

Full Length Research Paper

The impact of areas of multiple intelligence on entrepreneurial behavior

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This study examines the formation of entrepreneurial behavior through areas of multiple intelligence. The problem addressed by this research is, “do the multiple intelligence skills of entrepreneurs have any impact on their entrepreneurial ideas?” A quantitative research method was employed in this study. The universe of this study is comprised of 880 SME (Small and Medium Size Enterprises) owners operating in Elazig (Turkey). The sample of the study is 212 SME owners participating in the “Small and Medium Industry Development Organization New Support Package Information Meeting” held by the Elazig Chamber of Commerce and Industry on 08.07.2010. One sample t test, correlation test and regression test were used for evaluation of the findings. Research findings indicated that the “multiple intelligence skills of entrepreneurs have a significant decisive impact on their entrepreneurial ideas”.

Key words: Multiple intelligence, small and medium size enterprises, entrepreneurial behavior, entrepreneurship, entrepreneurship culture.

INTRODUCTION

Observations related to Turkish entrepreneurial culture give rise to thought that the Turkish educational system does not support the formation and appearance of entrepreneurial characteristics. The “Left brain focused education system”, the system used in Turkey, “which is based on memorization and which pushes creative brains out of the system”, accustoms people to inertia. What is meant by being accustomed to inertia is “avoiding innovations and risks and preferring comfortable and guaranteed jobs”. One of the negative aspects of this situation is the likelihood that the development of an “entrepreneurial personality” will remain weak.

Traditional education approaches have dominated in Turkey for a long time (Karal and Sahin, 2008). Methods aimed at transferring/informing rather than searching/discovering were dominant in the education system (Vural, 2004). Therefore, until relatively recently, only

practices based on verbal-linguistic and logical-mathematical intelligences were appreciated (Özmen, 2006). These practices led to situations such as inappropriate career choices and resulted in a Turkish society in which few individuals displayed strong entrepreneurial spirits.

Education system insists on particular points of view depending on strict models. When education is based on ability and dominant multiple intelligence area rather than trying to fit individuals into particular patterns, left brain and right brain characteristics will be balanced and, accordingly, a society with a strong entrepreneurial spirit will be created (Demirel and Tikici, 2010). Every individual displays an intelligence that is a combination of their particular abilities, some of which may be more dominant than others. Such abilities comprise the elements of the multiple intelligence model, and cannot be fixed but may be developed and change over time (Barrington, 2004).

According to multiple intelligence theory, the purpose of education is to reveal and develop different multiple intelligence areas of students (Burma, 2003). Lazear (1994) stated that multiple intelligence areas could be

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developed in many ways at any age and development level; each intelligence area generally develops in a hierarchical order, starting in childhood and continuing into vocational life. In light of these ideas, this study considers the importance of a multiple intelligence-based education system and examines basic hypothesis concerning “existence of a positive relationship between multiple intelligence abilities and entrepreneurial behaviors”. The theoretical basis of “entrepreneurship”, “multiple intelligence” and “multiple intelligence – entrepreneurship relationship” are discussed and the basic hypothesis was tested via an experimental study.

Entrepreneurship

Entrepreneurship is a process that takes the lead in innovations and technical developments and contributes to economic growth (Schumpeter, 2008), whose balance is provided by supply and demand (Kirzner, 1997), and in which new information is converted into product and services (Shane et al, 2003). Entrepreneurship refers to the process of taking risks, producing and implementing an innovative idea of a measurable value (Turner, 2003). It refers to the establishment of innovative and economic enterprises with the objectives of profit and growth obtained under conditions of risk and ambiguity (Dollinger, 1999). Entrepreneurship is “perceiving an opportunity and the activity of creating an organization in order to take this opportunity” (Mueller and Thomas, 2000).

