.53875	.04762



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	Independent Samples Test					
	Т	Degrees of	Significant	Mean	Confidence	ce interval
		freedom	level	difference	Lower	Upper
				from 3	limit	limit
Teaching Quran	1.469	233.204	.143	.11165	03808	.26138

Variable	Teaching Quran
The chi-square statistic	10.747
Degrees of freedom	9
Significant level	.293

one-sample t-test						
		T value= 3				
	Т	Degrees	Significant	Mean	Confi	dence
		of level difference interval				
		freedom		from 3	Lower	Upper
					limit	limit
Knowledge	12.412	248	.000	.50545	.4252	.5857

one-sample t-test						
	T value=3					
	Т	Degrees	Significant	Mean	Confidence	ce interval
		of	level	difference	Lower	Upper
		freedom		from 3	limit	limit
Skills	11.195	248	.000	.50430	.4156	.5930

one-sample t-test						
	T value=3					
	Т	Degrees	Significant	Mean	Confidence	ce interval
		of	level	difference	Lower	Upper
		freedom		from 3	limit	limit
Skills	16.229	248	.000	.71256	.6261	.7990



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	Societies	N	Mean	Standard Deviation	Deviation of the mean
Knowledge	Teachers	99	3.2900	.67485	.06782
	Parents	150	3.6476	.58015	.04737
Attitudes	Teachers	99	3.7186	.64712	.06504
	Parents	150	3.7086	.72350	.05907
Skills	Teachers	99	3.3896	.68961	.06931
	Parents	150	3.5800	.71672	.05852

Test for equality	Т	Degrees of	Significant level	Mean difference	Confidence interval	
two means		freedom			Lower	Upper
					limit	limit
Knowledge	-4.458	247	.000	35758	51557	19959
Attitudes	.112	247	.911	.01004	16701	.18710
Skills	-2.082	247	.038	19039	37047	01030

	Societies	N	Mean	Standard Deviation	Deviation of the mean
Knowledge	Female	121	3.6151	.62999	.05727
	Male	128	3.4018	.63957	.05653
Attitudes	Female	121	3.7391	.73486	.06681
	Male	128	3.6875	.65250	.05767
Skills	Female	121	3.5773	.77644	.07059
	Male	128	3.4353	.63809	.05640

Test for equality two	Т	Degrees of	Significant level	Mean difference	Confidence interval	
means		freedom			Lower	Upper
					limit	limit
Knowledge	2.650	247	.009	.21333	.05476	.37189
Attitudes	.586	.558	.05158	.01004	12167	.22483
Skills	1.572	232.567	.117	.14206	03595	.32007

Test Statistics <sup>a,b</sup>						
Knowledge Attitudes Skills						
The chi-square statistic	29.672	5.564	9.406			
Degrees of freedom	9	9	9			
Significant level	.000	.783	.401			



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Schools	N	Subset for alpha = 0.05		
		1	2	
Moalem Male Elementary School	37	3.1660		
Shahid Vaseghi Male Elementary School	28	3.2449		
Hazrat Zeinab Female Elementary School	27	3.4286		
22 Bahman Male Elementary School	21	3.4490		
Shahid Korke Abadi Male Elementary School	21	3.4830		
Shahid Sedaghat Female Elementary School	27		3.5767	
Shahid Ali Gol Female Elementary School	22		3.5909	
Shohadaye Azadi Female Elementary School	23		3.7391	
Payam Enghelab Female Elementary School	22		3.7857	
Shar Tash Male Elementary School	21		3.8980	
Significant level		.323	.194	



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#### **RESEARCH ARTICLE**

# Evaluation of the Failure of the Free Zones of the Iran Port Compared to Jebel Ali Free Zone and Offering Appropriate Solutions

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## **ABSTRACT**

The purpose of this research to find the cause of the failure or the free zones of Iran port compare to Jebel Ali Free Zone in UAE. Strategically Free zones of Iran located on the best known geographic areas of transportation and trade. Almost all free zones of Iran are in north - south or East - west corridors and they are in situations where expected at least have a place worthy of note in Transit. But, why Iran Free Zones not to say despite prone ore as of geographical and inherent potential of Islamic Republic of Iran? This study is descriptive and survey, and data collection tools are questionnaire and personal and telephone interview and librarian studies. This study started from autumn of 2014 and finished in winter of 2015 data collection done by questionnaire in free zones of port and other port. Statistical population were 101 people for this study and 50 people didn't complete their questionnaire and also 8 questionnaire were incomplete and unusable and 43 people as statistical samples included managers and free zones experts answered to send questionnaire. According to not to much number of accessible people, was decided to number of selected sample were equal to number of total population so, 100% of statistical sample means 101 were selected sample of this study and sampling has been purposive. According to condition of study and its data, used statistics in this study have the Pearson and Kolmogorov correlation coefficient. It should be noted that by use of Pearson coefficient 10 hypotheses examined in this study and Found that among all hypotheses and failure of free zones of Iran port there is a significant relation.

**Key words:** Iran free zones port, Jebel Ali Zone, Transportation, and Trade.



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#### INTRODUCTION

The purpose of creating free zones can be generally is outlined as: Economic growth and development, Doing accelerate in frastructure, construction and development, investment and increase public revenue, healthy and productive employment and labor and product market regulation,... all these aims are in basis of focus of export, transit and, again export and designed export processing and all of them should be done in a long – time process with stimulate private sector activities and foreign investment with government support. Unfortunately, wan free zone after many years of its activity have not significant growth and they are for away from designed aims for them. Generally, free zone have legal services and total principle of export and import provisions and creating of them is an action in order to remove barriers and business limitations.

In Iran there are 4 free zones port including:Qeshm , Kish , Anzali and chabahar . Qeshm ,kish and chabahar are located in south of Iran and Anzali is located on north . In addition to free zones port, Iran has 3 free zones other port that are:Aras ,Arvand and make that Aras and Arvand are Free zones river.

Jebel Ali Free zone is in UAE. The port of this zone is Jebel Ali that is located on 35 km of Dubai, and is the biggest port of Middle East and the 9<sup>th</sup> port of the world. This zone in 1985 is created and got the great prosperity to Jebel Ali port. Jebel Ali port has significant equipments and according to UAE programming till 2030 Jebel Ali acquire ability to unload 72 milion TEU (Twenty – Foot equivalent unit) in a year.

Also in Iran there are special economic zones that in terms of function have differences with Trade – Industrial Free Zones economic special zone defined as geographical limitation that customs rules don't apply in and in order to facilitate export and import and support of domestic industries and also absorb new technologies in manufacturing and development of zones in ports, customs and border points are created.

In free zones with creating facilities such as various cats , try to absorbance of foreign investment or in other words exchange into the country , and use it to production of export goods because as long as the only currency is in the country , special event won't happen in terms of trade in the region , but when the facilities of zones absorb forigeon investment as much as possible , exchang enter the borders and consequently products producing in addition to export to main land export to out side of country is reinforced , and as a result , country will benefit from export such as employment and zones development.

#### **Problem statement**

Iran free zone either in edge of a large regional economy means Iran and advantages of this neighborhood and or placement in international geopolitics regions have special situation. But what is the main reasons of failure in these zones is investigated in this study. UAE is limited through land to Arabian desert .

In reality is not located on international transportation corridor . But how Jebel Ali free zone acquire very successful statistic in volume of foreign trade and this is investigated.

#### Importance of subject

Irans free zons port are located on the best geographical regions and almost all of them are located on south – north or East – west corridors but despite of this privileged location after 24 years of activities, are inactivate and have great distance from the established goals. These zones are special geographic reigions but contrast to this, is faild to achieve to its aims and didn't abtain significant success.



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In one hand, free zone such as Jebel Ali has not geographical situation of Irans free zone, but from the activity and volume turnover and foreign investment, ... was completely successful and has a special situation in the world. According to potential of Iran free zones port, this researcher in her thesis try to find weaknes of failure in free zones port.

Finding more causes of failure and stemming topic and offering solutions and their treatment can be useful to eliminate failure factors in implementation of them. Also with investigation of strength in Jebel Ali free zone and recognition of advanced factor in mentioned region can help Iran for reinforce and development of free zones.

#### A review of conducted research

In investigation of failure factors in free port compared to Jebel Ali free zone and offering appropriate solutions, there is not any coherent research in home. This study is done for the first time in this field.

SoleimaniSedehi (2014) in his research, investigate location UAE and Turkey countries commercially and considered some of the index in their progress.

Alsafi (2013) in his book by title development of sea – based considered some of characteristics and progress factors of Jebel Ali Free zone by review world marine industry. Moqadasi (2010) in his research investigate principles, concepts, functions and solution in free zones and also indicate to total principles of export and import regulation in free zones.

Brojerdi in his research investigate some of the legal ssues in free zones and also considered some of factors in rein forcing of Dubai trade market.

KamaliArdakani of free zones and some of the probable results of how free zone function after joing world trad organization.

#### **HYPOTHESES**

Several hypotheses considerd in factors of Iran failure in free zones port compared to Jebel Ali free zone in UAE:

Lack of appropriate field for foreign investment is related to failure of free zones port of Iran.

Lack of equpied and effective ports in free zones port is one of the failure reasons.

Lack of infrastructure for utilizing different methods of transportation is related to failure of Iran.

Lack of effective airports is one of the reason of blight in zones (air ports with out significant international flights and also failure to provide appropriate services for transportation to mainland and abroad).

Lack of progress in suitable update technology compared to successful . Free zones port of world is another reason of failure.

Lack of cheap and established laws for facilitating affairs is a barrier for entering exchange to border of country.



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Lack of stability and economic security lack of guaranteed investment.

#### **Purposes**

Main aims: 1. Investigation of failure factors in free zones port of Iran.

2. Finding of success factors in Jeble Ali.

#### Theoretical

Generally Free zone is certain territory of main land that is not included some of the regulation of the country and by some cases such as accelerate export and import by Foreign investment and transmition of technology, deductibility, lack of transport customs formalities and complex regulation, interest relief and duties help to development of main land and its region.

Free zones organization in Iran , according to low on the administration of the free trade zones industrial with purpose of acceleration in doing infrastructure affairs , construction and development growth and economic development and increase of public revenue , create employment , market regulation for job and good , active participation in global market and provide suitable way for development and economic boom and transmition of this development to around the country.

Creation of free zones in Iran back to before the Islamic revolution in march 1971 a rule by title "The exemption from customs duties of goods that in order to use, consume and sell import to some of the Persian Gulf islands" is approved for the first time that let government to establish free trade zone.

After revolution in 1990, 1991 and 1992 under the law the first development plan after revolution 3 zones of kish, Qeshm and chbahr in traduced as free trade zones formally. Of course these zone are established while how to manage free zone rule is not approvel till 1994. After years of Islamic revolution 7 free trade zones are established that are: Kish, Qeshm, Chabahar, Arvand, Aras, and Znzali, and also make in 15 July 2010 connected to free zones of Iran with the approval of parliament. For better understanding of free zones function in the world it is better to compare them with free zones of Iran.

Free trade – industry zones in developing country have remarkable boom and many economic analysis believe that increase appetite of developing countries to spread and raise of free trade zones in that these countries knows free zones as least painful and simplest solution for problems related to domestic economic growth and lack of coordination with international economy , In other words free zones for most of these countries is a political and strategic to for achieving economic strategies .

In foreign free zones at first the dominant policy was development of trade , but after successful experience of some countries such as china , Irland , and some south – east countries of Asia in development of re-export and development of industries by these zone , development of trade gave its place to industry – trade development .

In generally can categorize lack of suitable function of free zones in the world as:

Wrong location

Unfavorable environment for attracting foreign investment



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Lack of stability in policy and weakness of central power in main decisions making.

Weakness of management in free zone (existing of bureaucracy, corruption, employee inflation, undue interference of external factors in free zone, existing of ineffective regulation,...)

Shortage of labor and little efficiency of man power (cost of labor)

Infrastructure of establish cost and inappropriate investment.

Weakness of conservation for installation and infrastructure equipment and unefficiency of operation.

Lack of cash and financial facilities.

Lack of communication and service weakness.

Lack of attention to this point that foreign investment is lack of nationality and if feel unsecunty leave the free zone and transform to a more secure place.

In Iran for each free zone on basis of their capabilities and facilities, special missions are defined and we mentioned the most important of them.

Chabahar free zone with good transit mission, regional trade and convert to dock goods and ingredients with out having any certain rule was established in 1991. This zone is the most secure shortest and cheapest place of transit and re – transportation from international sea to central Asia and Caucasus . According to lack of stability in Afghanestan and pakestan, chabahar some how is the only accessible way of these countries to seas. In Qeshm , the central mission of the fuel supply and ancillary services , large industries related to oil and gas , biological technologies engineering services , national Geo park and re export of goods.

Kish free zone also in Tourism background , focus of cultural and recreational services, advanced industries , IT , create a stock trading service and centered find in exhibition and conference field (international and regional) play a role .

Free zone of Iran in general are located in the best geographical area and almost all of them are in north – south or East –west corridors , but despite placement in these geographical situation they have not effective function on growth and economic development of country and contrast to them Jebel Ali free zone even though has not a situation like free zones of Iran , but could has a great growth from the beginning of his career sofar and considered as the best free zone in middle East.

Creation of free zones is for attraction of target makets of neighbor countries for export and production according to import goods. Development of export is one of the main components of creation free zones in countries that one of the strategies for industrial development. After frustrations of developing countries from import substitution policy ,encnouraging to export can bring economic development as a policy , so it is proposed by institutions such as united nations industrial development organization. The important point is that as in heart of import substitution policy was support of emerging industry , in the hearth of export development policy was creation of productive free trade zones and claimed that if these zones are created, cause atteraction of foreign investment in these zones and consequently new technology new jobs and export capability are obtained and then cause industrial development of country so free trade zones were noted.



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#### Minimal facilities for establishing free zones are

Create water fronts where ships can dock them at least up to 25000 tons and loading.

Create appropriate enclosures for docking and also establishment equipments in ports (crane , Forkliftsand transiting).

Create appropriate ware houses in port and provide water, light and fuel in the region

Create or development of airport and building of appropriate terminals.

Create educational centers, hospitals and service companies,...

Permission is granted landing of air liners departing from outside the region

Establishment of advanced telecommunication networks (telephon. Fax, telefax, ...)

Today, situation of UAF upgrade as a commercial, commerce and logistic hub in middle east. UAE despite having only 4 countries as land border countries or marine ones, today is pioneer in trade service offering and also in financial and logistic services, and convert it to as a regional trade hub and also international one as a connector between east and west world. AS reports showed, UAE income from logistic market up to end of 2014 is about 10 billion dollars, while in 2010 total income of its logistic market was a bout 7 billion dollars.

For understanding of severely retarded of free zones of country it is just enough to compared amount of foreign invest mentatteraction in Jebel Ali free zone in UAE (one of the 6 main free zones in UAE) since was 160 bilion dollars from 2009 with total forieng investment attracted by all Irans free zone that up to 2009 was 2 bilion dollars (monthly economic ,social , cultural free zone , number 229 , march 2014 and April 2014).

#### Methodology

#### Research

From categorization of research according to kind of data collection, this research is descript live and survey and describe statistical population features include nature of conditions, relation and the relation between them. (sarmad and collegous 2002) survey data collection was on plan and was done as a practical guidance for survey in wide scale and was contrast to experiment and its aims were concentrated on small scale.

#### Community and sample

The sample of this study was a team with 43 people of managers and free zone experts. Explaining that the sample were 101 people and 50 questionnaire not returned and 8 questionnaire returned incompletely and unusable.

Senior manager 2people

Supervisor 18 people



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Middle managers 3 people

Expert 18 people

Director of operations 2 people

#### Credit research tool

Tool used in this study were questionnaire, telephon and personal interview and librarian studies. For ensuring rational design of questionnaire, number of experts complete it in several level and in this regard remove part of structural and conceptual bugs of questionnaire questions designed clear, purposeful and certain and designed in such a way that the answers were not predictable.

#### check the reliability of questionnaire

It is one of the technical features of measuring tools. This concept is a bout that measuring tool in same situation how much obtained similar results. One of the definition for offered reliability is for Abel and Ferisbi (1989): "correlation between a set of scores and another one in equivalent test that is obtained independently for one group of test."

According to this point usually reliability coefficients range from zero (disaffiliation) to +1 (full communication) reliability coefficient shows how measuring tool measure stable feature test or variable and temporal features. For calculation of measuring tools of reliability coefficient different methods are used one of them is cronbachs Alpha that is explained as .

Chronbach's Alpha for measuring of questionnaire reliability:

This method is for coordinate calculation of measuring tool such as questionnaire or examinations that measure different features. In this type of tools answer of each question can be numerical values. For calculation of chronbachs Alpha at first should calculate scores variance of each question collection in questionnaire and then calculate total variance. Then value of Alpha coefficient is calculated by use of follow formula:

$$r_a - \frac{j}{j+1} \left( 1 - \frac{\sum S_j^2}{S^2} \right)$$

Where J= number of set of test questions,  $\mathbf{S}_{\mathbf{J}}^{2}$  = variance test,  $s^{2}$  = total test variance. The coefficient of zero indicates a lock of reliability and +1 indicate complete reliability. (Reference :Sarmad and college us 2002).

Now questionnaire reliability of this study is investigated.

Since values of chronbachs Alpha coefficient are all above 0.7 and are in appropriate level, so questionnaire reliability is approved and acceptable conpeletly.



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#### Analysis software

In this study in order to collected data analysis ,sps (statistical package for social science) software was used.

#### sampling method

According to not significant number of people , made decision to number of selected sample be equal to total population number , so 100% of statistical population , means 101 people were. Selected for this study .

#### Data analysis and Findings

Offering of descriptive analysis of demographic variables.

39.5 percent of respondents were from Qeshm and 23.3% from Kish and 23.3% were from Anzali and 4.7% from Chabahar and 9.3% were from other free zones of Iran.

83.8 % of respondents were experts and supervisor , 4.7% were senior managers , 7% middle managers and 4.7% director of operations people with bachelors degree were 55.8% and the biggest respondents size group people who had MA degree 37.2% and PhD 7%.

People with 5 to 15 years experience 74.4% were the biggest sample zie, people with 16 to 20 years.

Experience 20.9% and people with more that 20 years experience 4.5%.

#### 1-4. Check functional weaknesses in Qeshm

In the following table, the functional weaknesses in Qeshm is presented:

According to average rating in above table characterized that offered weaknesses have similar intensity in the region, cases such as inability region as a logistic hub, air distribution hub and ground distribution hub shows not identified and inability of region or lack of necessary facilities in the region. In part of manresource, lack of skillful manpower is one of the weakness of the region such as other freezones inability to absorb foreign investment and participation of large companies is see in Qeshm.