Multiple intelligence

Even though there are different definitions of intelligence, all of the theories related to intelligence meet on the common ground that intelligence is a capacity or potential which can be developed and which has biological bases. Intelligence is a combination the individual has innately, which is hereditary and concerned with the central nervous system. It is shaped by components stemming from experience, learning and environment. Intelligence involves the use of many mental abilities in different conditions (Tanimi, 2011).

Gardner's multiple intelligence, which is based on brain damages, suggests that human intelligence cannot be defined singularly. This theory radically revised classical understanding of intelligence and introduced the plural perspectives to the topic. According to this theory, individuals cannot be defined within a narrow framework as “intelligent, smart, stupid or incapable”. Every individual has a combination of particular abilities. Accordingly, individuals cannot be defined within a narrow framework; instead, they can be described as “different from one another”, where the source of difference is the dominant multiple intelligence area/areas (Gardner, 1983, 2006, 2007). Gardner (1983, 2006, 2007) argues that

intelligence refers to both the personal decisions and potentials of individuals. This potential comes out or develops according to cultural environment, values and opportunities. In this sense, multiple intelligence theory differs from traditional intelligence theories. Multiple intelligence is a theory based on the view “that people do not have just one mental ability, mental abilities are within a multiple structuring”. A human being has eight different mental abilities (intelligences). They are called “linguistic (verbal) intelligence, visual (spatial) intelligence, bodily (kinesthetic) intelligence, mathematical (logical) intelligence, intrapersonal intelligence, musical (rhythmic) intelligence, social (interpersonal) intelligence and naturalist intelligence. These areas of intelligence exist in every human being. However, the weight and degree of activity/inactivity in these areas of intelligence varies from person to person. The underdevelopment of one of the areas of intelligence will not make individuals “unintelligent” persons. Each individual has “intelligence” in at least in one of these eight areas of intelligence. One or several areas of intelligence in any human being may be more developed than those of other people (Gardner, 1983). The aforementioned areas of intelligence may be explained as follows (Gardner, 1983, 2006, 2007):

1. Linguistic (verbal) intelligence: The capability for and ability to use words effectively and logically in spoken and written language.
2. Visual (spatial) intelligence: The ability to imagine and visualize the objects around us.
3. Bodily (kinesthetic) intelligence: The capability of using the body for self-expression and the ability to use the hands for creating something.
4. Mathematical (logical) intelligence: The ability to use numbers logically and to establish cause and affect relationships.
5. Intrapersonal intelligence: The capacity for self-knowledge and the display of behaviors in accordance with this self-knowledge and understanding.
6. Musical (rhythmic) intelligence: The capacity for displaying sensitivity to sounds and to express oneself with music.
7. Social (interpersonal) intelligence: The capacity for and understanding of others' emotional states, senses, feelings and temperaments.
8. Naturalist intelligence: The ability to perceive, like and understand the surrounding natural world.

Multiple intelligence – entrepreneurship relationship

When definitions related to “entrepreneur”, “entrepreneurship” and “entrepreneurial personality” are examined, it is seen that concepts such as “imagination”, “innovativeness”, “creativity”, “presentiment”, “independence”, “risk-taking”, “opportunism”, “interiority”, “peppiness” and “being visionary” are used. Considering the characteristics managed by brain lobes, it is seen that right lobe is

identically defined with concepts such as “intuitive”, “innovative”, “creative”, “and imaginary”, “freedom” and “visionary” in a similar way to the entrepreneurial personality. It is among the most important research findings that individuals generally and predominantly using the right lobe of their brains generally learn by seeing and trying. From this point of view, the innovativeness and creativity characteristics of entrepreneurs come to mind. Amongst the more distinctive aspects of entrepreneurs in society is an ability to see and experience what others cannot, due to their life styles (Tikici, 2010). “Entrepreneurial personality” characteristics match up with the characteristics controlled by the “right part of the brain” to a great degree. In that case, it is not wrong to say that there is a positive relationship between “entrepreneurial personality characteristics” and “right brain characteristics”. This hypothesis was partly confirmed in the studies of Korkmaz (2000) and Demirel (2010). That is to say, characteristics led by the right brain are more decisive in the formation and development of entrepreneurial features when compared to the characteristics led by the left brain. This idea is supported by various studies which demonstrate that characteristics such as awareness, piecing together, creativity, synthesis, visual abilities (Springer and Deutsche, 1993), imagination, musicality, portrayal, sentimentality, holism, high tolerance for risk and independency (Gazzaniga and Heatherton, 2002; Sousa, 2000) are processed by the right-brain. However, it is not possible to claim that the power center of entrepreneurial personality is completely in the right part of the brain. Personality and acts of the individual are shaped by the effects of both parts of the brain. One part of the brain may be dominant since it functions better than the other part of the brain. Being successful and achieving what is desired requires the use of both parts of the brain. Accordingly, it is important to go through a multiple intelligence based education system and to strengthen the areas of multiple intelligence. Gardner, the founder of multiple intelligence theory, emphasizes that each characteristic displayed by an individual should not be considered as intelligence, only the characteristic which has following capacities should be called intelligence: “Capacity to adapt to environment, to solve problems encountered in the environment or to create a new product in any field”. Based on the idea expressed by Gardner, it can be stated that “entrepreneurship can also be considered as an area of intelligence”. Just as entrepreneurship can be expressed as an area of intelligence on its own, it can also be said that areas of multiple intelligence have decisive impacts on entrepreneurship. In that case, the relationship between areas of multiple intelligence and entrepreneurial characteristics can be interpreted based on the functions of cerebral hemispheres. According to the studies of Gardner (1983, 2006, 2007), the following relationship can be stated between areas of multiple intelligence and cerebral hemispheres:

Individuals’ choice of an appropriate profession and

achievement of their career goals requires them to go through an educational process congruent to the multiple intelligence theory. Having an entrepreneurial spirit and choosing an entrepreneurial profession also requires making maximum use of multiple intelligence acquisitions. Shearer (2011) therefore stated that the effect of multiple intelligence practices produces four forms of practical benefits for career planning and development:

1. When there is good harmony between the tasks and multiple intelligence strengths of the individual, the possibility of having chosen/choosing the correct profession and chance of successful career development increase.
2. Multiple intelligence strengths and their development are an important factor for successful career choice and progress.
3. In career development, multiple intelligence strengths function as a bridge in addressing professional deficiencies along with the effect of environmental factors such as parents, teachers, guides and friends.
4. Proper management of multiple intelligence strengths minimizes the negative impacts of personal weaknesses on career achievement.

In parallel with the aforementioned ideas, Ezepue and Ezepue (2011) emphasize that multiple intelligence approaches should be used in order to form a society of individuals with developed critical thinking skills and strong entrepreneurial potentials who are willing to engage in development/developing. According to multiple intelligence theory, individuals learn more easily through practices related to the areas they are inclined to (musical, visual, verbal etc.). In this way, a great contribution is made to development of their critical thinking skills and entrepreneurial potentials.

Maramaldo (2011) points out that making use of multiple intelligence theory may help to develop both individual and organizational performance. Based on this expression, it can be said that developing and properly guiding multiple intelligence abilities may be similarly influential on entrepreneurship.

THE PURPOSE, IMPORTANCE AND METHOD OF THE STUDY

The present study was designed and conducted in order to answer the main question “do the multiple intelligence skills of entrepreneurs have any impact on their entrepreneurial ideas?” Multiple intelligence theory has been the subject of academic research since the idea was introduced by Gardner in 1983. In Turkey, multiple intelligence theory became a subject of increasing research interest in the late 1990s. At first, Turkish researchers examined the question, “What is multiple intelligence?” From the late 1990s, studies began to address questions such as “Why do you prefer multiple intelligence?” “How can the Turkish education system be strengthened via multiple intelligence?”, “How can teachers implement multiple intelligence-based systems in their classes?” and “How can the shortcomings of the current system be corrected via multiple intelligence?” (Kaya and Selçuk, 2009).