## 2-4. Cheek free zones weak nesses

## 3-4. Check the strengths of Jebel Ali free zone in comparison to Iran free zones

In the following table the strengths of Jebel Ali compared to Iran free zones

#### 4-4. evaluation of proposed solutions to resolve the weaknesses of the free zones

In the following table some of the proposed solutions to resolve the weaknesses of the free zones are investigated.



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#### DISCUSSION AND RESULTS AND RECOMMENDATIONS

The aim of this study is recognizing reasons of failure in Irans free zones compared to Jeble Ali free zone in OAE. Also offering some recommendations and appropriate and appropriate solutions for remove the mentioned reasons.

The importance and necessity of this study is that according to geographical coordinates of Iran free zones and compared to geographical coprdinate of Jebel Ali free zone, our free zones couldn't for some reasons playtheir role properly in economic development of country. In this study according to failure of these area, related reasons were investigated, and according to considerable progress of Jebel Ali, successful reasons of mentioned area were considered, and comparison between coordination's and activities of this area and Irans free zone ports some results are obtained. Also according to expectations of free zones ports these regions couldn't materialize expectations and amount of current actives of these area are considered and strengths of Jebel Ali free zone and weaknesses of free zones in Iran were identified statistical population in this study were experts and managers of free zones and accessible number of people for questionnaire distribution were 101 people and 43 people complete the questionnaire as a sample and 8 questionnaire returned incomplete and 50 people did not complete the questionnaire 43 people include senior, middle managers and directors of operation and also responsible expert and free zones expert and they were active in different areas of operation and they had enough experience to answer the questions.

Since categorization of research were basis on collecting data, this study is descriptive and is type of survey and used tool in this study were questionnaire, person and telephone interview and librarian studies. According to not significant number of people, were decided to number of selected sample be similar to total number of population, so 100% of statistical population means 101 people were selected as selected sample. For analyzing of data SPSS software and descriptive statistics were used.

In relation to Qeshm that has more details, according to obtained results of this investigation it is comparison to Jebel Ali There are fundamental weakness in Qeshm of Facility and infrastructure and Jebel Ali as a logistic hub and different methods of transportation IF Qeshm because of its infrastructure weaknesses don't have these facilities and couldn't play it's role as a regional hub even in one field. According to this study and briefly some of the failure reasons of Iran free zones compared to Jebel Ali are as follows.

Management problems (lack of management look on basis of specialty, programming , commitment , truth and sympathy and non – stability of management)

Lack of financial and eredit resource and weakness in attraction of it in inside and broad and broad of the country .

Heterogeneous policy of government in handling of free zones.

Lack of appropriate infrastructure security.

Lack of skilled vision to regions from government .

Lack of presentation of guideline (such as perspective document in 1404)

Limitation and contradictions in legislation

Lack of attention to main aims of regions and attention to rutine problems and marginal ones in free zones.



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Lack of native employment and familiar ones to free zones and existing of native privation in terms of living.

Lack of appropriate marketing for attraction of private and foreign investors .

Weakness in notification and advertisement for using different opportunities in free zones.

Lack of infrastructure facilities for having all transportation methods.

Lack of specialist and effective labor in zones.

Lack of Continuous government support from zones purposes.

Lack of investment guarantee in zone for Businesses.

Weakness in abroad export and in main land that is one of the impotent pillar of free trade zone activities.

Luxury goods import very much and unsuitable import if intermediate and raw good.

Absence of production-oriented of zone.

Lack of suitable and update technologies.

Existing of smuggling of good and economic mafia in zones.

Some of the approaches for resolving of weaknesses from free zone are as Follows:

Supportive government vision along with stability and continuity.

Establishment and selection of stable native management according to meritocracy in all levels according to quality management standards.

Employment and use of senior manager and specialist and native labor and remove of non native manager from staff system (in this way because of existing of native power sympathy, commitment and more speed in achieving goals ).

Creating easiness in arrivals and departures, employment and specialist accommodation (encourager of domestic and foreign specialists presence in all courses and creating of facilities for continuous presence of them with their families in each zone).

Control of in flat ion effects in creating free zones in region native lives.

Offering the required guarantees for domestic and foreign investors for investment and establishment.

Offering infrastructure facilities by government for investment.

Prevention of administrative red tape and remove of cumbersome rules.



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Continuous communication and report to people of each zone for use of public participation in developing programs.

Coordination and cooperation of 3 branch in development and of free zones port.

Prevention ofheterogenic decision in establishment and govern and selection of managers in free zone port by main custodians.

Serious supervision and strong one on manager and employee performance by monitoring devices for enhancing quality and performance in zone and prevention of bribery.

Transparency of transactions and bids and tenders in all free zone port by online electronic IT.

Granting tax deductibility for domestic and foreign investors and business and industry owners

Wide programming for simplifying for rules and revision of existing rules and updating them.

Providing and implementation of marketing comprehensive designs and note to implementation of if in all region.

Enhance of cultural, knowledge and economic speciality levels of people.

Carrying out scientific research and compare to competitor free zone and also reform and use of similar methods .

Reconstruction, organizing and redefined of problems and situation.

Specialist vision , integrated and purposeful one along with international vision to development of existing free zones .

Branding for domestic production and special introduction of it in free zones.

Permenant exhibition and specialist one in all free zones in order to support domestic industries productions that are competitive to foreign samples.

Note to native living people situation and increase of their welfare for prevention of smuggling in these zone.

All of these were brief review on failure reasons of Iran free zones port in achieving to purposes of these zone and presentation of approaches in this field certainly the results of this part were not obtained if serious determination and target full and away from margin of the internal in this field, will realize their noble objective by a global vision on governing of this regions.

## Thanks and appreciation

Endless thank god to that create human and he give him power of thinking and potential capabilities and commanded him to try and send some guidance for them. After sincerely humbly to God, it is necessary to tanks professors DrAmraie and Mr. Talebizade that with their compassionate guidance and I was blessed and also other trailer in this way I thank them and I wish all of them success from God.



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Table 1-3: questionnaire reliability

The reliability stat		
Number of questions  Statistics exam of chronbach's  Alpha		
0.82	50	Importance index
0.78	50	function index

Table 1-4: functional weaknesses in Qeshm

	Index	Average rating
	Infrastructure facilities	13.09
	Poor absorbtion of foreign investment	13.09
	Non – Aboriginal deprivation	13.09
	Weak exports abroad	13.09
	Shortage of skilled manpower	13.09
Weakness	Lack of international university	13.09
	Poor participation of successful companies invest in the world	13.09
	Inability region as a logistic hub	13.09
	Inability region as air distribution hub	13.09
	Inability region as ground distribution hub	13.09

Table 2-4. Iran Free zones weaknesses

Weakness	Frequency
Neglect the main objectives and attention to every day problems	18.5
Lack of appropriate legislation , including tax	12.5
Lack of independent and efficient management	12.5
Lack of management stability	10.5
Two management in the region (Qeshm)	8
Lack of employment of native and familiar people with the area	8
Lack of insurance due to lack of insurance agency (kish)	7
Retardation arising from the imposed war (Arvand)	7



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Lack of appropriate infrastructure	5
Lack of appropriate marketing in order to attract private investor and forigen investors.	5
Lack of simplifying rules	4
Despite of hot weather and polluted to a kind that can absorb tourism just in 2 months of a year (Arvand)	2
Total	100

Table 3-4: The strengths of Jebel Ali compared to Iran free zones

Mentioned cases	Frequency
Having the proper infrastructure	15
Guaranteed investment	12.5
The large number of economically active enterprises in the region	12.5
Increased development of ports and docks	10
Support companies and invest in port	10
Strong support from the government	10
Use of powerful management	5
Use of investment advisors	5
Considering the free trade zone authority	5
Welcoming to foreign investment	5
Facilitate the registration and operation of companies	5
Fast and timely expeditious insuance of visa to foreign nationals	5
Total	100

# . Table 4-4: proposed solutions to resolve the weaknesses of the zones

Mentioned cases	Frequency
Granting tax exemption	27
Wide programming for facilitating legislations	19
Government support	17
Establish appropriate area for attracting private and foreign investors	10
Development and implementation of a comprehensive marketing plan	8
Promoting cultural, knowledge and economic and commercial expertise	7
level in the region	
Eliminated privation of war (Aravand Free zone)	4
Modification and comparison to competitor port and use of similar	4
methods	
Reconstruction, organizing and redefined of situation and problems	2
Expert view to the area	2
Total	100



#### RESEARCH ARTICLE

# Qualitative Distribution of Phytoplankton along the Salinity Gradient from River - Ocean Continuum, Southwest Coast of India.

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#### **ABSTRACT**

Qualitative distribution of phytoplankton was studied along the salinity gradient from river (Nethravati) through estuary (Nethravati) to coastal waters (off Mangalore) for a period of 16 months from October 2012 to January 2014. Salinity varied from 0.03 psu to 0.51 psu in riverine waters, whereas in tidal influenced river waters, it ranged between 0.03 psu and 19.85 psu. In estuarine and coastal waters, it ranged from 0.04 to 34.59 psu and 9.12 to 35.30 psu respectively. Salinity appears to play an important role in the succession of phytoplankton along its gradient from river to ocean. A total of 106 genera belonging to five phytoplankton divisions viz., Chrysophyta (47), Cyanophyta (19), Chlorophyta (31), Rhodophyta (1) and Pyrophyta (8) were recorded during the study period.

**Key words**: Phytoplankton, Salinity, River, Estuary, Coastal waters.



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#### INTRODUCTION

Salinity is a dynamic indicator of the nature of the exchange system. It is the indicator of freshwater incursion into estuary and coastal waters during monsoon season and it has a profound influence in determining the composition and distribution of phytoplankton along its gradient by exerting osmotic stress on the plankton. The phytoplankton succession along the salinity gradient has generally been ascribed to the fact that most phytoplankton species are stenohaline and suffer osmotic stress upon exposure to salinity changes (Bisson and Kirst, 1995). Marine phytoplankton are adapted to high salinity and freshwater species to low salinity, some of them have evolved at an intermediate salinity (Devassy and Goes, 1988; Muylaertet al., 2009) or are resistant to salinity fluctuations and thus can survive in brackish (estuarine) waters.

Phytoplankton are major primary producers in the aquatic realm, from which the energy is transferred to higher organisms through food chain and are responsible for almost half of the global 'net primary production'. The density and diversity of phytoplankton are biological indicators for evaluating water quality and the degree of eutrophication. Phytoplankton serve as the base of pelagic food webs and play a major role in the global cycling of carbon, nitrogen, phosphorus and other elements and in the regulation of earth's climate. Their abundance and community structure in an ecosystem directly impact higher trophic levels and key biogeochemical cycles. It is an extremely diverse, polyphyletic group that includes both prokaryotic and eukaryotic forms. Several fundamental processes such as photosynthesis, growth, resource acquisition, and grazer avoidance to a large extent, define ecological niche of phytoplankton. The success of phytoplankton depends on how efficiently they acquire resources, transform them into growth, and avoid being eaten. Resource competition is one of the key ecological processes that control species composition, diversity, and succession of phytoplankton communities. Their abundance and distribution have important effects on carbon fixation rates and on transfer of energy in food webs. Phytoplankton communities are multifaceted in terms of their diversity and dynamics. As a source of organic carbon and energy for higher trophic levels, they ultimately determine the success of fisheries.

In general, tropical or subtropical assemblages display high species richness, with somewhat lower numerical abundances compared to temperate waters. Warm waters are also known to be less viscus than cold water, favouring species with a larger surface to volume ratio (Tunin-Ley et al., 2007). Phytoplankton are very susceptible to changes in the environment, and large variations in phytoplankton species composition are often a reflection of significant alteration in ambient conditions within an ecosystem. Continual documentation of phytoplankton dynamics, along with relevant environmental variables can offer important information on water quality changes. Such an approach can signal any drastic changes occurring within an aquatic ecosystem and also provide evidence to the causes of changes. Thus understanding of phytoplankton dynamics is central to the understanding of, how aquatic ecosystems work, and how they respond to environmental stresses imposed by natural and anthropogenic activities.

#### MATERIALS AND METHODS

A total of six stations were selected covering almost the whole salinity gradient from river to ocean continuum i.e. two stations along the Nethravati river, two in the Nethravati estuarine region and two stations in coastal waters of Arabian Sea, off Mangalore. The stations 1 and 2 representing freshwater ecosystem were fixed at Panemangalore (S<sub>1</sub>), Farangipet (S<sub>2</sub>) along the Nethravatiriver, of these S<sub>2</sub>istidal influenced river station. The stations 3 and 4 represents estuarine ecosystem, of these, station 3 (S<sub>3</sub>) represents upper stretch of the estuary (estuarine head region) at Adyar, whereas station 4 (S<sub>4</sub>) (Lat. 12°. 50¹. 747¹¹ North & Long. 74°. 49¹. 685¹¹ East av. depth 4.5 m) represents (estuarine mouth region) the confluent point of Nethravati river with the Arabian Sea. The station 5 (S<sub>5</sub>) (Lat. 12°. 50¹. 699¹¹ North & Long. 74°. 48¹. 940¹¹ East av. depth 7.0 m) and station 6 (S<sub>6</sub>) (Lat. 12°. 50¹. 605¹¹ North, Long. 74°. 47¹. 948¹¹ East av. depth 10.0 m) were fixed in the coastal waters, off Mangalore, representing coastal ocean ecosystem (Fig. 1).



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Sampling was carried out on monthly basis from all the sampling stations during the period from October 2012 to January 2014, but no collection could be made during southwest monsoon season (June – September) due to rough weather conditions of the sea at  $S_4$ ,  $S_5$  and  $S_6$  stations. Vertical haul of phytoplankton samples were collected using Heron-Trantorplankton net (60  $\mu$ m mesh size), samples were then preserved in 4% formalin for further analysis. The subsamples of plankton were used for identification to genera level by referring to the standard literature (Smith, 1950; Davis, 1955; Tomas, 1996; Bellinger and Sigee, 2010). For salinity analyses, surface water sample was collected using a clean plastic bucket whilst subsurface by using Nansen's reversing water sampler then were carried to the laboratory under low temperature (+4°C) in clean plastic bottles. The salinity was analysed using standard procedure (Strickland and Parsons, 1972), and expressed in psu.

#### **RESULTS AND DISCUSSION**

A total of 106 genera of phytoplankton belonging to five divisions viz., chrysophyta (47), chlorophyta (31), cyanophyta (19), pyrophyta (8) and rhodophyta (1) were recorded during the investigation period (Table 2).

The present investigation revealed the presence of a salinity gradient from riverine to estuarine and up to coastal waters. The monthly variations in the salinity during the investigation period are graphically represented in Fig. 3. The major groups (divisions) of phytoplankton encompassing the community structure of these stations is summarized in Table 1 and depicted graphically in Fig. 2. The phytoplankton genera encountered under each station along the salinity gradient is represented in Table 2.

The salinity of river water varied from 0.03 to 19.85 psu (at  $S_1$  varied from 0.03 psu to 0.51 psu, whilst at  $S_2$ , it varied from 0.03 psu to 19.85 psu). The community structure of phytoplankton was composed of four divisions of phytoplankton belonging to chrysophyta, cyanophyta, chlorophyta and rhodophyta. The dominant group was chlorophyta followed by chrysophyta and cyanophyta. Rhodophyta was ill represented, while pyrophyta was not encountered in the plankton collection.

In estuarine waters salinity ranged from 0.04 psu to 34.59 psu (at  $S_3$  varied from 0.04 to 25.62 psu, whereas at  $S_4$ , it varied from 4.87 to 34.59 psu). The community structure of phytoplankton was composed of five divisions of phytoplankton belonging to chrysophyta, cyanophyta, chlorophyta, rhodophyta and pyrophyta. The chrysophyta emerged as the dominant group followed by chlorophyta and cyanophyta. Rhodophyta was ill represented and recorded only in station 3 ( $S_3$ ), which is nearer to riverine zone, while pyrophyta was observed only in station 4 ( $S_4$ ), which is nearer to coastal water zone.

In coastal waters salinity fluctuated between 9.12 psu and 35.30 psu (at  $S_5$  it varied between 9.12 and 34.99 psu, while at  $S_6$  it fluctuated between 19.99 and 35.30 psu). The community structure of phytoplankton consisted of four divisions of phytoplankton belonging to chrysophyta, cyanophyta, chlorophyta and pyrophyta. The chrysophyta emerged as the only dominant group of phytoplankton, while cyanophyta and chlorophyta were ill represented. The pyrophyta were moderately represented in the coastal water zone.

From the above account, it can be ascertained that the chrysophyta appear to be the successful group established under varying levels of salinity gradient (Table 1). Highest number of genera was encountered in coastal water zone and reduction in genera was observed with reference to drop in salinity towards the riverine zone. With regard to chlorophyta and cyanophyta, the dominance was noticed in low saline riverine zone and was ill represented along high salinity gradient towards coastal water zone. The rhodophyta, though it was ill represented in low saline riverine zone but did not represent the community in high saline coastal water zone. Similarly, pyrophyta showed more preference to high saline coastal water zone and was not represented in the low saline riverine zone.



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The genera that were observed in both riverine and estuarine waters includes, Dinobryon, Gomphonema, Pinnularia, Surirella, Thalassiothrix, Tribonema (Chrysophyta), Anabaena, Aphanizomenon, Aphanocapsa, Aphanothece, Coelosphaerium, Gomphosphaeria, Lyngbya, Marssoniella, Microcystis, Nostoc, Oscillatoria, Phormidium, Spirulina, Stigonema (Cyanophyta), Actinastrum, Basicladia, Cladophora, Closterium, Desmidium, Dichotomosiphon, Hydrodictyon, Kirchneriella, Microthamnion, Mougoetia, Pandorina, Pleurotaenium, Prasinocladus, Scenedesmus, Sirogonium, Sphaerocystis, Spirogyra, Spirotaenia, Stigeoclonium, Triploceros, Ulothrix, Zygnema (Chlorophyta), Lemanea (Rhodophyta) (Table 3).

The genera that were observed in both estuarine and coastal waters includes, Bacillaria, Bacteriastrum, Bellerochea, Biddulphia, Chaetoceros, Climacodium, Cyclotella, Ditylum, Eucampia, Guinardia, Helicotheca, Lampriscus, Lauderia, Leptocylindrus, Proboscia, Pseudo-nitzschia, Rhizosolenia, Skeletonema, Triceratium(Chrysophyta), Trichodesmium (Cyanophyta), Akashiwo, Ceratium, Dinophysis, Lingulodinium, Noctiluca, Preperidinium, Protoperidinium (Pyrophyta) (Table 3).

The genera that were noticed exclusively in estuarine waters include Dictyocha, Cerataulina, Synedra (Chrysophyta), Gleocapsa (Cyanophyta) (Table 3).

The genera that were noticed exclusively in coastal waters include Hemiaulus, Pseudosolenia, Stephanopyxis (Chrysophyta) and Cladopyxis (Pyrophyta) (Table 3).