It has more recently been the subject of much research in the

field of business. The study of Erkus (2010) investigates the multiple intelligence – leadership behavior relationship, and the study of Saruhan and Turker (2005) examines the relationship between multiple intelligence and the graduate programs the student applies are two studies of the Turkish business and management literature. No study investigating the interaction between intelligence theories (other than multiple intelligence) and entrepreneurial behaviors was *encountered* in either the Turkish or the international literature. However, in the literature, there are studies examining the relationship between intelligence theories, other than the multiple intelligence, and leadership behaviors: Emotional intelligence – transformational leadership (Aslan, 2009; Dagli et al, 2008; Antonakis et al, 2009; Cote et al, in press); innovative leadership – cultural intelligence (Elenkov and Manev, 2009); global leadership – cultural intelligence ((Alon and Higgins, 2005). According to the records of the Council of Higher Education of Turkey, among theses in the field of business, those which examine entrepreneurship investigate the relationship between the entrepreneurship and variables such as life values, personality, leadership, culture, gender, innovation, creativity and opportunity seeking.

The findings of some studies on the relationship between intelligence and entrepreneurship are presented as follows: Emotional intelligence is an important determinant in distinguishing successful entrepreneurs from ordinary entrepreneurs (Baum and Bird, 2010). It was pointed out that entrepreneurial spirit was emotional intelligence in other words and, accordingly, is one of the strengths guiding successful entrepreneurs (Yelkikalan, 2007). A strong positive relationship was found between emotional intelligence and entrepreneurship (Zakarevičius and Župerka, 2010). Hurst et al. (2008) reported that entrepreneurial vision may be built over emotional intelligence. In Baum et al. (2003), a positive relationship was reported between practical intelligence and entrepreneurial processes and entrepreneurial characteristics. That is to say, practical intelligence is one of the strengths underlying high-performance enterprises under the management of successful entrepreneurs.

Even though the topic of multiple intelligence seems to be accepted as a valuable research topic, the fact that there are insufficient research findings related to the topic in management and business literature is considered to be an important deficiency. A great majority of the studies encountered within the management literature examined the relationships between intelligence characteristics such as “emotional intelligence and managerial intelligence” and leadership. Emotional intelligence is also intelligence characteristic whose relation with entrepreneurship is investigated. However, previous studies within the literature did not consider entrepreneurship within the framework of multiple intelligence theory which is based on the theory that intelligence cannot be considered singularly. The present study is one of the first studies, though not the first, in this field. It is hoped that it will be beneficial, since it brings a new perspective to the topic with its emphasis on the need for a multiple intelligence based education system in order to increase the number of entrepreneurs. In this way the present study will expand on the existing literature.

This study aims to contribute to the integration of multiple intelligence theory into school curricula of each grade, from primary education to higher education, and to make it part of the Turkish education system. In this way, more individuals will develop entrepreneurial spirits, thereby helping Turkey to reach the socio-economic level of developed countries. A quantitative method was employed in the present study. Following the theoretical framework formed, based on the findings in the literature, applications trying to answer the research question are expressed. Two scales were utilized in the study:

The first scale is “multiple intelligences developmental assessment scale” developed by Shearer (1996) and adapted to Turkish by Iflazoglu et al. (2009). This scale contains 93 items that

measure multiple intelligence skills (musical intelligence: 13 items; bodily intelligence: 10 items; mathematical intelligence: 14 items; spatial intelligence: 10 items; linguistic intelligence: 13 items; social intelligence: 13 items; intrapersonal intelligence: 7 items; naturalist intelligence: 12 items). Each one of 93 items has a 5 point Likert type response scale. “He/she does not know” or “He/she does not apply” choices exist for each item. These choices are accepted as missing values which make no contribution to the score. Scores taken by the participant for each sub scale were summed and the result was divided to the highest score value he/she could take. The range between 1.00 and 0.80 was accepted as very high percentage score, the range between 0.80 and 0.60 was accepted as high percentage score, the range between 0.60 and 0.40 was accepted as medium percentage score, the range between 0.40 and 0.20 was accepted as low percentage score and the range between 0.20 and 0 was accepted as very low percentage score.