Mathivananet al. (2007) reported the dominance of cyanophyceae and chlorophyceae over diatoms in Cauvery river waters. Shashishekharet al. (2008) reported the dominance of chlorophyceae over diatoms and blue-green algae in river waters of Bhadra. Annalakshmi and Amsath (2012) investigating on the waters of river Cauvery and its tributary Arasalar, reported the dominance of chlorophyceae among phytoplankton community in river Cauvery, whereas cyanophyceae in river Arasalar.Panigrahy and Patra (2013) in river waters of Mahanadi,reported the dominance of chlorophyceae over that of bacillariophyceaeand cyanophyceae. The investigations by Goergeet al. (2012) revealed the dominance of bacillariophyceae over that of chlorophyceae, cyanophyceaeand dinophyceae in Tapi estuarine waters, while Parabet al. (2013) have reported the dominance of diatoms in Mandovi estuary. Investigating on the coastal waters of Kulai, Verlencaret al. (2006) observed the dominance of centrale diatoms such as Rhizosolenia, Leptocylindrus, Chaetoceros, Thalassiosiraand Coscinodiscus spp.

#### **CONCLUSION**

In the present study, with respect to number of genera representing each division of phytoplankton a discernable trend was observed along the salinity gradient. Under very low saline riverine conditions, chlorophyta was the dominant division followed by chrysophyta. While, moving towards the estuarine head region (S<sub>3</sub>), the number of genera representing the chrysophytaincreased andequalized the chlorophyta. Further towards coastal water stations, chrysophytaincreased at a rapid phase, thereby showed a preferential dominance in these stations over that of chlorophyta. The preferential dominance of cyanophyta was observed towards the riverine stations, which got significantly reduced towards coastal waters. Rhodophyta presence was observed up to estuarine head region (S<sub>3</sub>) while, pyrophyta made its presence only in coastal water influenced stations. Thereby, salinity showed an important influence on the dynamics of phytoplankton in the present investigation.



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Table 1.Spatial variation in number of genera representing different phytoplankton divisions

Stations	Riverine (Salinity 0.03 - 19.8	range:	nge: Zone(Salinity range:		Zone(Sali	nI water nity range: 5.30 psu)
Division of	<b>S</b> 1	S2	<b>S</b> <sub>3</sub>	<b>S</b> 4	<b>S</b> <sub>5</sub>	<b>S</b> 6
Phytoplankton						
Chrysophyta	18	19	23	35	34	34
Cyanophyta	15	16	18	5	2	2
Chlorophyta	28	28	23	4	1	1
Rhodophyta	1	1	1	nil	nil	nil
Pyrophyta	nil	nil	nil	7	8	8

Table2.Qualitative distribution of phytoplankton genera at different stations

Stations Genera	<b>S</b> 1	<b>S</b> <sub>2</sub>	<b>S</b> <sub>3</sub>	<b>S</b> 4	<b>S</b> 5	S <sub>6</sub>			
	CHRYSOPHYTA								
Asterionella spp.	+	-	+	+	+	+			
Bacillaria spp.	-	-	+	+	+	+			
Bacteriastrum spp.	-	-	-	+	+	+			
Bellerochea spp.	-	-	-	+	+	+			
Biddulphia spp.	-	-	-	+	+	+			
Campylodiscus spp.	+	+	+	+	+	+			
Cerataulina spp.	-	-	-	+	-	-			
Chaetoceros spp.	-	-	+	+	+	+			
Climacodium spp.	-	-	-	+	+	+			
Coscinodiscus spp.	+	+	+	+	+	+			
Cyclotella spp.	-	-	+	+	+	+			
Cymbella spp.	-	+	-	-	-	-			



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Dictyocha spp.	-	-	+	+	-	-
Dinobryon spp.	+	+	+	-	-	-
Diploneis spp.	-	+	-	-	-	-
Ditylum spp.	-	-	-	+	+	+
Eucampia spp.	-	-	-	+	+	+
Fragilaria spp.	+	+	+	+	+	+
Gomphonema spp.	+	+	+	-	-	-
Guinardia spp.	-	-	-	+	+	+
Gyrosigma spp.	+	+	+	+	+	+
Helicotheca spp.	-	-	-	+	+	+
Hemiaulus spp.	-	-	-	-	+	+
Lampriscus spp.	-	-	-	+	+	+
Lauderia spp.	-	-	-	+	+	+
Leptocylindrus spp.	-	-	-	+	+	+
Lithodesmium spp.	-	-	-	+	-	-
Melosira spp.	+	+	+	+	+	+
Navicula spp.	+	+	+	+	+	+
Nitzschia spp.	+	+	+	+	+	+
Pinnularia spp.	+	+	+	-	-	-
Planktoniella spp.	+	+	-	+	+	+
Pleurosigma spp.	+	+	+	+	+	+
Proboscia spp.	-	-	-	+	+	+
Pseudo-nitzschia spp.	-	-	-	+	+	+
Pseudosolenia spp.	-	-	-	-	+	+
Rhizosolenia spp.	-	-	-	+	+	+
Skeletonema spp.	-	-	-	+	+	+
Stephanopyxis spp.	-	-	-	-	+	+
Surirella spp.	+	+	+	-	-	-
Synedra spp.	-	-	+	-	-	-



Tabellaria spp.	+	+	+	-	+	+		
Thalassionema spp.	+	-	+	+	+	+		
Thalassiothrix spp.	+	+	+	+	-	-		
Tribonema spp.	+	+	+	+	-	-		
Triceratium spp.	-	-	+	+	+	+		
Uroglenopsis spp.	-	+	-	-	-	-		
	CYA	NOPHYTA	Ą					
Anabaena spp.	+	+	+	-	-	-		
Aphanizomenon spp.	+	+	+	-	-	-		
Aphanocapsa spp.	+	+	+	-	-	-		
Aphanothece spp.	+	+	+	-	-	-		
Coelosphaerium spp.	+	+	+	-	-	-		
Gleocapsa spp.	-	-	+	-	-	-		
Gomphosphaeriaspp	+	+	+	-	-	-		
Heterohormogonium spp.	-	-	+	-	-	-		
Lyngbya spp.	+	+	+	-	-	-		
Marssoniella spp.	+	+	+	-	-	-		
Merismopedia spp.	+	+	+	+	+	+		
Microcystis spp.	+	+	+	-	-	-		
Nostoc spp.	-	+	+	-	-	-		
Oscillatoria spp.	+	+	+	+	-	-		
Phormidium spp.	+	+	+	+	-	-		
Raphidiopsis spp.	+	+	-	-	-	-		
Spirulina spp.	+	+	+	+	-	-		
Stigonema spp.	+	+	+	1	-	1		
Trichodesmium spp.	-	-	+	+	+	+		
	CHLOROPHYTA							
Actinastrum spp.	-	+	+	-	-	-		
Basicladia spp.	+	+	+	-	-	-		
Bulbochaete spp.	+	+	-	-	-	-		



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Chlorella spp.	+	+	-	-	-	-	
Cladophora spp.	+	+	+	-	-	-	
Closterium spp.	+	+	+	-	-	-	
Cosmarium spp.	+	+	-	-	-	-	
Desmidium spp.	+	+	+	-	-	-	
Dichotomosiphon spp.	+	+	+	-	-	-	
Gonatozygon spp.	-	+	-	-	-	-	
Hydrodictyon spp.	+	+	+	-	-	-	
Kirchneriella spp.	+	-	+	-	-	-	
Micrasterias spp.	+	+	-	-	-	-	
Microthamnion spp.	+	+	+	-	-	-	
Mougeotia spp.	+	+	+	+	-	-	
Pandorina spp.	+	-	+	-	-	-	
Pediastrum spp.	+	+	+	+	+	+	
Pithophora spp.	+	+	-	-	-	-	
Pleurotaenium spp.	+	+	+	-	-	-	
Prasinocladus spp.	-	+	+	-	-	-	
Radiofilum spp.	+	+	-	-	-	-	
Scenedesmus spp.	+	+	+	-	-	-	
Sirogonium spp.	+	-	+	-	-	-	
Sphaerocystis spp.	+	+	+	-	-	-	
Spirogyra spp.	+	+	+	+	-	-	
Spirotaenia spp.	+	+	+	-	-	-	
Staurastrum spp.	+	+	-	-	-	-	
Stigeoclonium spp.	+	+	+	+	-	-	
Triploceros spp.	+	+	+	-	-	-	
Ulothrix spp.	+	+	+	-	-	-	
Zygnema spp.	+	+	+	-	-	-	
	RHODOPHYTA						
Lemanea spp.	+	+	+	-	-	-	



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PYROPHYTA										
Akashiwo spp.	-	-	-	+	+	+				
Ceratium spp.	-	-	-	+	+	+				
Cladopyxis spp.	-	-	-	-	+	+				
Dinophysis spp.	-	-	-	+	+	+				
Lingulodinium spp.	-	-	-	+	+	+				
Noctiluca spp.	-	-	-	+	+	+				
Preperidinium spp.	-	-	-	+	+	+				
Protoperidinium spp.	-	-	-	+	+	+				

Note: '+' indicates presence; '-' indicates absence

Table 3.Qualitative distribution of phytoplankton genera indifferentwater bodies based on salinity gradient

Type of water Genera	River waters (Salinity range: 0.03 - 19.85 psu)	Estuarine waters (Salinity range: 0.04 - 34.59 psu)	Coastal waters (Salinity range: 9.12 - 35.30 psu)
	CHRYSOPHYT	A	
Asterionella spp.	+	+	+
Bacillaria spp.	-	+	+
Bacteriastrum spp.	-	+	+
Bellerochea spp.	-	+	+
Biddulphia spp.	-	+	+
Campylodiscus spp.	+	+	+
Cerataulina spp.	-	+	1
Chaetoceros spp.	-	+	+
Climacodium spp.	-	+	+
Coscinodiscus spp.	+	+	+
Cyclotella spp.	-	+	+
Cymbella spp.	+	-	-
Dictyocha spp.	-	+	-
Dinobryon spp.	+	+	-



Diploneis spp.			
	+	-	-
Ditylum spp.	-	+	+
Eucampia spp.	-	+	+
Fragilaria spp.	+	+	+
Gomphonema spp.	+	-	-
Guinardia spp.	-	+	+
Gyrosigma spp.	+	+	+
Helicotheca spp.	-	+	+
Hemiaulus spp.	-	-	+
Lampriscus spp.	-	+	+
Lauderia spp.	-	+	+
Leptocylindrus spp.	-	+	+
Lithodesmium spp.	-	+	-
Melosira spp.	+	+	+
Navicula spp.	+	+	+
Nitzschia spp.	+	+	+
Pinnularia spp.	+	+	-
Planktoniella spp.	+	+	+
Pleurosigma spp.	+	+	+
Proboscia spp.	-	+	+
Pseudo-nitzschia spp.	-	+	+
Pseudosolenia spp.	-	-	+
Rhizosolenia spp.	-	+	+
Skeletonema spp.	-	+	+
Stephanopyxis spp.	-	-	+
Surirella spp.	+	+	-
Synedra spp.	-	+	-
Tabellaria spp.	+	+	+
Thalassionema spp.	+	+	+



Thalassiothrix spp.	+	+	-
Tribonema spp.	+	+	-
Triceratium spp.	-	+	+
Uroglenopsis spp.	+	-	-
	CYANOPHYT	A	
Anabaena spp.	+	+	-
Aphanizomenon spp.	+	+	-
Aphanocapsa spp.	+	+	-
Aphanothece spp.	+	+	-
Coelosphaerium spp.	+	+	-
Gleocapsa spp.	-	+	-
Gomphosphaeriaspp	+	+	-
Heterohormogonium spp.	-	+	-
Lyngbya spp.	+	+	-
Marssoniella spp.	+	+	-
Merismopedia spp.	+	+	+
Microcystis spp.	+	+	-
Nostoc spp.	+	+	-
Oscillatoria spp.	+	+	-
Phormidium spp.	+	+	-
Raphidiopsis spp.	+	-	-
Spirulina spp.	+	+	-
Stigonema spp.	+	+	-
Trichodesmium spp.	-	+	+
	CHLOROPHYT	A	
Actinastrum spp.	+	+	-
Basicladia spp.	+	+	-
Bulbochaete spp.	+	-	-
Chlorella spp.	+	-	-
Cladophora spp.	+	+	-



Closterium spp.	+	+	-
Cosmarium spp.	+	-	-
Desmidium spp.	+	+	-
Dichotomosiphon spp.	+	+	-
Gonatozygon spp.	+	-	-
Hydrodictyon spp.	+	+	-
Kirchneriella spp.	+	+	-
Micrasterias spp.	+	-	-
Microthamnion spp.	+	+	-
Mougeotia spp.	+	+	-
Pandorina spp.	+	+	-
Pediastrum spp.	+	+	+
Pithophora spp.	+	-	-
Pleurotaenium spp.	+	+	-
Prasinocladus spp.	+	+	-
Radiofilum spp.	+	-	-
Scenedesmus spp.	+	+	-
Sirogonium spp.	+	+	-
Sphaerocystis spp.	+	+	-
Spirogyra spp.	+	+	-
Spirotaenia spp.	+	+	-
Staurastrum spp.	+	-	-
Stigeoclonium spp.	+	+	-
Triploceros spp.	+	+	-
Ulothrix spp.	+	+	-
Zygnema spp.	+	+	-
	RHODOPHYT	Α	
Lemanea spp.	+	+	-
	PYROPHYTA	\ 	
Akashiwo spp.	-	+	+



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Ceratium spp.	-	+	+
Cladopyxis spp.	-	-	+
Dinophysis spp.	-	+	+
Lingulodinium spp.	-	+	+
Noctiluca spp.	-	+	+
Preperidinium spp.	-	+	+
Protoperidinium spp.	-	+	+

Note: '+' indicates presence; '-' indicates absence

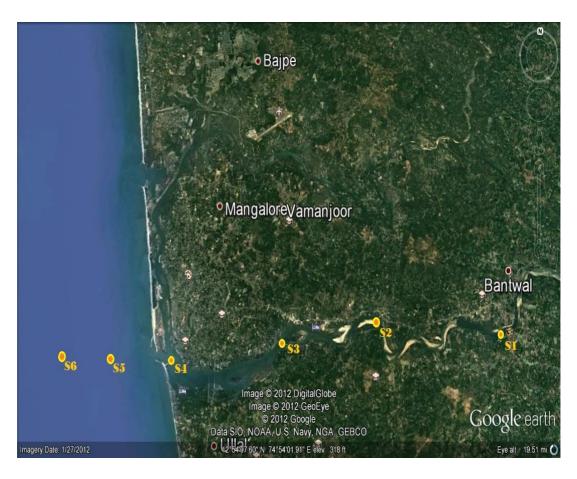
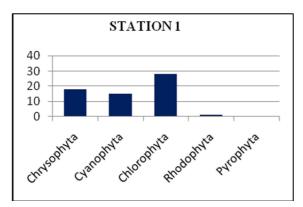
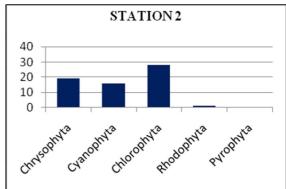


Fig.1: Map showing the location of sampling stations

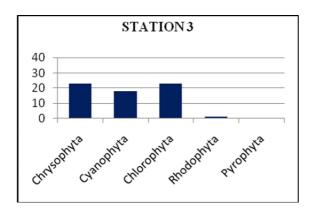


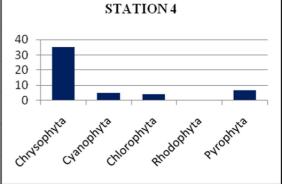


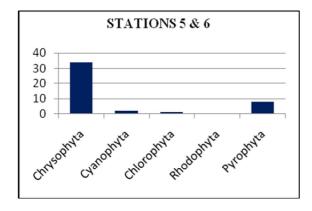


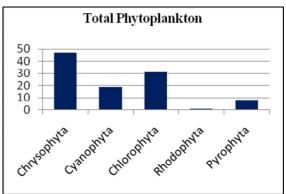








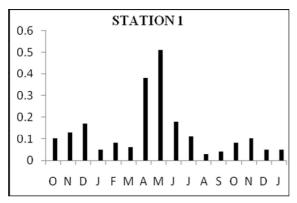


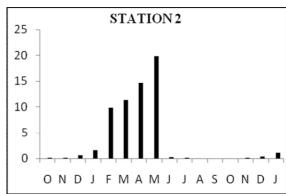


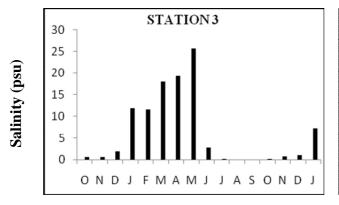
Divisions of phytoplankton Fig: 2Division wise distribution of phytoplankton generaat different stations

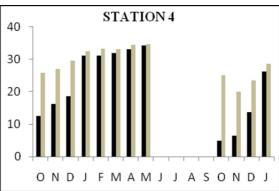


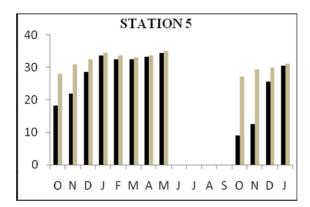
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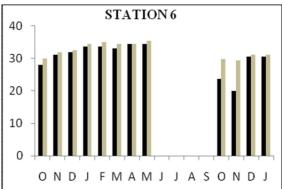












Surface

Subsurface

Months

Fig: 3 Monthly variations in salinity (psu) at different stations.



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#### **RESEARCH ARTICLE**

### Neural Network Prediction on Sardine Landings Using Satellite Derived Ocean Parameters Chlorophyll-A (Seawifs), SST and PAR

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#### **ABSTRACT**

Fourteen Artificiel Neural Network (ANN) models were developed to predict 12 month ahead monthly sardine landings was analyzed for Bay of Bengal, Tamil Nadu (Nagapattinam dt) coast, India, considering all sardine (14 species) catches with previous 144 months as inputs to the models. This Neural Network Models developed with Time Series of ocean colour parameters such as Chlorophyll-a (Chl-a), Sea Surface Temperature (SST) and Photosynthetically Active Radiation (PAR) as input in Time Series as dependent variable for the target of sardine catch time series in the study area as Seasonal (12 lag) and Non-Seasonal models for this study. The output from seasonal and Non-Seasonal models were compared and the seasonal model was out performed Non-Seasonal models in prediction. The NNM LTS\_MER\_SAR\_SST\_S model (R² between the predicted and observed landings is about 0.9032) performed well when compare to other Seasonal, Non-Seasonal Univariate and Multivariate Neural Network models. This study demonstrates that the ocean colour parameters Chlorophyll-a (Chl-a), Sea Surface Temperature (SST) and Photosynthetically Active Radiation can be used in the study area on sardine landing prediction. In general, seasonal ANN exhibits good performance in prediction of sardine catch landings when compare to Non-Seasonal ANN architecture.

**Key words:** Chlorophyll-a, Sea Surface Temperature, Photosynthetically Active Radiation. And Neural Network.



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#### INTRODUCTION

Pelagic fishes normally contributes 55% of total Indian marine fish production out of which the dominant fish commonly named as sardines (Sardinella longiceps +13 other Sardine species) contributes about 32% of the total pelagic marine fish production in India, is available in Tamil nadu coastal waters, which is one the most biologically productive region in the world (CMFRI annual report 2010-11). Normally fish landings are nonlinear in nature and this paper trying to forecast the monthly sardine catches of Nagapatnam district, may give effective management of sardine stock in the study area. This study also trying to fill the gap of underutilized Remote sensing parameter Photosynthetically Active Radiation (PAR) influence on sardine monthly prediction and their exploitation and assessment in Bay of Bengal through Artificial Neural Networks along with sardine landings. The traditional Auto – Regressive Integrated Moving Average (ARIMA p, d,q) models basically from Box- Jenkinson (1976) methodology, normally used for obtaining wide variety fisheries Time series predictions. Monthly landings are generally nonlinear ,which is not predicted effectively by ARIMA models, but it is efficient in modeling Linear phenomena in describing and predicting the fisheries time series of with a wide variety of species (Saila.S.B, et.al 1980), Hae-Hoon Park (1998), Stergiou KI (1996), Stergiou KI, Christou ED (1996)).

The study area Nagapatnam coastal district (Blue in color) in Tamil Nadu, eastern part in Bay of Bengal covering a coast line length of 190 km. Figure.01 explains the schematic representation of Nagapatnam district falls in the latitudinal and longitudinal extensions between 10°46′1.2″N and 79°49′58.8″E on the Eastern part of Bay of Bengal. The movement of fishermen and the seaside limit (1000 m isobaths) for the extraction of Sea Surface Temperature, Chlorophyll-a and Photosynthetically Active Radiation in bay of Bengal also shown in the figure 01. (Yellow in color). The minimum and maximum temperature are 20 °C and 34 °C. This district comprises of five coastal taluks that is Nagapattinam, Sirkazhi, Tarangampadi, Mayiladuturai and Vedaranniyam.

#### **Artificial Neural Networks**

There are so many different ways to forecast nonlinear phenomena, among them Neural Networks is the best efficient method to get forecast information from a nonlinear time series (Lin sun et.al 2009). There by the applications of neural networks to landings time series forecasting have become very popular over the last few years, since most of the landings time series are in nonlinear pattern. Neural networks are simple nonlinear computing units and just imitating human neural system has an input layer, a hidden layer and an output layer. Layers in between input and output layers are generally called as hidden layers and commonly referred as neurons. When data is loaded in the ANN (Artificial Neural Network), it must be preprocessed from its numeric range into the numeric range that the ANN can deal with efficiently to improve the efficiency of the learning results (Kim and Lee, 2004).

#### Fishery data

The Nagapatnam District, south east coast of India, taken as study area For this study and the sardine landing data from 1998 to 2009 were obtained from the CMFRI database. The data were collected by qualified and well-trained technical staff of CMFRI by following stratified multi-stage random sampling technique in which the oil sardine and other sardine landings were recorded by covering landing centre along the Nagapatnam coast. The catch data for the year 2010 were collected in entire Nagapatnam coastal area physically as in-situ data included in this time series for modeling testing purpose.

#### Satellite Data.

#### Chlorophyll-a concentration

The primary function of Chlorophyll is photosynthesis of marine algae present in the ocean. Algae is the main food for Sardine and Mackerel larvae and that availability of food during the critical developmental period of Sardine and



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Mackerel larvae determines the year class of Sardine & Mackerel population and hence CHL is one of the important indicator variable for Sardine and Mackerel availability in Bay of Bengal (BoB). So chlorophyll in Bay of Bengal is considered in NN prediction models for this study. SeaWiFS/MODIS/MERIS level 3 standard binned merged images archived by the Ocean Global colour website were used to estimate sea-surface case-1 CHL concentrations. These data were obtained freely in NetCDF format from the website <a href="http://ftp.acri.fr/GLOB\_4KM/RAN/CHL1/MERGED/GSM">http://ftp.acri.fr/GLOB\_4KM/RAN/CHL1/MERGED/GSM</a>. The images are Global Area Coverage (GAC) monthly composite SeaWiFS/ MODIS/ MERIS data with a spatial resolution of about 4.5 km for the period are considered from January 1998 to December 2010.

#### Sea Surface Temperature (SST)

In sardine life cycle Sea Surface Temperature is an important factor which leads the sardine activity levels to increase or decrease, makes sardines move into certain areas, and influences feeding and reproductive activity. Temperature data are of interest to those who wish to catch fish or study them. Since the oil sardine is a tropical fish we need to understand how temperature affects fish behavior. So Sea Surface Temperature also considered as one of the main environmental factor in the sardine landing prediction which is normally preferring temperature range of 27° to 29°C (Chidambaram, 1950). The NOAA pathfinder data presented in ftp://podaac.jpl.nasa.gov/allData/avhrr/L3/pathfinder\_v5/monthly/ data were used to study SST for the same period having the same spatial resolution along with chlorophyll data.

#### Photosynthetically Active Radiation (PAR).

Photosynthetically Active Radiation (PAR) is the amount of light available for photosynthesis, which is defined as the quantum energy flux from the Sun light in the 400 to 700 nanometer wavelength range. Since the sardines are herbivores Photosynthetically Active Radiation Also considered as one of the biophysical parameter. PAR changes seasonally and varies depending on the latitude and time of day. This data set consists of algorithm estimates of global Photosynthetically Active Radiation (PAR) reaching the surface obtained by the Sea-viewing Wide Field-of-view Sensor (SeaWiFS), in orbit on the OrbView-2 (formerly SeaStar) platform. SeaWiFS data products are processed and distributed by the Ocean Biology Processing Group (OBPG). For this study SeaWiFS Level 3 monthly Binned data files are downloaded from the FTP site at http://oceancolor.gsfc.nasa.gov/cgi/l3 having 9 km spatial resolution.

#### Image processing

Monthly mean CHL, SST and PAR images for the entire period were downloaded, processed and extracted in BEAM software developed by European Space Agency(ESA). BEAM is an open-source toolbox and development platform for viewing, analyzing and processing of remote sensing raster data. BEAM supports a number of raster data formats such as GeoTIFF, HDF and NetCDF as well as data formats of other EO sensors such as Moderate Resolution Imaging Spectroradiometer (MODIS) and Advanced Very High Resolution Radiometer(AVHRR). The remote sensing data extracted for this study was in both NetCDF and HDF format, which is supported by BEAM software. A total of 540 images were downloaded, processed and spatially averaged as point data for each polygon for this TS preparation. A 1000 meter isobaths (Yellow colour in Figure No.1) of Tamil Nadu region in Bay of Bengal was digitized in ARC GIS environment. This isobath shape file again bifurcated into district polygons of all Tamil Nadu coast to extract monthly mean information for CHL, SST and PAR. These polygons are imported into BEAM software along with monthly mean images of CHL, SST and PAR parameter to get the month wise time series of all 12 polygons (coastal districts) for six years from 1998 to 2010.



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#### **METHODOLOGY**

The time series of Nagapatnam district sardines monthly landings were normalized from zero to one by simply dividing the real value by the maximum of the appropriate set because of their nonlinearity. The time series belongs to CHL, SST and PAR is kept as such, since they are having only seasonal influences on it. The in-situ sardine landing time series collected for the year 2010 January to December in all the landing centers of Nagapatnam district. The spatially averaged CHL, SST and PAR value extracted from images of Thiruvallur District to Ramanathapuram District. The sardine landings time series modeled in Matlab (R2012a) Neural Networks to get the prediction values for the year 2010 and compared with the insitu catch data. In this NN function the CHL, SST and PAR parameter up to 1998 - 2009 as input against the year 2010 as target to model to predict the sardine monthly catch for the year 2010 to Nagapatnam area.

#### Methods of evaluation.

Several measures of accuracy were calculated in the calibration between model output and observed value. A measure of correlation between the observations and the predictions is the coefficient of correlation (R). The proportion of the total variance in the observed data that can be explained by the model was described by the coefficient of determination (R2). The estimators to quantify the errors in the same units of the variance were the square root of the mean square error (RMSE), and the mean absolute error (MAE). On the other hand other measures of variance were the Coefficient of Efficiency (E2) (Nash and Sutcliffe, 1970; Kitanidis and Bras, 1980), the Average Relative Variance (ARV) (Grin o. R. 1992), and the percent standard error of prediction (SEP) (Ventura et al., 1995) also analyzed for sensitivity analysis in this study. The E2 and AVR were used to see how the models explain the total variance of the data and represent the proportion of variation of the observed data considered for sardine forecasting modeling. The SEP allows the comparison of the forecast from different models and different problems because of its dimensionless. For a perfect performance, the values of R² and E² should be close to one and these of SEP and ARV close to zero. The optimal model is selected when RMSE and MAE are minimized. The above estimators are given by:

$$R = \frac{n \sum Y_1 \tilde{Y}_1 - (\sum Y_1)(\sum \tilde{Y}_1)}{\sqrt{n(\sum Y_1^2) - (\sum Y_1)^2} \sqrt{n(\sum \tilde{Y}_1^2) - (\sum \tilde{Y}_1)^2}}$$
(1)

$$E = 1.0 - \frac{\sum_{i}^{n} |Y_{i-} \widehat{Y}_{i}|^{2}}{\sum_{i}^{n} |Y_{i-} \overline{Y}_{i}|^{2}}$$
(2)

$$ARV = 1.0 - E^2 \tag{3}$$

RMSE = 
$$\sqrt{\frac{\sum_{i=1}^{r_2} |Y_{i-} \hat{Y}_{i}|^2}{n}}$$
 (4)

$$MAE = \frac{\sum_{i=1}^{n} \left| Y_{i-} \widehat{Y}_{i} \right|}{n}$$
 (5)



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$$MAPE = \frac{100}{n} \times \sum_{i=1}^{n} \left| \frac{Y_{i-} \widehat{Y}_{i}}{Y_{i}} \right|$$
(6)

$$SEP = \frac{100}{\overline{Y}_1} RMSE \tag{7}$$

Where  $Y_i$  is the observed value,  $\widehat{Y}_i$  is the forecasted value to  $Y_i$ , and n is the number of the observations of the validation set.  $\overline{Y}_i$  is average mean value of the target.

#### **RESULTS AND DISCUSSION**

In this paper, time series data, (1998 to 2010) of SST, CHL and PAR for thirteen years is considered as environmental input variables for NNM to predict the Sardine landing in the study area.

From Figure 2. it is important to notice that the monthly mean temperature in Bay of Bengal for the peak Sardine landing period (March-August) was in between from 26.0 to 29.57°C. The chlorophyll concentration during the peak landing period is between 0.8 to 1.5 mg/m<sup>3</sup>. The PAR value was also high in the months of March to August, where the landing was high for Sardine. The temperature and CHL relation in the peak summer (April and June) indicates that the temperature increment gives the CHL decrement and it is inferred that both are inversely related to each other in Bay of Bengal to some extent. Figure. 3. shows that landings of Sardine is high during the period March-August .The Government of Tamil Nadu has declared that the month of May (i.e. actually from April 15th to May 30th) is a closed season for fishing. However, since non-mechanised vessels and mechanised vessel (<10hp) are allowed during the period for fishing. Chidambaram (1950) observed that a temperature of 26°C to 28°C is favourable for the inshore migration of the Sardine and with the rise of temperature above 29°C during March-May period, they disappear to deeper waters. He also related the specific gravity of water, which goes above 1.023 during March-May months also the reason for the disappearance of the shoals. Nair (1959) felt that both the shoreward migration of spawners during the monsoon as well as their outward migration to deeper waters during the post-monsoon months are for spawning purpose. Antony Raja (1967), found three phases of feeding habits for Sardines, the first from May to August, characterised by diatoms, the second from September to November, dominated by dinoflagellates and the December to April which was essentially a miscellaneous one made up of diatoms, infusorians, copepods, larval bivalves and heliozoans. For Mackerel, observations made at Mandapam on the south east coast of India indicated the possibility of two spawning periods, one during October-November and the other major spawning during May-June (CMFRI Annual Rept., 1957). The inference drawn by Bhimachar and George (1952) that food could be a major factor governing these migrations is contended by Sekharan (1965). He also felt that without studying the plankton available in the offshore waters the shoreward migration should not be linked with the food factor.

#### LTS (Merged) Sardine Neural Network Analysis

Table 1. summarize the LTS (Merged) NNM sensitivity analysis on Sardine landings for Nagapattinam coast of Tamil Nadu for both Seasonal and Non-Seasonal models. The TS on Sardine landings shows the period of March, April, June and July with highest landings and the months from August to February showing lowest landings. For the year 2010, the lowest landing recorded in the month of May, because of closed season from April 15 to May 30 implemented by Tamil Nadu state. This 2010 landing details of Sardine and Mackerel seem to confirm the migratory



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nature of oil Sardine and Mackerel in the study area, as it has already discussed in the chapter 5.1. Coming to the results of NNM fit between the environmental variables—and to the observed Sardine landings, Seasonal models gives better prediction than the non seasonal NNM. In seasonal all the Multivariate NNM combinations are performed well, when compared to Non-Seasonal NN analysis. The Non-Seasonal and Seasonal—individual SST NN models are performed well, when targeting with the Sardine landings with a high Coefficient of Determination (R<sup>2</sup>) values of 0.57 and 0.82 respectively. The other two environmental factors CHL and PAR, despite being statistically significant in Seasonal—NN analysis, showed negative Correlation—on prediction in Non-Seasonal models. This negative Correlation, influences when it is combinely performing with other environmental variables particularly SST. The detailed analysis on NNM for Non-Seasonal and Seasonal are explained in the coming sections.

#### LTS (Merged) Sardine Non Seasonal Models

From the sardine monthly time series, it is clear that the target observed value for the year 2010 the month June is having the highest landing value for Sardine and the May month is showing very low landing. The Figure 4. explains the NNM performance graphically model wise and month wise. In LTS NN Sardine Non-Seasonal models the month of June is having high prediction variation except in LTS\_MER\_SAR\_SST\_NS model. Similarly, the March month, the second high landing profile month also resulted with more variation in all the Sardine Non-Seasonal models. Among them the model LTS\_MER\_SAR\_SC\_NS predicted well with small variation, when compared to all other non-seasonal models. Additionally the LTS\_MER\_SAR\_SC\_NS model is giving overestimation in November and April months. Further, the model LTS\_MER\_SAR\_SST\_NS showing more variation in the months of February and March interms of under estimation, but this model's performance was first among the Non-Seasonal models and ranked EIGHTH in the entire fourteen models. The predictive capability of LTS\_MER\_SAR\_SST\_NS is explained here with its sensitivity results i.e. R2= 0.57, % SEP= 82.22, E= 0.4410, and MAPE =342.94, %. Again this model LTS\_MER\_SAR\_SST\_NS shows more variation as overestimation in the month of December, But, even after its variations the model's performance was impressive when compared with the remaining two other environmental variable's individual performance with the observed Sardine landings. The Non-Seasonal CHL's individual and its combination performance with other two variables are giving negative correlation with the observed landing except in LTS\_MER\_SAR\_SC\_NS and LTS\_MER\_SAR\_CSP\_NS models. This infers that when CHL combinely performed with SST and PAR in NS models and takes the model's performance into, further more variation and less accuracy, when compared to its individual NN Non-Seasonal model performance. Next to the month of May low catch landings are observed in the months of October, November, December and January but less variations are observed in these months in all Non-Seasonal models except LTS\_MER\_SAR\_CHL\_NS. So performance of Non-Seasonal Neural Network analysis in this study are having good correlation with low catch winter season months.

#### LTS (Merged) Sardine Seasonal Models

Figure 5. shows the LTS merged NN seasonal Sardine model's sensitivity analysis for all combinations. In general all the models performed well, when compare to NN Non-Seasonal model analysis. In Non-Seasonal models winter months low landing predictions gives the better performance. In the same way, seasonal NN models also have predicted well in their seasonal orientation with winter months low landing observed values. In seasonal NNM, four major variations have been observed in the months of February, June, September and November. Almost all models are underestimating the June month prediction. The model LTS\_MER\_SAR\_SP\_S, overestimate in the month of February and the model LTS\_MER\_SAR\_SC\_S overestimate in the month of September and November. In seasonal, lowest observed landing month's (May) value was closely predicted by all the seasonal models with its observed value and the highest landing month's (June) prediction also matched well with 70% of its observed landing values. These results showed that high prediction capacity of seasonal NNM with satellite environmental variables, even though the fish catch landings are having strong nonlinear relationship.



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As a whole fewer variations are observed in the months of October, December and January, which indicates that Seasonal models prediction, was always better than that of Non-Seasonal models. Hence, seasonal models are best fit for low landing winter season and high landing monsoon period Sardine landings in the study area. Among the models, seasonal LTS\_MER\_SAR\_SST\_S model is ranked first, (arrived from their Coefficient of Determination) among models and the sensitivity results shows that, R²=0.8158, % SEP=53.67, E=0.7618 and MAPE = 24.73, SST is the most significant environment variable included in this model for Sardines. Model LTS\_MER\_SAR\_CSP\_S is ranked second and having the sensitivity results of R²=0.8120, % SEP=49.41.67, E=0.7981 and MAPE = 71.08 %. Normally R² and E should be nearer to one and the % SEP & MAPE should be as low as possible and nearer to zero. The SST and CSP—seasonal models are having very small difference in R². The CSP model is having less % SEP value when compared to SST, but the MAPE was 71 % in CSP, where as the SST is having only 24.73 % of MAPE. Hence, the variance is very less from the mean observed value in SST. Therefore, among two the SST model is considered as the best

#### CONCLUSION

Previous reports shown that Neural Networks prediction have been performed well for nonlinear Univariate fisheries data when compare to traditional ARIMA in both seasonal and Non-Seasonal data. H. Raman et.al. (1995). In this study the seasonal Neural Network models as a whole is giving good correlation and stood first eight positions out of sixteen models. However The seasonal model performed well when compare to multivariate Non-Seasonal models. The results from LTS\_MER\_SAR\_SST\_S on the sardine fish landings have shown 90% correlation and a minimum MAE of 0.0010 between observed and estimated sardine landings in Nagapatnam district. The model LTS\_MER\_SAR\_CSP\_S is having good correlation next to LTS\_MER\_SAR\_SST\_S, but having more MAPE variation in it. Same time Chlorophyll-a and its combination's performances are coming after all Sea Surface Temperature models performance. This gives the sardines in the study area are closed associated with temperature not with Chlorophyll-a in Bay of Bengal . However more research required to get deep understanding of the extent and nature of the relationships between environmental variables and sardine landings in the study area. With respect to the performance on amount (high and low) of landing and its prediction, seasonal Multivariate models giving high correlation and less variance. Winter months are modelled better in both Non-Seasonal and Seasonal models. The Non-Seasonal model trying to performs well only when the landings are high and perform well in the low landing winter seasons. To understand the complexities and seasonal nonlinearities, further studies are requires on the nature of uncertainity associated with the food and feeding habits of sardine, and the physiological changes which influence the ocean environment.