The second scale is the entrepreneurial idea scale developed by one of the researchers for one of his/her previous studies (Demirel and Tikici, 2010). The scale contains 41 items that measure the entrepreneurial ideas. These items also have a 5 score Likert type response scale and they were assessed in the same way with the “Multiple Intelligences Developmental Assessment Scale”.

The universe of the study is 880 SME owners operating in Elazığ. The survey was administered to 212 SME owners among SME owners participating in the “Small and Medium Industry Development Organization New Support Package Information Meeting” held by the Elazığ Chamber of Commerce and Industry on 08.07.2010. One sample t test, correlation test and regression test were used for evaluation of the findings.

FINDINGS

Reliability

In reliability analysis, it was realized that all of the scales had Cronbach alpha values above acceptable reliability level. (entrepreneurship = 0.930; linguistic (verbal) intelligence = 0.747; visual (spatial) intelligence = 0.932; musical (rhythmic) intelligence = 0.834; mathematical (logical) intelligence = 0.877; intrapersonal intelligence = 0.919; bodily (kinesthetic) intelligence = 0.832; social (interpersonal) intelligence = 0.851; naturalist intelligence = 0.966).

Scale scores

Examining the Table 2 related to the scale scores below, it is seen that entrepreneurship scores of participants are “very high” while their scores related to the areas of multiple intelligence are “high”. Among areas of multiple intelligence, scores of visual and musical areas of intelligence draw the attention when compared to the others. Although, the linguistic intelligence score appears at “high” level, the result is not significant.

Correlation analysis

Correlation analysis results are presented in Table 3. Accordingly, there is a significant positive relationship

Table 1. Areas of multiple intelligence and the cerebral hemisphere they are related to.

Area of multiple intelligence	The cerebral hemisphere it is related to
Mathematical	Left
Bodily	Left
Spatial	Right
Linguistic	Right / left
Musical	Right
Social	Right / left (frontal lobes)
Naturalist	Right
Intrapersonal	Right / left (frontal lobes)

Table 2. Scale scores.

Scale	Highest total score that can be taken	Total scores of participants	Level	One sample t***
Entrepreneurship	43460	36602	0.8422*	t=3.364 p=0.001
Visual (spatial) intelligence	10600	8223	0.7758**	t=11.306 p=0.000
Musical (rhythmic) intelligence	13780	9756	0.7080**	t=7.114 p=0.000
Social (interpersonal) intelligence	13780	9256	0.6717**	t=5.841 p=0.000
Mathematical (logical) intelligence	14840	9883	0.6660**	t=6.044 p=0.000
Intrapersonal intelligence	7420	4852	0.6539**	t=3.072 p=0.003
Bodily (kinesthetic) intelligence	10600	6904	0.6513**	t=4.171 p=0.000
Naturalist intelligence	12720	8276	0.6506**	t=2.992 p=0.004
Linguistic (verbal) intelligence	13780	8573	0.6221**	t=1.822 p=0.074

*: Vey high; **: High; ***: test value = 0.60.

between entrepreneurship and areas of multiple intelligence.

Multiple regression analysis

It is understood that the multiple regression model is significant and areas of multiple intelligence have a decisive impact on entrepreneurial characteristics

approximately in the ratio of 40% ($r = 0.701$; $r^2 = 0.491$; corrected $r^2 = 0.399$; $F = 5.308$; $p = 0.000$).

According to Table 4, relative order of importance of impacts of areas of intelligence on entrepreneurship is as follows: musical intelligence, social intelligence, spatial intelligence, bodily intelligence, linguistic intelligence, intrapersonal intelligence, naturalist intelligence and mathematical intelligence. While decisive impacts of

Table 3. Correlation analysis.