#### **ACKNOWLEDGEMENTS**

The authors are highly thankful to NERSC, Bergen, Norway and Cochin, India for providing opportunity to work in their laboratory to design the model and also to provide the time series landings data from CMFRI through NERSI India. Special thanks to the Mr. A. Elango, Deputy Director Of Fisheries, Tamil Nadu Fisheries Department, Chennai, and his team, for their help in collection of in-situ sardine landing data in Nagapatnam district.

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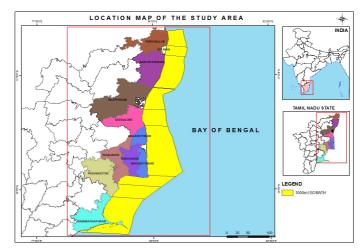
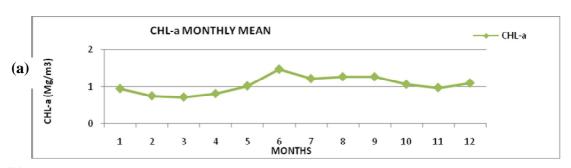
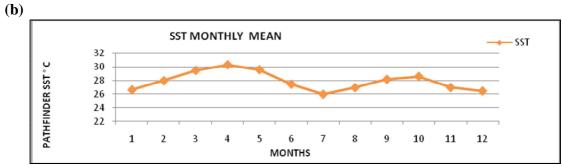


Figure 1. Study Area Details Of Nagapatnam District in Bay of Bengal







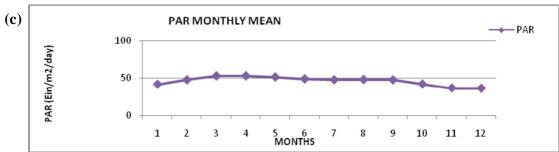


Figure 2.Monthly Mean value (1998-2010) of CHL (a), SST (b) and PAR (c)

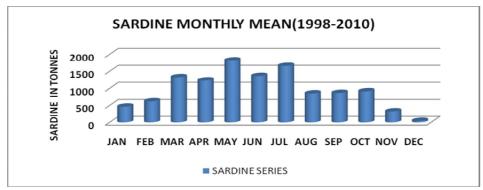
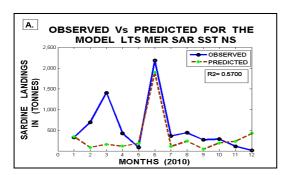


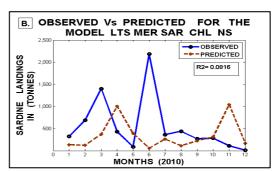
Figure 3.Monthly average variability (1998-2010) of Sardine landings.

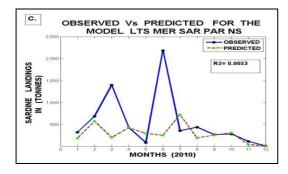


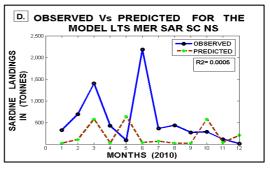
Table 1. Summary of LTS (Merged) Sardine Neural Network analysis

		LTS	(Merged	) SARDI	NE NEU	RAL NET	WORK A	ANALYS	IS				
S.No	DESCRIPTION	R	R2	MSE	RMSE	MAE	МАРЕ	E	ARV	SEP	MODEL	EPOC H	Rank
1.	LTS_MER_SAR_SST_NS	0.7550	0.5700	0.0024	0.0486	0.0347	342.94	0.4410	0.559	82.22	1:20:15:1	5000	8
2.	LTS_MER_SAR_SST_S	0.9032	0.8158	0.0010	0.0317	0.0139	24.73	0.7618	0.238	53.67	01:03:01	500	1
3.	LTS_MER_SAR_CHL_NS	-0.2857	0.0816	0.0071	0.0844	0.0571	251.47	-0.6843	1.684	142.73	1:20:15:1	5000	9
4.	LTS_MER_SAR_CHL_S	0.8820	0.7780	0.0012	0.0341	0.0154	25.47	0.7252	0.275	57.65	01:03:01	500	5
5.	LTS_MER_SAR_PAR_NS	0.0728	0.0053	0.0053	0.0725	0.0387	58.80	-0.2421	1.242	122.57	1:20:15;1	5000	13
6.	LTS_MER_SAR_PAR_S	0.8841	0.7817	0.0011	0.0325	0.0169	35.10	0.7498	0.250	55.01	01:03:01	500	4
7.	LTS_MER_SAR_SC_NS	-0.0230	0.0005	0.0064	0.0802	0.0568	257.73	-0.5192	1.519	135.55	2:15:15:1	5000	14
8.	LTS_MER_SAR_SC_S	0.8922	0.7960	0.0009	0.0303	0.0212	83.38	0.7819	0.218	51.363	02:03:01	300	3
9.	LTS_MER_SAR_SP_NS	0.1253	0.0157	0.0055	0.0745	0.0503	255.84	-0.3112	1.311	125.93	2:15:15:1	5000	12
10.	LTS_MER_SAR_SP_S	0.8063	0.6502	0.0015	0.0391	0.0213	44.19	0.6393	0.361	66.05	02:03:01	300	7
11.	LTS_MER_SAR_CP_NS	-0.1946	0.0379	0.0059	0.0770	0.0448	200.51	-0.4011	1.401	130.18	2:15:15:1	5000	11
12.	LTS_MER_SAR_CP_S	0.8531	0.7277	0.0014	0.0373	0.0167	33.53	0.6705	0.329	63.13	02:03:01	300	6
13.	LTS_MER_SAR_CSP_NS	0.2589	0.0670	0.0058	0.0761	0.0495	83.74	-0.3704	1.370	128.74	03:15:01	5000	10
14.	LTS_MER_SAR_CSP_S	0.9011	0.8120	0.0009	0.0292	0.0186	71.08	0.7981	0.202	49.41	03:03:01	225	2
SAR-Sa	rdine, S-Seasonal, NS-Non-Se	asonal, M	ER-Merg	ed, SC	-SST	& CHL,	SP-SST &	PAR, C	P- CHL	. & PAR,	CSP -	CHL, SST	& PAR

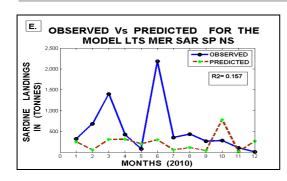


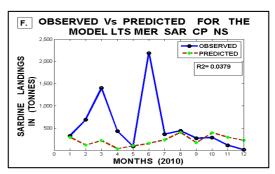


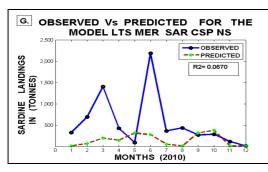












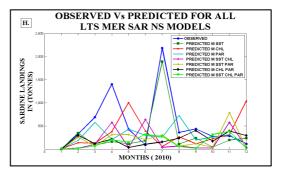
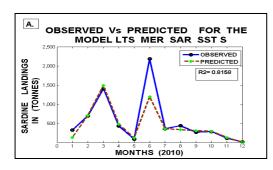
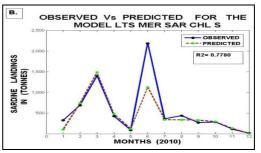
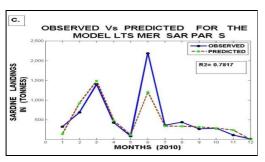
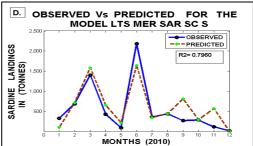


Figure 4. LTS (Merged) Sardine Non Seasonal combinations fit for all model combinations

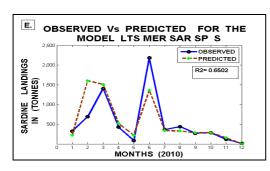


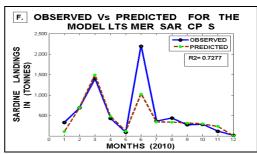


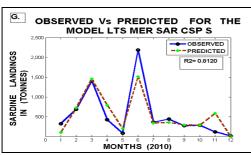












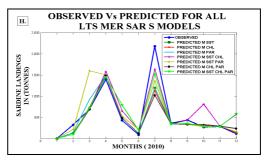


Figure 5. LTS (Merged) Sardine Seasonal fit for all model combinations



#### RESEARCH ARTICLE

## Investigate the Effect of Attribution Retraining and Rhythmic Movements Training on the Recovery of the Accuracy of the Students in Rural Regions

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#### **ABSTRACT**

The purpose of the present study is to investigate the effect of attribution retraining and rytmic movements Training on the Recovery of the Accuracy of the students in rural regions in Iran. The study had a pretest-posttest quasi-experimental design with 45 subjects randomly assigned to one control and two experimental groups. The Wechsler Intelligence Scale for Children-Revised (WISC-R) and Colorado Learning Difficulties Questionnaire (CLDQ) were given before the start of the study. Moreover, in the pretesting phase, a researcher-made spelling test was administered to the subjects of the study. The subjects in the first experimental group were given attribution retraining for 8 sessions along while the second experimental group was was given rytmic movements Training For 8 sessions. The cross-comparison of the 3 groups showed that there was a statistically significant difference among them in the reduction of the Accuracy errors which had the highest frequency among the errors observed. Moreover, the results obtained showed that there was no significant difference between the two treatment methods used in the two experimental groups, attribution retraining and rytmic movements Training.

**Key words:** attribution retraining, rhythmic movements training, Accuracy.



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#### INTRODUCTION

Learning problems are inevitable realities in every society and culture. Children facing these learning problems usually suffer learning disabilities. However, their growth pattern, weight, and tallness are indications of their normal cognitive and physical development. Neither they suffer any intellectual retardation. Like other children of their age, they speak and play games normally. However, in terms of their school achievement, they are faced with serious problems in one or more subjects so that they can not continue their schooling without receiving special remedial instruction provided for children with these problems (Faryar & Rakhshan, 2008). Special disabilities are due to problems in using one or more psychological processes in understanding and using language in oral or written form which are usually observed in the form of problems in listening, thinking, speaking, reading, spelling, or counting. These disabilities include conditions such as brain injuries, brain malfunctioning, misreading, and an aphasic growth. Children with learning problems because of vision defects, hearing problems, psychomotor problems, retardation, emotional problems, environmental, economic, and cultural deprivations are all excluded from this category of disabilities (Omidvar, 2005). It must be remembered that learning disability is not synonymous with Remedial reading, nor with Slow learning. More specifically, it refers to children and young adults faced with serious learning disabilities (Vallas& Jims, 1994). Emz believes that children with mild learning disabilities can follow normal school curriculum and program with some modifications while students with special (severe) learning disabilities need special therapeutic instructional intervention. The studies done so far show that the definitions provided for learning disabilities are different (Omidvar, 2005). This is partly because learning disabilities refer to disorders raging in severity which can affect people of different age groups ranging from children to adults. Consequently, every theory looks at one specific dimension of learning disabilities while ignoring other factors. It must not be forgotten, however, that learning disability is a complex multi-faceted phenomenon the treatment of which needs due attention to all factors introduced by different theories. For example, it has been shown that children with spelling problems besides overcoming no happened. However, in the treatment of these problems, one cannot ignore the importance of the limited attention span, low self-esteem, and the bad feeling of these children, rather he/she must have a broader look at the issue considering all the relevant factors.

#### Background research

Writing disorder (dysgraphia) refers to spelling problems and a combination of difficulties in abilities with written expression as evidenced by grammatical and punctuation errors within sentences, poor paragraph organization, multiple spelling errors, and excessively poor had writing (Naderi, 1374). Many researchers believe that the major symptoms of writing disorder are poor handwriting, spelling problems, and dysgraphia (Hooper, 2002). A number of factors have been identified as causing dysgraphia including: lack of care and attention, poor psychomotor skills, problems with visual perception of words and letters, limited visual/auditory memories, inability to transfer information from one sensory channel to another, and the abstractness of the topic of texts (Ahmadaie, 2003). Children who suffer writing disorder in the early years of their schooling face problems in spelling and expressing themselves using grammatical structures normal for their age. Their oral and written sentences alike contain multiple grammatical errors. They also face problems in writing paragraphs. Students with this disorder usually have difficulty writing simple short sentences during the second grade of the primary school and above. For example, although they are frequently told to start a sentence with a capital letters, or use punctuation marks at the end of sentences they write, they forget to do so. The most frequently observed problems among children with writing disorder are: spelling problems, grammatical errors, punctuation mistakes, poor handwriting, and problems in paragraph writing. As these students get older and go to upper grades, their sentences get noticeably more premature, strange and lower in terms of structure than what is expected of their age; the words they use are semantically inappropriate; their paragraphs lack suitable coherence and organization; and as the words they encounter in lessons get more abstract, these students suffer more spelling problems. Students with these disabilities usually show the following characteristics: lack of interest to attend school and do their school works (homework),



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weak performance in school subjects such as mathematic, a general lack of interest in school, running away from home, and a drastic change in behavior. The following characteristics help in the diagnosis of writing disability: illegible handwriting, abnormal size of letters in their writings, omission of letters and words, slow rate of writing, strange form of the hand and wrist while holding a pen, avoidance from writing, fast muscle contraction (fatigue, pain, strain) while writing, talking to oneself while writing, inability to express ideas in writing, providing too short answers, lack of interest in writing, unwillingness to show one's writings to others, careless fast writing (Graham, Harris & Larsen, 2001). Tabrizi (2013) attributed the spelling errors of students to the following sources: visual memory, auditory memory, sequential visual memory, auditory sensitivity, instruction, illegible writing (spelling), accuracy, reverse coding and Mirror writing. From among these errors, accuracy-based errors are the most frequently occurring type of errors among students. These errors occur when students omit some minor spelling mechanics because they do not have the necessary care. The provision of the necessary instructional intervention to improve the spelling skills of students requires a thorough analysis and identification of the major causes for their spelling errors. A variety of factors related to writing disabilities have been studied by different scholars. The followings are among the major factors relevant to writing disabilities: attitudes of parents towards children with specific learning disabilities (Chanderamuky, 2012), cognitive executive functions (Alizade, 2006; Aghababayi, 2012), sensor-motor functions of the hand (Havaie, 2010), phonological processing problems (defects) (Baezzat, 2009), visual memory defects (Tabrizi, 2013), motor skills (Lerner, 2011), genetic factors (Raskind, 2000; Yates, 2004; Jonson, 2005; Grigorinko, 2011), brain and neurological activities (Richards, 2006; Jack, 2007). The findings of the studies done so far show that students with learning disabilities show the following common characteristics: low tolerance in the face of failure, low self-esteem, low morale, weak social skills, low school achievement, school dropout, low job promotion, and abnormal brain activities ( Efstratopoulou, 2012). It can be concluded learning disabilities can be observed in people with different levels of intelligence due to different emotional, cognitive, and psycho-motor factors. Because of the importance of the emotional and cognitive dimensions in the personality of students, an attempt is made in this study to improve the accuracy of the students with spelling problems using emotional-, cognitive-methods.

Rhythmic movement therapists believe that this form of training can help people improve their control over their emotion, and cognition. When one is stressed, his or her body releases Cortisol which can have a negative effect on memory through miniaturizing the memory center (through making the memory center smaller). Those participating in rhythmic movement training sessions can control their stress through doing relaxation and stretching activities (exercises), thus preventing the releasing of Cortisol in their body. It is believed that physical movements in general can help improve the retention, remembering, retrieving of concepts (Jessica, 2005).

Therefore, the functioning of the brain and the nervous system can be improved through suitable physical activities, in general, and rhythmic movements, in particular. In this way, the learning ability can be enhanced. One approach to improve intellectual, social, emotional, and physical growth is through (Ghanaie Chaman Abad, 2006). Therefore, creative rhythmic movements can provide deep visual, linguistic, and thus can optimize learning potential. In addition to cognitive and psychomotor factors, motivational and emotional factors play an important role in learning. This theory provides a better and deeper understanding of the behavior of students with spelling disorders. A major source of problem for students with learning disabilities can be their low motivation, and their emotional status when faced with various difficulties. Many specialists have claimed that many students with learning disabilities lack the necessary motivation to learn and are more externally motivated than internally. It is not surprising that many specialists believe that because the source of motivation is outside the learners and because they usually provide discouraging feedback, students with learning disabilities are faced with the danger of learnt inability because these students believe that their attempts do not result in their receiving favorable feedback (Hallahan, 1999). Attributing favorable good results to stable factors increases success expectation in future and thus more attempt in the face of troubles while attributing favorable results to unstable factors decreases success expectation. Moreover, it may lead to the abandoning of attempt altogether. Attribution theory is a cognitive-motivational model considering



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individuals as logical, aware decision makers (Pentrich, 2011). These causal (functional) factors have the cognitive force to affect success expectation, self-efficacy, emotions, and behavior of individuals (Pentrich, 2011).

Studies done on learnt inability show that compared to normal students, those with learning disabilities are more likely to attribute their failure to general internal stable factors, and their success to specific external unstable factors (Klein, 1976; Miler, 1986). Some therapeutic helps have been proposed to change the wrong attribution pattern of students with learning disabilities. The central core of these therapies rests on helping students to attribute their failure and success to their attempts. In these therapies, there is usually an experimenter who interacts with a student and works on his homework, and after success or failure accompanied with the student's attempt provides attempt attribution for the student. Attribution retraining is an intervention strategy to obviate students' motivational problems in learning, analyzing the attributions responsible for students' failure and success at school (Vainer, 2000).

The results of this study can help teachers, tutors, and those working in Center for Remedial Instruction of the Students with Special Learning Disabilities, counselors, and parents to help children and students with special learning disabilities. The purpose of the present study was to compare the effect of two therapy methods (attribution retraining and Rhythmic Movement Training) on improving students' accuracy in spelling. Therefore, the following hypotheses were made.

- -Attribution retraining has no significant effect on improving students' accuracy.
- -Rhythmic movements training have no significant effect on the recovery of accuracy.
- There is a statistically significant difference between these two methods in terms of their effects on students' spelling ability.

#### **METHODS**

The present study was an applied pretest-posttest quasi-experimental one with a control group. The treatment provided to two experimental groups is considered the independent variable which has two forms: attribution retraining and rhythmic movement training. The dependent variable is the improvement of the Accuracy of the students in 3 groups (two experimental and one control group) measured through the spelling tests administered before and after the treatments given to the two experimental groups. The statistical population of the present study included all male fifth graders with spelling disorders registered in The Center for Remedial Instruction of the Students with Special Learning Disabilities in 2013-14.

Some 45 fifth graders were included in the sample of the study. The subjects of the study were selected on a purposive random sampling procedure from among students with learning problems registered in Jovein Educational center for students with special learning problems. More specifically, in a meeting with parents of the students, the purpose of the study along with its procedures was explained, then, 45 students, all of whom went to school in poor, deprived and less developed regions, were selected from among those willing to participate in the study. All the teachers participating in the study were similar in terms of work experience and teaching methodology. The following instruments were used in the present study:

The Wechsler intelligence scale-fourth edition (WISC-IV): The Wechsler intelligence scale-fourth edition is an update of Wechsler intelligence scale for children. Wechsler test was translated, adjusted with children and normalized by Abedi, Sadeghi and Rabiee with the financial support of the department of education of Chahar Mahale Bakhtiari. The final reliability coefficients reported for the subtests of this test through Cornbrash's Alpha and split-half method



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were 65%- 92% and 76%- 91%, respectively. The high correlation observed between the subtest scores and the total test scores shows the suitable validity of this test. The reported validity indexes for this test ranged between .66 to .92 (Sharifi, Rabiei,2013).

Colorado learning difficulties questionnaire (CLDQ): This questionnaire was designed to identify children with learning disabilities by Wilkie et al. this questionnaire, with desirable psychometric properties, relates learning problems to five major causes: reading, arithmetic calculation social awareness (understanding), social anxiety and educational facilities. The present questionnaire which has twenty items was administered to the parents.

A Researcher-made spelling test: this spelling test was made by a group of five teachers of the fifth grade of primary school. The test contained sentences with common spelling problems made by fifth graders. The reliability of the test was estimated by test-retest method. Moreover, the validity of the test was confirmed by seven experienced and knowledgeable primary school teachers.

The subjects of the study were randomly assigned to the control and experimental groups. The subjects of each experimental group received 8 2-hor-long sessions in a period of 2 months. More specifically, the subjects in the first experimental group received 8 sessions of attribution retraining while those in the second group received rhythmic movement training for 8 sessions.

#### The present Study's finding

SPSS was used for the descriptive and inferential statistical analysis of the data. First, the gathered data were described using frequency, percentage, mean, and standard deviation. Then, some statistical tests including one-way anova, monova, chi-square, and Tukey test were run on the described data.

First hypothesis: attribution retraining has a positive effect on improving students' Accuracy.

There was a statistically significant difference between the two groups (attribution retraining and control) in terms of Accuracy average scores (p<0.001) in that Accuracy mean score in attribution retraining is significantly higher than that of the control group. In other words, fifty five percent of the observed variance in the experimental group was due to the independent variable (attribution retraining). According to effectiveness of chi Eta 39.7 percent changes due to attribution retraining.

Second hypothesis: rhythmic movement training has a positive effect on improving students' Accuracy.

There was a statistically significant difference between the Accuracy mean scores of the control group and the rhythmic-movement-training group at p<0.001 significance level. That is, the mean score of the Accuracy in the rhythmic movement training group was higher than that of the control group. More specifically, considering the size of the Etha square, it seems that some 43.5 percent of the observed variance in the experimental group was due to the rhythmic movement training.

Third hypothesis: there is a statistically significant difference between the extend of the effect of the two treatment methods, attribution training and rhythmic movement training, on the improvement of the Accuracy of the students.

After the treatment, the number of Accuracy -based misspelling problems in both experimental groups (attribution retraining and rhythmic movement training) was meaningfully lower than that in the control group (p<0.01).



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Moreover, there was no statistically meaningful difference between the two experimental groups in terms of the number of Accuracy -based misspelling problems (p=0.891).

#### **DISCUSSION AND CONCLUSION**

The present study was conducted to investigate the effect of attribution retraining and rhythmic movement training on improving students' Accuracy. The findings of this study showed that these two methods, attribution retraining and rhythmic movement training, along with other special training techniques used The Center for Remedial Instruction of the Students with Special Learning Disabilities, could have some positive effect on improving the Accuracy scores of the subjects and thus decrease the number misspelling problems they had. The results indicated that there was a statistically significant difference between the Accuracy mean scores of the subjects in the attribution retraining and rhythmic movement training groups, on the one hand, and that of the control group, on the other hand (p<0.001). The results obtained in the present study were congruent with those obtained by several other researchers including Soleyman Nejad and Shahraray (2000). In their study, they showed that when students realized that the success factors were internal to them, they were more likely to experience higher school achievements because they had higher expectations of themselves. Moreover, Tolland and Bolin, in their study, showed that attribution retraining led to higher levels of school achievement. The findings of this study are, also, compatible with the findings of Jennifer el and Kopper's study(2013) on the effectiveness of rhythmic movement on the performance of students with learning disabilities. They concluded that rhythmic movement, as a treatment technique, is comparable to the common play therapy programs. In the same vein, Kave Moghadam & Mahnaz Staki (2011) in their study concluded that Students with learning disabilities have a variety of problems such as difficulties with vision and visual perception and spatial orientation, Understand neuropsychological studies indicate that this group of students that is able to activate both hemispheres of the brain plays an important role in improving the problems of this group of students. These findings are consistent with research and since the dance sport as a neuropsychological intervention improves brain and its functions. Thereby improving the accuracy of students, the sequence of movements necessary to remember that regular aerobic and implementation Improves cognitive capabilities of students. Tolland & Boil (2011) in their study, they showed that Attribution retraining leads to more success in school. The results also indicate that there is no statistically significant difference in the improvement of the accuracy of spelling error attribution retraining groups with special training and athletic movements with no special training (p=0/891). Karkou (2010) Such a conclusion that remedial action is a way to foster verbal ability and the non-verbal methods in patients at risk of social mobility and long-term learning difficulties. The findings of the present study showed that these two therapy methods, attribution retraining and rhythmic movement training, could be used as appropriate methods to improve the accuracy of the students. The most remarkable finding of this study was the significant reduction in accuracy -based misspelling problems which are the most frequently occurring types of spelling problems among students. The findings of this study are in agreement with theoretical underpinnings of attribution theory and brain flexibility theory. It seems very useful to incorporate these two therapy methods along with other neuro-psychological, and motivational factors into the teaching approaches for students with learning disabilities so that more stable and consistent advances could be made in this field.

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Table 1. The means and standard deviations of Accuracy in the attribution retraining, and control groups

variable	Group	number	Pre-tes	Pre-test		st	The difference of pretest and posttest		
			Mean standard deviation		Mean standard deviation		Mean standard deviation		
Accuracy	attribution retraining	15	8.46	1.80	1.06	1.03	7.40	1.63	
	Control	15	7.80	1.78	2.80	0.861	5.00	1.41	

Table 2. The comparison of Accuracy according to group

Dependent variable	Sum of squares	Degree of freedom	Mean square	Statistic f	Degree of probability	Eta square	Test power
Accuracy	43.20	1	43.20	18.43	<0.001	0.397	0.985

Table 3. The means and standard deviations of Accuracy in the rhythmic movement training and control groups.

variable	Group	number	Pre-test		Post-te	st	The difference of pre-test and post-test		
			Mean standard deviation		Mean standard deviation		Mean standard deviation		
Accuracy	Rhythmic movement training	15	8.86	1.68	1.20	1.08	7.66	1.71	
	control	15	7.80	1.78	2.80	0.861	5.00	1.41	



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Table 4. The comparison of Accuracy according to group

Dependent variable	Sum of squares	Degree of	Mean square	Statistic f	Degree of probability	Eta square	Test power
		freedom	-			-	
Accuracy	53.33	1	53.33	21.53	<0.001	0.435	0.994

Table 5. The means and standard deviations of Accuracy in the attribution retraining and rhythmic movement training groups

Variable	Group	number	Pre-test		Post-te	Post-test		The difference of pre-test and post-test		
			Mean standar deviation	<del></del>	Mean standa deviat		Mean deviatio	standard n		
Accuracy	attribution retraining	15	8.46	1.80	1.06	1.03	7.40	1.63		
	Rhythmic movement training	15	8.86	1.68	1.20 1.08		7.66	1.71		

Table 7. Pairwise comparison of the improvement of Accuracy in attribution retraining, rhythmic movement training and control groups

The target group	Groups for comparison	Difference in mean	Degree of probability
Attribution retraining	Rhythmic movement training	-0.266	0.891
	Control	2.40	0.001
Rhythmic movement training	Control	2.66	<0.001

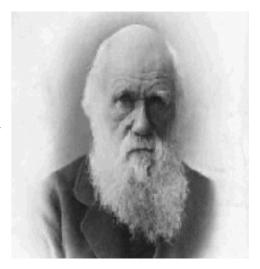


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#### **BIOGRAPHY - CHARLES ROBERT DARWIN**

Charles Robert Darwin's scientific achievement can be equaled by very few -- either for breadth or depth.

Biology came of age as a science when Darwin published "On the Origin of Species". Darwin's writing is remarkably clear and persuasive. His style of writing has a charm seldom encountered in scientific works. As Nicolaus Copernicus showed that the Earth has no privileged position in the universe, Darwin convincingly proved that human's ancestry is no different from the other animals. Darwin was ridiculed for his theory. Even Darwin himself towards the later part of his life was not very convinced of his theory. But today his theory is regarded as the cornerstone of modern biology. And as Julian Huxley said that Darwin's idea "is the most powerful and most comprehensive idea that has ever arisen on earth. It helps us understand our origins...We are part of a total process, made of the same matter and operating by the same energy as the rest of the cosmos, maintaining and reproducing by the same type of mechanism on the rest of life.



Charles Darwin was born on February 12, 1809 at Shrewsbury, Shropshire, England. He was the fifth child of Dr. Robert Waring Darwin, (the son of physician scientist Erasmus Darwin) and his wife Susannah, the daughter of the pottery magnate Josiah Wedgwood. Darwin's mother died in July 1817 when he was eight years of age and he was brought up by his sister, Caroline.

Darwin was enrolled in Dr. Butler's Shrewsbury School in 1818 at the age of nine. Darwin did not enjoy learning at school. For him, studies at his Shrewsbury School were a complete bore. Commenting on his school education Darwin wrote: "The school as a means of education to me was simply a blank. I learned absolutely nothing except by amusing myself reading and experimenting with chemistry". However, he had an intense curiosity about natural world. Since his childhood he developed a thirst for discovery and adventure. He liked to collect unusual objects both living and non-living. Luckily for Darwin his home was surrounded by woods and wildlife. The River Severn flowed right by The Mount, his family home. There were always things to discover, places to explore. He took interest in the birds, fish and frogs found in the surrounding areas. He had a great fascination for collecting beetles, the rarer the species the better. At the age of 13, he had even described, in a scientific journal, a new species he had captured in the neighborhood. In his autobiography he describes a particular beetle hunt in detail: "I will give a proof of my zeal: one day on tearing off some old bark, I saw two rare beetles and seized one in each hand; then I saw a third and new kind, which I could not bear to lose, so that I popped the one which I held in my right hand into my mouth. Alas it ejected some intensely acrid fluid, which burnt my tongue so that I was forced to spit the beetle out, which was lost, as well as the third one."

Darwin's father once said to him "you care for nothing but shooting dogs, and rat-catching, and you will be a disgrace to yourself and all of your family." But Darwin commented, "...my father, who was the kindest man I ever knew and whose memory I love with all my heart, must have been angry and somewhat unjust when he used such words".



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Darwin was influenced by his grandfather Erasmus Darwin (1731-1802), who was professionally a physician but he also established himself as a philosopher, naturalist and poet. Erasmus' books Zoonomia : or the Laws of Organic Life and The Botanic Garden or Lovers of the Plants were famous. Erasmus had even offered a theory of evolution. He helped found the Lunar Society. Its members called "Lunatics", met only during full moons, so that they find their way home in their horse-drawn carriages by bright moonlight. Among its members were inventor James Watt (1736-1819), the industrialist Matthew Boulton (1728-1809), the chemist Joseph Priestly (1733-1804) and potter Josiah Wedgwood (1730-95). Among Darwin's other heroes were Georges Cuvier (1769-1832), the great zoologist, Karl von Linne or Carolus Linnaeus (1707-78), who classified thousands of plants and animals and Alexander von Humboldt (1769-1859), the explorer who traveled over much of the world making discoveries.

In his early years Darwin developed interest in geology, zoology, botany and to a lesser extent in astronomy. Darwin's interest in natural science did not mean much to his father because there were hardly any jobs in natural science. After seeing that his son was not doing good at school Dr. Robert Darwin sent Charles to the University of Edinburgh to be trained as a physician. While studying medicine Darwin continued to pursue his old hobbies – beetle collection, bird watching and so on. He made friends with a few other scholars older than himself but having interest in natural history. Robert Edmond Grant (1793-1874), a Professor of Zoology, took him on field trips. John Edmonston, a talented taxidermist, taught him how to mount birds and mammals specimen for collection.

Darwin could not complete his studies in medicine, and it had to be abruptly terminated. As Darwin did not have the courage to face his father he took refuge with his maternal uncle Joshia Wedgwood II at the Wedgwood home called Maer Hall, at Staffordshire about 30 km from Shrewsbury. His maternal uncle who was very fond of him took him on tours of Scotland, Ireland, London and Paris much to the dislike of Darwin's father.

After seeing Darwin's failure at becoming a physician, his father sent him to the Christ's College, Cambridge in 1827 to study theology with a view to be ordained as a clergyman. But here again Darwin could not concentrate in his studies. Here he became attached with two scholars -- the Reverend Adam Sedgwick, a geology professor and the Reverend John Henslow, a botanist. The latter played a major role in shaping Darwin's career. Of his Cambridge years, Darwin says, "...my time was wasted, as far as the academic studies were concerned as completely as at Edinburg and at school." According to Darwin the only things he enjoyed in his studies at Cambridge were geometry, and the works of William Paley (1743-1805), a distinguished eighteenth century theologian. Darwin admired his beautiful logic and clear expression.

Darwin returned home from Cambridge in 1831 without having completed his studies. With Professor Henslow's encouragement Darwin had turned to be a promising naturalist and he had developed a specific interest in learning geology but he had no formal educational degree. At this stage something unexpected and dramatic appeared that was to change Darwin's life and also the course of scientific discovery forever. It was a letter from Darwin's favourite professor Henslow. Henslow was requested to help Robert FitzRoy, the captain of HMS Beagle to find a naturalist. Henslow himself wanted to join the expedition but after realizing the fact that he could not be away from his home, he offered the job to his brother-in-law, the Reverend Leonard Jenyns, a qualified naturalist. However, he also could not accept it



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as he was tied with Church responsibilities. After this Henslow wrote to Darwin urging him to take up the assignment. In a letter dated 24 August 1831 Henslow while explaining that the captain was seeking a young man to serve as ship's naturalist not a `mere collector' but also to be intelligent companion for the captain. He further wrote: "I consider you to be the best qualified person I know of who is likely to undertake such a situation... I state this not in the supposition of your being a finished naturalist, but as amply qualified for collection, observing and noting, anything worthy to be noted in Natural History.. Don't put on any modest doubts or fears about your qualifications, for I assure you I think you are the very man they are in search of."

It may be noted here that though FitzRoy is mostly remembered as "Darwin's Captain', he made his mark as seaman, explorer, surveyor, mapmaker and meteorologist. He also became governor of New Zealand. His family name is from the French fils roy meaning "son of the king". Robert FitzRoy graduated from the Royal Naval College at Portsmouth. He served on several vessels. In 1828, he was given the command HMS Beagle which had been sent to map the southern coasts of South America, including Patagonia and Tierra del Fuego. During his first command of Beagle (1828-1830) FitzRoy became interested in the Indian tribes of Tierra del Fuego and he brought four young members of the tribe including a nine-year old girl to England. His idea was to teach them English, and the plainer truths of Christianity, reading, gardening and "the use of common tools" and subsequently return them to their homeland. FitzRoy named the girl Fuegia Basket and the other three boys were called: York Minster, Boat Memory and Jemmy Button. One of the tribal youths, called Boat Memory died soon after reaching England. Among the other three Jemmy Button and Fuegia Basket made good progress in their learning and attracted the attention of the Press. After a few months of their stay in England FitzRoy wanted to take back these tribal youths to their homeland. The British Admiralty, however, did not show any interest in financing the project. But FitzRoy was determined to keep his word. Accordingly he took a year's leave and arranged the money for hiring a ship. At this juncture one of his uncles came in his rescue by persuading the Admiralty to sponsor another surveying voyage for the Beagle. The British Admiralty commissioned Beagle for a five-year voyage with the purpose of mapping the coasts of Patagonia, Tierra del Fuego, Chile and Peru and then continue on around the globe to survey longitudes. Besides other normal crew FitzRoy wanted a naturalist preferably a young one to accompany him. It was a common practice to take a naturalist on a voyage of this kind. The main purpose of engaging a naturalist was to provide intelligent and gentlemanly company for the ship's captain as British captains were expected to remain aloof from their hired crews. The post of naturalist was an upaid one.

Darwin was very much interested in taking up the job but his father was not in its favour. He said that no man of common sense would approve such a foolish idea. His father thought that his son was trying to escape the responsibility of preparing a sensible career. He advised his son to forget about it and return to Cambridge to complete his studies to be qualified as clergyman. So young Darwin had no option other than to inform Henslow his inability to accept the offer. However, Darwin did not give up the hope of convincing his father. His only hope was that his father had said, "If you can find any man of common sense who advise you to go, I will give my consent". Dawin went to his maternal uncle Josiah Wedgwood II (or uncle Josh as Darwin called him) to persuade him to convince Darwin's father. Josiah Wedgwood II after listening Darwin carefully explained the risks involved in such a journey. And after seeing that Darwin was not only aware of the risks but he was perfectly willing to accept them, Josiah Wedgwood II decided to take up the matter with Darwin's father. Darwin provided him a list of objections raised by his



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father. Josiah Wedgwood II wrote a letter answering every objection. In answer to the very first objection that the voyage would be "disreputable to (Darwin's) character as a clergyman" Wedgwood replied, "The pursuit of Natural History, though certainly not professional, is very suitable to a clergyman". Answering Dr. Robert Darwin's objection that "it would be a useless undertaking" Wedgwood replied, "Looking upon Charles as a man of enlarged curiosity it (the voyage) affords him such an opportunity of seeing men and things as happens to few". Darwin attached a separate note stating that he would accept his father's decision on the subject as final and "he would never mention the subject again". Instead of waiting for a reply Darwin and Josiah Wedgwood II went to Shrewsbury to meet Dr. Robert Darwin. Finally Dr. Robert Darwin consented and agreed to pay all Darwin's expenses.

The Beagle set sail on December 27, 1831. Darwin was only twenty two years old. There was no proper accommodation for Darwin. He had to share a cabin with the captain and there was virtually no room for keeping his instrument. Darwin wrote in his Journal: "The absolute want of room is an evil that nothing can surmount". Darwin was plagued with sickness throughout the voyage.

Darwin took four books with him for the journey – the Bible, a copy of Milton's work, Alexander von Humboldt's account of his exploration of Venezuela and the Orinoco basin and Volume One of Lyell's Principle of Geology. The other two volumes of Lyell's book was sent to him during the journey by Henslow. Darwin sent frequent reports on his observations to Henslow. Many of these reports were read by Henslow at meetings of the Philosophical Society of Cambridge.

The Beagle visited many lands in the southern Pacific seas before returning to England in October 1836 via the Southern Cape of Africa in an effective circumnavigation of the globe. The ship visited amongst other places the Cape Varde Islands, Brazil, Argentina and Chile.

After coming back from the voyage Darwin started working on his "Journal of Researches", a work based upon this journal which he had kept during the voyage of the Beagle. This was published in 1839 and become an immediate' success. The success of his first "literary child" always pleased Darwin more than that of any of his other books.

Following the continued deterioration of his health Darwin moved to a country residence at Downe, Kent. Darwin lived a life of a country gentleman of independent means among his gardens, conservatories, pigeons and fowls. However, he conducted extensive experiments especially in variation and interbreeding. It was at Downe that most of his life's work was done. Because of his continual health problem Darwin's activities were mainly confined to writing books. The books written by Darwin are given at the end of the article. The first of his major geological works., The structure and Distribution of Coral Reefs", was published in 1842. In this book Darwin presented a theory of the structure and mode of formation of coral reefs. Darwin's theory was very different from the one existed them. However, his keen observation and accurate thinking made his theory acceptable to most of the geologists. In fact his theory is even now generally accepted among geologists.

Darwin based on his observation of various facts of paleontology and biogeography, saw the possibility that species might not be immutable. But then he had no theory to work upon. However, he decided to apply the method adopted by Lyell in solving geological problems. Lyell had attacked geological



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problems by accumulating all applicable data in the absence of a working theory, in the hope that the sheer weight of facts might throw some light upon his problems. Darwin decided to adopt the same method to the species problem. Accordingly he started in July 1837 his work on variation in plants and animals, both under domestication and in nature. Darwin did not want to overlook any possible source of information. Thus he looked into personal observations and experiments, published papers of other biologists, conversations with breeders and gardeners, correspondence with biologists at home and abroad and so. Based on the analysis of accumulated facts from various sources Darwin realized that man's success in producing useful varieties of plants and animals depended upon selections of desired variation for breeding stock. However, Darwin had no clue on how selection could be applicable to nature.

But then he stumbled upon a theory to work upon. In October 1838, Darwin happened to read for sheer amusement "Malthus on Population". The book written by Thomas Robert Matlhus (1766-1834) was first published anonymously in 1789. It was titled An Essay on the Principle of Population. The book was not about biology. In his book Malthus proposed that human population increase geometrically (e.g., 2,4,8,16...), while means to support them increase only arithmetically (e.g.1,2,3,4,5...). Accordingly natural selective forces such as overcrowding, disease, war, poverty and vice take over to remove those who are not fit and thus only the fittest survive. Darwin extended Malthus's ideas and developed the idea of natural selection in species, a concept that is often referred to as "survival of the fittest". The phrase "survival of the fittest" is often used synonymously with natural selection. The phrase is both incomplete and misleading. The word survival is only one component of selection and perhaps one of the less important ones in many populations. Aso, the word 'fit' is often confused with physically fit. Fitness, in an evolutionary sense, is the average reproductive output of a class of genetic variation in a gene pool. 'Fit' does not necessarily mean biggest, fastest or strongest.

The theory of natural selection answers the question of who made the selection of what is to be evolved. The species that do survive in the competition for existence will go on to produce the next generation. The environment an organism lives in helps to determine which organisms survive and produce young, and which do not.

Commenting on Malthus's work, Darwin wrote: "In October 1938, that is fifteen months after I had began my systematic enquiry, I happened to read for amusement Malthus on Population, and being well prepared to appreciate the struggle for existence which goes on from long-continued observation of the habits of animals and plants, it at once struck me that under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. The result of this would be the formation of new species. Here, then, I had at last got a theory by which to work..."

However, Darwin took four years to write the first outline of his theory. This is because he had to collect a great deal of more data. In 1842 Darwin produced a pencil draft of thirty-five pages. By 1844 Darwin enlarged this draft to 230 pages. Early in 1856 following the advice given by Lyell, Darwin began his work on a much larger scale with a view to prepare a full account of his ideas on the origin of species. But while Darwin was half on its way in completing his work a certain development took place which forced Darwin for early publication of his work. Alfred Russell Wallace (1823-1913) sent Darwin a short essay on the "Tendency of Varieties to Depart Indefinitely from the Original Type" with a request that if Darwin



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think it worthy he should forward it to Lyell for his comments. Darwin liked it very much because he recognized his own theory in it. Darwin sent Wallace's paper to Lyell along with a covering letter. Darwin wrote: "Your words have come true with a vengeance – that I should be forestalled; if Wallace had my MS. Sketch written out in 1842, he could not have made a better short abstract". At one point Darwin decided to withhold his own publication in favour of Wallace. However, Lyell and Joseph Hooker (1817-1911) had for years been familier with Darwin's work on the transmutation of species. Lyell had read Darwin's outline of 1842. Lyell and Hooker therefore suggested that Darwin write a short abstract of his theory and that it be published jointly with Wallace's paper in the Journal of the Linnean Society. These papers appeared in that Journal in 1859 together with portion of a letter which Darwin had written to Asa Gray (1810-88), the great American botanist, in September 1857, in which Darwin set forth his views on natural selection and the origin of species.

In his autobiography, Darwin wrote: "Early in 1856 Lyell advised me to write out my views pretty fully, and I began at once to do so on a scale three or four times as extensive as that which afterwards followed by my Origin of Species: yet it was only a abstract of the materials which I had collected, and I had got through about half the work on this scale. But my plans were overthrown far early in the summer of 1858. Mr. Wallace, who was in the Malaya Archipelago, sent me an eassy "On the tendency of varieties to depart indefinitely from the original type" and this eassay (arrived June 18th) contained exactly the same theory as mine. Mr. Wallace expressed the wish that if I thought well of this essay, I should send it to Lyell for perusal. The circumstances under which I consented at the request of Lyell and Hooker to allow an extract from my own M.S., together with a letter to Asa Gray, dated September 5, 1857 to be published at the same time with Wallace's assay, are given in the Journal of the Linnean Society 1858 p. 45. I was at first very unwilling to consent, as I thought that Mr. Wallace might consider my doing so unjustifiable, for I did not then know how generous and noble was his disposition."

Following this Lyell and Hooker persuaded Darwin to prepare for early publication of a book on transmutation of species. Accordingly, he condensed the manuscript he had begun in 1856 to about one-third or even one-fourth its original size. The "Origin of Species" thus produced, was finally published in November 1859.

The original title of the manuscript was "An Abstract of an Essay on the Origin of Species and Varieties through Natural Selection". However, his publisher, John Murrey, persuaded Darwin to reduce this to On the Origin of Species, but Darwin insisted on keeping the words by means of Natural Selection as a kind of subtitle. Darwin also included on the title page the words Or the Preservation of Favoured Races in the Struggle for Life. Every copy of the original 1, 250-copies printed was sold on the VERY first day. Commenting on the success of Origin Darwin wrote:

"The success of the `Origin' may, I think, be attributed in large part to my having long before written two condensed sketches, and to my having finally abstracted a much larger manuscript, which was itself an abstract. By this means I was enabled to select the more striking facts and conclusions. I had, also, during many years followed a golden rule, namely that whenever a published fact, a new observation or thought came across me, which was opposed to my general results, to make a memorandum of it without fail at once; for I had found by experience that such facts and thoughts were far more apt to escape from the



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memory than favorable ones, owig to this habit, very few objections were raised against my views which I had not at least noticed and attempted to answer."

Darwin always referred to his Origin of Species as abstract. He wrote in its introduction: "This Abstract, which I now publish, most necessarily be imperfect. I cannot have given reference and authorities for my several statements, and I must trust to the reader reposing some confidence in my accuracy. No doubt errors will have crept in though I hope I have always been cautious in trusting to good authorities alone. I can have given only the general conclusions at which I have arrived, with a few facts in illustration, but which, I hope in most cases will suffice. No one can feel more sensible than I do of the necessity of hereafter publishing in detail all the facts, with references, on which my conclusions have been grounded; and I hope in a future work to do this. For I am well aware that scarcely a single point is discussed in this volume on which facts cannot be adduced, after apparently leading to conclusions directly opposite to those at which I have arrived. A fair result can be obtained only by fully stating and balancing the facts and arguments on both sides of each question; and this cannot possibly be here done."

Darwin is mostly known for his hypothesizing the pattern of common descent and proposing a mechanism for evolution -- natural selection. Darwin's theory of evolution is no longer just a theory -- an overwhelming amount of evidence has accumulated since Darwin. This it may be said that Darwin discovered a law as Copernicus, Galileo and Newton discovered laws -- natural laws. According to Darwin's law life has come into being and exists and is depended on the process of natural selection. In Darwin's theory of natural selection, new variants arrives continually with in population. Some of the variation may be neutral, but others help or hinder the organism in its struggle for survival. What Darwin did not know was the mode of inheritance.

Today we know that the true mode of inheritance was discovered by Gregor Mendel through his experiments on hybrid peas. In fact Mendel mailed his paper to Darwin, but Darwin never opened it.

The idea of evolution was not new to Darwin. Francis Bacon (1561-1626) in his book Novum organum (1620) noted the way in which species vary naturally from one generation to the next. Bacon observed that such natural variation could be used by the breeders of plants and animals to produce "many rare and unusual results:" Gottfried Wilhelm Leibniz (1646-1716), the German mathematician, speculated that species had changed because of difference in environmental conditions. Leibniz's observation was based on his studies of fossils and the possible relationship between the extinct ammonites and living species such as the nautilus. The term evolution was first used in its modern biological context in 1826 by Robert Jameson. In the eighteenth century Georges Louis Lecrec, Comte de Buffon (1707-88) suggested that the North American bison might be descended from an ancestral variety of ox that had migrated there. Darwin's grandfather Erasmus Darwin was convinced about the importance of evolution. However, Erasmus mistakenly though, that individual members of a species developed different characteristics during their, lifetime. And once acquired these advanced characteristics are passed on to their offsprings.

Jean-Baptiste Lamarck (1744-1829) proposed a theory of evolution in 1809. He believed that species arose continually from nonliving sources. These species were initially very primitive, but increased in complexity over time due to some inherent tendency. Such type of evolution is called orthogenesis. Further Lamarck proposed that an organism's acclimation to environment could be passed on to its



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selection.

# offspring. For example Lamarck thought proto-giraffes stretched their necks to reach higher twigs and which caused their offspring to be born with longer necks. This is known as the inheritance of acquired characteristics. Lamarck also believed that species never went extinct, although they may change into newer forms. Lamarck's ideas have been proved to be wrong. The observations made by a number of scientists implicitly included the concept of evolution and also the notion that species have evolved to fit their environments -- adaptation. Darwin offered an explanation of how evolution works – that is natural

Darwin's theory of evolution made him many enemies among orthodox scientists and churchmen since beliefs in the Creation and divine guidance were threatened by Darwin's revelations. Apelike cartoons of Darwin appeared in newspapers. Essays and sermons proliferated everywhere. Among the scientific opponents were Richard Owens, a renowned geologist at Oxford, Louis Agassiz at Harvard University in the USA and Adam Sedgwick, an old-school geologist from Cambridge. Darwin was not in a position to combat the furor, raised against his theory because of his continued illness. Moreover, he never recovered from the untimely death of his daughter Annie.

The task of defending his theory was left to Thomas Henry Huxley (1825-95), a brilliant zoologist who became famous as "Darwin's bulldog". Huxley did his job quite well notably at the famous Oxford debate on June 30, 1860, where Huxley confronted Samuel Wilberforce, the powerful Bishop of Oxford. Besides Huxley and Wilberforce those present on the platform included: Darwin's old teacher and anti evolutionist J.S. Huxley's friends Joseph Hooker and John Lubbock, John Draper of New York University and Sir Benjamine Brodie, the Queen's physician and President of the Royal Society. Seven hundred people were crowded into the University Museum where the debate was organized. In this debate Huxley instead of being ridiculed had won a wider interest and fair hearing for the new theories. Besides Huxley, Darwin's prominent supporters were Charles Lyell and James Hooker. Lyell though convinced that Darwin was correct but he refused to come out squarely in favour of evolution in his public statements and writings before 1868 when he embraced the theory at the age of 71.

Though the debate following the publication of the Origin of Species led to wide acceptance of Darwin's theory among the scientists but it was far from being established during Darwin's lifetime. The main reason for this was that Darwin could not explain how characteristics passed on from one generation to another and why there are variations from one individual to another. Variation is found among individuals who share the same parents. It is important to note that in the successive revisions to the Origin of Species Darwin himself backed away from natural selection. In the first edition of his Descent of Man Darwin wrote: "In the earlier editions of my "Origin of Species" I probably attributed too much to the action of natural selection or the survival of the fittest". The first reason for Darwin's retreat was the failure to explain the cause of variation, a key component in Darwin's theory of natural selection. The second important reason was the enormous timescale required for evolution. In the second half of the nineteenth century the scientists believed that the Sun could not have been hot for more than a few millions years as there was no process known to scientists which could supply energy to keep the Sun shining for hundreds of millions of years required for the variety of forms of life on Earth to have evolved through small steps. Scientists of the twentieth century have established that the long time-scale required for evolution by natural selection is not a problem as the Sun has essentially remained unchanged for about 4.5 billion years, a more than sufficient time for evolution to happen. Today we know that the



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energy is supplied by nuclear processes. In the twentieth century biologists developed an understanding of genetics and how characteristics are inherited by offspring from their parents. As mentioned earlier it was Mendel who had first initiated work in this direction. By the 1940s Darwin's theory of natural selection as spelt out in the first edition of the Origin of Species had become firmly established. So today, Darwin's theory of evolution and common descent are considered facts by the scientific community. Though debates continue how various aspects of evolution work. For examples, all the details of pattern of relationship are not fully worked out.

Evolution is regarded as the cornerstone of biology. While it is possible to do research in biology with little or no knowledge of evolution but then without evolution biology becomes a disperate sets of fields. Evolutionary explanations pervade all fields of biology and brings them together under one theoretical umbrella. The process of evolution can be summerised in three sentences: Genes (hereditary units) mutate. Individuals are selected. Population evolve. Evolution requires genetic variation. In order to continue evolution there must be mechanism to increase or create genetic variation and mechanism to decrease it. Mutation is a change in a gene. These changes are the source of new genetic variation. Natural selection operates on this variation. Natural selection favours traits or behaviours that increase a genotype's inclusive fitness. The opportunity or natural selection to operate does not induce genetic variation to appear. Selection only distinguishes between existing variants. Selection merely favours beneficial genetic changes when they occur by chance — it does not contribute to their appearance. The potential for selection to act may long precede the appearance of selectable genetic variations. Natural selection does not have any foresight. It only allows organisms for adapt to their current environment. Structures or behaviours do not evolve for future utility. An organism adapts to its environment at each stage of its evolution. As the environment changes, new traits may be selected for.

Darwin died on April 19, 1882 after prolong illness. Following a suggestion from of a group of members of British Parliament, he was accorded the honour of being buried in Westminster Abbey. (A burial place for English monarchs, outstanding statesmen etc). We would like to end this article by quoting Julian Huxley on Darwin. "Darwin's work...put the world of life into the domain of natural law. It was no longer necessary or possible to imagine that every kind of animal or plant had been specially created, not that the beautiful and ingenious devices by which they get their food or escapes their enemies have been thought out by some supernatural power, or that there is any conscious purpose behind the evolutionary process. If the idea of natural selection holds good, then animals and plants and man himself have become what they are by natural causes, as blind and automatic as those which go to mould the shape of a mountain, or make the earth and the other planets more in ellipses round the sun. The blind struggle for existence, the blind process of heredity, automatically result in the selection of the best adopted types, and a steady evolution of the stock in the direction of progress...Darwin's work has enabled us to see the position of man and of our present civilization in a truer light. Man is not a finished product incapable of further progress. He has a long history behind him, and it is a history not of a fall, but of an ascent. And he has the possibility of further progressive evolution before him. Further, in the light of evolution we learn to be patient. The few thousand years of recorded history are nothing compared to the million years during which man have been on earth, and the thousand million years of life's progress. And we can afford to be patient when the astronomers assure us of at least another thousand million years ahead of us in which to carry evolution to new heights". -Source by: Vigyan prasar



#### RESEARCH ARTICLE

## Compliance of International Standards ISO in Persian Abstracts of Professional Doctoral Theses in Zahedan University of Medical Sciences during 2013-2014

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#### **ABSTRACT**

**Objective**: The present study was conducted to evaluate the international standards ISO in Persian abstracts of the professional doctoral theses for Zahedan University of Medical Sciences during 2013-2014.

**Methodology**: This study is a documentary using content analysis. Data is collected by the international standard checklist ISO 214. The studied group includes 1200 Persian abstracts of professional medical, dental and specialist medical dissertations selected by census method. The collected data was analyzed by descriptive and inferential statistics, t-tests using SPSS software

**Results**: The findings showed that over 50% of the Persian abstracts are consistent with international standards ISO. The professional medical, dental and specialist medical dissertations complied the elements of ISO by 47.33%, 57.76% and 87.49%, respectively. Among selected elements of ISO, the highest compliance was related to the place of abstract (80.66%) and objective (71.76%) and the lowest was related to keywords driven from the text (46.96%).



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**Conclusion**: According to the results, compliance of the Persian abstracts is evaluated unacceptable for professional medical dissertations (<50%), poor for dental dissertations and very well for specialist dissertations. X² test showed a significant difference between scientific roots of professor and the extent of their compliance with international standards. In general, independent t-test also showed that the studied dissertations complied with more than half of the international standards for abstracting.

Key words: dissertation abstracts, abstracting, ISO 214, Zahedan University of Medical Sciences

#### INTRODUCTION

One of the goals of medical universities, in addition to train experienced and skilled manpower to meet the needs of health care, is to train researchers. That is why the general, specialist and post specialist theses are considered as valuable resources for research in the country. The increasing volume of scientific information is interpreted as an explosion of information. This volume of generated information, even in a specialized field, seems very difficult to study if not impossible. On the other hand, the authors wish to update their information, and in no time be aware of the content and essence of the writings and decide whether the examined evidence is in relation to its subject matter. This is a standard abstract which enables the researcher to reach a decision in a minimum time [1]. A good abstract of each document based on the International Standard ISO can be very important. The necessity of a standard abstract at every document, including dissertations as an important research resource is the product of information era and a good way for cultural development and expansion of innovative research. Any progress is a result of collection, abilities and available facilities and then organization of them for proper delivery to the researcher in order to help him for educational planning and research [2]. That is why many abstracting organizations of developed countries provide guidelines for abstracters based on their certain tasks and goals [3]. The most famous of these institutions is the ISO International Standard Institute.

#### Main problem

The main problem is that how Persian abstracts of theses submitted by the studied group comply with the international standards ISO?

#### **Problem Statement**

Zahedan University of Medical Sciences, with about 35,000 students in various health, nursing, paramedical, general medical, dental, and clinical specialist disciplines, is considered as one of the Type 1 universities. There are nearly 2800 theses at Central Library of the university which can potentially be an important source of research for researchers. By years of work in the Central Library, the author wonder why these resources are less used and, in some cases, they are not even considered. Considering the financial and temporal costs spent by the students and supervisors in the path of development of a thesis, non-optimal utilization of dissertations is regarded as a pity. Thus, this is important to address. As the researchers look for information relating to their subject and decide in the minimum time whether the documents are relevant, an abstract compliant to international standards seems of particular importance. The present study address that how Persian abstracts of theses comply with international standards ISO. Strategies of this study can be helpful in optimal qualitative and quantitative utilization of these resources. Considering the place of abstract in accelerating the access to information relevant to requirements, it is essential to use international standards in order to avoid dispersion and lack of integration of the materials.



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#### Components of ISO 214 for abstracting:

- 1. Objective: introduce the main objectives and domain of the study as well as the reasons of the study; unless, these are revealed from the title or other parts of the abstract.
- 2. Methodology: The methodology is described only to the degree that is necessary to understand content. However, new methods are described in a certain way.
- 3. Findings: The findings are described briefly and entirely, as much as possible. These findings may be theoretical or empirical results, gathered data, events and correlations, observations, etc...
- 4. Results: implications of the findings, in particular, how these are relevant to the purpose of research or used in preparation of evidence, are described. The results can be associated with recommendations, evaluations, applications, new relations and testing hypotheses.
- 5. Place of abstract: abstract is written in the language of the original document at the beginning of the document. In a journal, abstracts is particularly published in the first page. In reports which are separately published, the abstracts are on the report specification page; abstracts are monographic in books and they are printed behind the title page or on the following even page in dissertations.
- 6. Comprehensiveness: Abstracts should be comprehensive and concise, so that the reader will not need to refer to the document.
- 7. Accuracy: abstract should comply the content requirements, avoid ambiguity, and ignore the information not contained in the document itself.
- 8. Length of the abstract: Abstract of theses and reports or detailed documentation should be less than 500 words, preferably not exceed one page. Often, the contents of the document exceed the document. Abstracts of theses should be 250 words or less.
- 9. Style: The abstract begins with a sentence that expresses the main theme. Unless it comes in the title before the abstract.
- 10. The use of personal pronouns: in writing the main document, the third person pronoun is used.
- 11. Keywords
- 12. Keywords driven from the text: helps computer search.
- 13. Paragraphs and wording: abstract is not expressed in full sentences and appropriate words and phrases and verbs are used for association and coherence of the material.
- 14. Avoidance of non-standard abbreviations and terminology: If possible, try to use symbols and terms of the ISO or national standards [3].

#### **OBJECTIVES**

General Objective: To determine the extent of compliance of Persian abstracts of theses submitted in the Zahedan University of Medical Sciences with international standards ISO. Specific Objectives: To determine the extent of compliance of dental abstracts with standards; to determine the extent of compliance of general medical abstracts with standards; to determine the extent of compliance of medical specialist abstracts with standards.

#### **Problems**

- 1. How abstract of general medical theses comply with key elements specified in ISO 214?
- 2. How abstract of dental theses comply with key elements specified in ISO 214?
- 3. How abstract of medical specialist theses comply with key elements specified in ISO 214?



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#### **Hypotheses**

- 1. There is a significant relationship between compliance of abstracts with international standards and the scientific status of supervisors.
- 2. More than half of the abstracts of the studied dissertation comply with international ISO standards.

#### Conceptual and operational definitions

Abstract: according to Pao, abstract is an accurate compact of the important content of the document which provides objectives, scope and intensity and the major findings. Compression and transparency are is the key concepts of abstracting [3]. Standard: a level of quality of objects, activities, or base scale that must be met or be judged [3].

#### ISO 214 for abstracting

This standard published in 1976 in English and French provides guidelines for preparing abstracts of papers. This standard is used for abstracts prepared by authors of first-hand documents and publications, because such abstracts are both helpful for readers and can be published by minimum changes in services and second-hand publications [3].

#### LITERATURE REVIEW

Malek Mohammadi [4] concluded that Persian abstracts of doctoral theses for human sciences comply with international standards ISO (mean 39198% and standard deviation 13167%), which is the highest among departments of Science and Research, Islamic Azad University, Faculty of Humanities (mean 48188 and standard deviation 12168). He finally suggests a guideline based on international standard ISO for abstracting to optimize the performance of theses in the global information retrieval systems.Ramezani [5] concluded that abstracts of medical specialist theses submitted by Kerman University of Medical Sciences comply with the ISO (53.6%).Mokhtari [4] evaluated the compliance of abstracts submitted in universities of medical sciences with ISO 214. He came to the conclusion that medical articles comply the abstracting international standards (mean 83.9% and standard deviation 19%). The highest compliance was related to the place of abstract (100%) and the lowest was related to the start of the abstract (37.3%).Diba [6]compared the Persian abstracts of M.A theses submitted in the University of Imam Sadiq (AS), during 1989-2003 (mean 71.9579%, standard deviation 12.2459). As the findings show, the highest level of compliance was related to department of political sciences (mean 74.6667 and standard deviation 10.3744%).

Hafizi Ardekani [7] determined the compliance of MA theses submitted in the University of Tehran and Tarbiat Modares with abstracting standards during 1995-1997. He found that abstracts of theses submitted by Tehran University are better compliant than that of Tarbiat Modares. In both universities, more than half of the standards were met by 58.6%. In terms of selected ISO standards, the highest level of compliance was related to results and the lowest was related to comprehensiveness [7]. According to Dahl [8] studied on 50 abstracts of political sciences theses. As he found out, the paragraphs of these abstracts were semantically impaired and the sentences were not complete; therefore, different interpretations were made from results and findings. Failure to adhere to these indicators reduced the performance of these abstracts [9]. According to Koompan [10], standard abstracts make readers interested in a long text and decide quickly whether the text is suitable for reading. Tibbo [11] compared 120 abstracts of chemistry and psychology theses and history theses in terms of compliance with ISO standards. He concluded that 90% of the ISO standards were not met in chemistry and psychology theses, while 40% of the standards were met in the history theses. He claims that scientific texts can comply with the international standards in terms of results, objectives and findings in the form of complete and concrete sentences, while this is not true for history texts. Melander et al [12] examined 190 abstracts of theses in the field of medicine, biology, and applied linguistics. Biologists less comply with the international standards than two others and focus on methods and results. Biologists do not use personal



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pronouns, instead they use passive phrases. While in abstracts of medical sciences and applied linguistics, about 70% of abstracting standards are met. Ghane and Amiri [16] examined the level of compliance of Persian abstracts submitted in the Shiraz University with international standard ISO. They concluded that more than half of the theses comply with the ISO standards and doctoral theses are in a very good place. The highest level of compliance was related to objective (89.1) and the lowest was related to keywords (5.3). Vazir-Poor-Keshmiri and Sedehi [9], compared the Persian abstracts of theses submitted in the Azad university of Tehran. They found that doctoral theses are in a better compliance with international standards than MA theses. The findings showed that the highest level of compliance was related to the place of abstract and the lowest was related to keywords and keywords driven from text. He found a significant relationship between scientific status of supervisors and compliance of abstracting standard [17].

#### **METHODOLOGY**

To review abstracts of the theses available in the Central Library of the Zahedan University of Medical Sciences and compare with international abstracting standards ISO 214, 1200 theses of the last 10 years (from 2003 to 2013) were initially studied. In a previously prepared check list, 14 components of abstracting standard ISO were listed. The components were assigned 1 if existed; otherwise, 0. By software SPSS, findings were analyzed by mean and standard deviation. The present study was conducted by a descriptive-analytic methodology. Hypotheses were tested by t-test and Chi-square test. The abstracts which had less than 50%, 50-60%, 60-70%, 70-80% and more than 80% compliance were evaluated unacceptable, weak, average, good and very good, respectively.

#### **RESULT**

In relation to the problem on compliance of the general medical abstracts with international standards ISO, the following data was extracted, as shown in Table 1. According to the statistical data contained in Table 1, general medical abstracts had the highest compliance with the place of abstract (92.8%), keywords (65.1%) and objective (63.8%) and the lowest compliance with the use of personal pronouns (25.3%) and paragraphs and wording (34.2%). In relation to Problem (2), the following findings were obtained. As shown in Table (2), Persian abstracts of medical specialist theses had the highest compliance with some abstracting standards (97% objective, 97% findings and 95% results), while the lowest compliance with others (75.8% the use of personal pronouns and 73.03% accuracy). As the table shows, specialist abstracts complied with more than 80% of the components and thus they are evaluated very well. In relation to Problem (3), the following findings were obtained. According to the data listed in Table 3, the highest and lowest level of compliance of dental theses with abstracting standards ISO were related to conclusion (89.1%) and paragraphs and wording (25.5%), respectively.

#### **Hypotheses**

To examine the relationship between scientific status of supervisors and compliance with international abstracting standards, statistical data was initially extracted from Table 4. Theses which complied with 50-60% of the international standards were weak, with 60-70% were average, with 70-80% were good and with 80% were very good. In connection with the hypothesis that there is a significant relationship between evaluation in accordance with international standards 214 and scientific status of professors, Chi-square test was used to support the hypothesis. Statistical results can be seen in Table (5). According to the results from X<sup>2</sup>-5.56X<sup>2</sup> test, the hypothesis is supported at a confidence interval 0.095 and sig = 0.01. Therefore, the higher scientific status of supervisors, the higher compliance of Persian abstracts with international standards ISO.In relation to hypothesis 2 that more than half of the Persian abstracts comply with international standards ISO,statistical data was extracted from Table 6. Using data from tables, hypothesis 2 was tested by a single sample t-test, the results of which can be seen in Table 7. As the above table shows, t-test indicate that more than half of the abstracts of the theses submitted in the Zahedan University of



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Medical Sciences comply with universal abstracting standards ISO 214. According to the investigated components (14), the mean is considered equal to 7 (compliance 1 and incompliance 0). In the studied group, the mean compliance is 8.47>7. Thus, the hypothesis is supported (0.05).

#### **DISCUSSION AND CONCLUSION**

Standard abstracts make the researchers interested in study of long writings by which they can decide whether the writing worth the study [15]. Present study reviews 1200 Persian abstracts of theses submitted in Zahedan University of the Medical Sciences during 2008-2012 and compares them with the universal standards ISO 206 for abstracting. In general, abstracts of the graduate theses poorly comply with universal standards (64.19%). Hypothesis 2 also show that slightly more than half of the theses comply with international standards ISO. The lowest level of compliance is related to general medical theses (mean 47.33% and standard deviation 17.26%) and the highest level is related to medical professional theses (mean 87.49% and standard deviation 7.40%). As Ali Ramezani [5] showed for Persian abstracts of specialist medical theses submitted in University of Kerman, 53.6 theses are in better compliance with standards of abstracting (mean 83.9). The present study is consistent with Mokhtari [4]. Let us assume the general medical and general dental theses equivalent to master theses; Vazir-Poor-Keshmiri and Sedehi [9], Ghane and Amiri [13] and Malek Mohammadi [3] showed that more than half of abstracts related to the human sciences were in better compliance than abstracts of medical and dental theses. While Tibbo [11] claims that texts of empirical sciences have higher inherent ability than human sciences in abstracting. This can be attributed to the high population of general medical and dental students and concerns of the supervisors. The highest compliance with international standards ISO 214 was related to the place of abstract (mean compliance 80.66) and objective (71.88), which is consistent with Malek Mohammadi [3] and Vazir-Poor-Keshmiri [9] in terms of place of abstract and Ghane and Amiri [13] in terms of objective. The lowest level of compliance is related to keywords driven from text (mean 46.96) which is consistent with Ghane Amiri [13], Vazir-Poor-Keshmiri [9]. The present study found a significant relationship between scientific status of supervisors and the rate of compliance of Persian abstracts with standards. This is consistent with Vazir-Poor-Keshmiri and Sedehi [9]. Nearly 75% of people who achieved high academic status over the last five years, and abstracts of theses supervised by these professors highly developed in quality; therefore, we can indirectly conclude that abstracts became better year by year, as demonstrated by the aforementioned studies. Measures to further compliance of abstracts with international standards increase the utilization of contents of theses, and thus enhance their credibility.

#### Recommendations for the studied organization

- 1. The authors are obligated to comply the rules and instructions of International Standard ISO
- 2. The existing guidelines is modified by the International Standard ISO
- 3. An abstracting department is founded and specialists are used in order to edit the abstracts of academic theses for optimal utilization
- 4. Standard English abstracts of the theses are provided in order to inform the abroad universities.
- 5. Supervisors pay more attention to writing of the professional doctoral theses particularly for more compliance of the abstracts with international standards for better application of domestic and abroad users.

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Table 2: distribution and compliance of general medical abstracts with international standards ISO

	International standards	Yes		No		Mean	Standard
	international standards	Distribution	%	Distribution	%	iviean	deviation
1	Objective	485	63.8	275	36.2	1.3618	0.48085
2	Methodology	328	43.2	432	56.8	1.5684	0.49562
3	Findings	325	42.8	435	57.2	1.5724	0.49506
4	Results	368	48.4	392	51.6	1.5158	0.50008
5	Comprehensiveness	274	36.1	486	63.9	1.6395	0.48047
6	Place of abstract	705	92.8	55	7.2	1.0724	0.25927
7	Accuracy	265	34.9	495	65.1	1.6513	0.47687
8	Length of abstract	385	50.7	375	49.3	1.4934	0.50029
9	Style	245	32.2	515	67.8	1.6776	0.46769
10	The use of personal	192	25.3	568	74.7	1.7474	0.43481



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	pronouns						
11	Paragraphs and wording	354	46.6	406	53.4	1.5342	0.49916
12	Keywords	495	65.1	265	34.9	1.3487	0.47687
13	Avoidance of non-standard abbreviations	354	46.6	406	53.6	1.5342	0.49916
14	Keywords driven from text	260	34.2	500	65.8	1.6579	0.47473

Table 3: distribution and compliance of specialist abstracts with international standards ISO

	International standards	Yes		No		Mean	Standard
	Titlerilational standards	Distribution	%	Distribution	%	ivicari	deviation
1	Objective	160	97	5	3	1.0303	0.17194
2	Methodology	152	92.1	13	7.9	1.0788	0.27023
3	Findings	160	97	5	3	1.0303	0.17197
4	Results	157	95.2	8	4.8	1.0485	0.21544
5	Comprehensiveness	140	84.4	25	15.2	1.1515	0.35964
6	Place of abstract	150	90.9	15	9.1	1.0909	0.28835
7	Accuracy	121	73.3	44	26.7	1.2667	0.44356
8	Length of abstract	152	92.1	13	7.9	1.0788	0.27023
9	Style	145	87.9	20	12.1	1.1212	0.32737
10	The use of personal	125	75.8	40	24.2	1.2424	0.42985
	pronouns					1.2424	0.42900
11	Paragraphs and wording	135	81.8	30	18.2	1.1818	0.38687
12	Keywords	145	87.9	20	12.1	1.1212	0.32737
13	Avoidance of non-standard	145	87.9	20	12.1	1.1212	0.32737
	abbreviations					1.1212	0.32/3/
14	Keywords driven from text	134	81.2	31	18.8	1.1879	0.39180

Mean compliance 87.49

Table 4: distribution and compliance of dental abstracts with international standards ISO

		Yes		No			Standard deviation
	International standards	Distributio n	%	Distributio n	%	Mean	
1	Objective	150	54.5	125	45.5	1.4545	0.49884
2	Methodology	149	54.2	126	45.8	1.4582	0.49916
3	Findings	175	63.6	100	36.4	1.3636	0.48192
4	Results	245	89.1	30	10.9	1.1091	0.31232
5	Comprehensiveness	120	43.6	155	56.4	1.5636	0.49684
6	Place of abstract	160	58.2	115	41.8	0.4182	0.49416
7	Accuracy	170	61.8	105	38.2	0.3818	0.49672
8	Length of abstract	152	55.3	123	44.7	1.4473	0.49812
9	Style	153	55.6	122	44.4	1.4436	0.49772
10	The use of personal pronouns	160	58.2	115	41.8	1.4182	0.49416



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11	Paragraphs and wording	165	60	110	40	1.4000	0.49079
12	Keywords	175	63.6	100	36.4	1.3636	0.48192
13	Avoidance of non-standard abbreviations	180	65.5	95	34.5	1.3455	0.47638
14	Keywords driven from text	70	25.5	205	74.5	1.7455	0.43640

Mean 57.76 and standard deviation 13.6

Table 5: the relationship between compliance of ISO 214 and scientific status of professors

Compliance with ISO 214		Compliance				
Scientific status of professors	Weak	Average	Very good	Total		
Professor	0	1	19	20		
Associate Professor	2	1	162	165		
Assistant Professor	45	854	216	1115		

Table 6: X<sup>2</sup> test to examine the relationship between scientific status of professors and compliance with ISO 214

Test	Level	Degree of freedom	Sig.
V2	5.65	3	0.01
\ \hat{2}	1200		

Table 7: distribution and compliance of abstracts with international standards ISO 214

	International standards	Compliance (%)	Distribution	Total mean
1	Objective	71.76	795	
2	Methodology	63.16	629	
3	Findings	67.8	687	
4	Results	77.56	770	
5	Comprehensiveness	54.83	354	
6	Place of abstract	80.66	1015	
7	Accuracy	56.66	556	
8	Length of abstract	66.03	689	8.47
9	Style	58.56	403	0.47
10	The use of personal pronouns	53.1	477	
11	Paragraphs and wording	62.26	654	
12	Keywords	72.2	815	
13	Avoidance of non-standard abbreviations	60.36	679	
14	Keywords driven from text	46.96	464	



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#### Table 8: one-sample t-test for analysis

Total mean	Standard deviation	t-test	Degree of freedom	Sig.
8147	0.95	30.45	1197	0.000