Scale	Correlation	Strength of the relationship
Entrepreneurship	1	
Musical (rhythmic) intelligence	0,504 (p = 0.000)	Slightly weak
Visual (spatial) intelligence	0,484 (p = 0.001)	Slightly weak
Social (interpersonal) intelligence	0,479 (p = 0.002)	Slightly weak
Naturalist intelligence	0,468 (p = 0.000)	Slightly weak
Linguistic (verbal) intelligence	0,435 (p = 0.000)	Slightly weak
Intrapersonal intelligence	0,424 (p = 0.000)	Slightly weak
Bodily (kinesthetic) intelligence	0,382 (p = 0.009)	Relatively weak
Mathematical (logical) Intelligence	0,325 (p = 0.001)	Relatively weak

Table 4. Findings related to multiple regression equation.

Variable	Variables in the equation				
	Coefficients	Std. errors	Beta	t	Significance
Constant	1.101	0.557		1.960	0.050
Naturalist intelligence ^(A)	0.037	0.112	0.050	0.331	0.742
Intrapersonal intelligence ^(B)	0.067	0.104	0.094	5.911	0.000
Social (interpersonal) intelligence ^(C)	0.266	0.131	0.260	2.035	0.048
Linguistic (verbal) intelligence ^(D)	0.082	0.147	0.079	8.340	0.000
Visual (spatial) intelligence ^(E)	0.260	0.102	0.338	2.544	0.012
Mathematical (logical) intelligence ^(F)	-0.063	0.161	-0.055	-2.993	0.003
Bodily (kinesthetic) intelligence ^(G)	0.119	0.145	0.116	0.815	0.419
Musical (rhythmic) intelligence ^(H)	0.292	0.097	0.353	3.009	0.004
Equation of regression	Entrepreneurship = 1.101 + 0.037A + 0.067B + 0.266C + 0.082D + 0.260E – 0.063F + 0.119G + 0.292H				

musical intelligence, social intelligence, spatial intelligence, linguistic intelligence, intrapersonal intelligence and mathematical intelligence on entrepreneurship are significant, decisive impacts of bodily intelligence and naturalist intelligence on entrepreneurship are not significant.

Conclusion

Multiple intelligence was first used by Turkish researchers in the mid-1990s. The concept was researched mostly by pedagogues. No previous study in the Turkish or international literature has approached multiple intelligence from the perspective of management. It is considered important for the development of the literature to make future studies on the impacts of the areas of multiple intelligence on entrepreneurship as well as the studies on the interaction between different definitions of intelligence and concepts such as entrepreneurship and leadership.

Examining the research findings, it was thought that the

answer “multiple intelligence skills of entrepreneurs have a significant decisive impact on their entrepreneurial ideas” would be appropriate for the main research question. In other words, it can be said that the basic hypothesis, “there is a positive relationship between multiple intelligence abilities and entrepreneurial behavior” was verified.

Looking at the findings, it is observed that levels of participants regarding entrepreneurial ideas are “very high” while their levels regarding all areas of multiple intelligence are “high”. A multiple regression model which was established in order to reveal the interaction between entrepreneurial idea (dependent variable) and areas of multiple intelligence came to be significant. Areas of multiple intelligence have a decisive impact on entrepreneurial ideas in the ratio of approximately 40%. The “right lobe”, by its own, or together with the “left lobe”, affected the leading of areas of multiple intelligence except for mathematical intelligence among “musical intelligence, social intelligence, spatial intelligence, linguistic intelligence, intrapersonal intelligence and mathematical intelligence” having a significant decisive

impact on entrepreneurship level. It is thought that this result supports the view that “characteristics led by the right brain are more decisive in the formation and development of entrepreneurial characteristics when compared to the characteristics led by left brain”.

Another point that may be emphasized in the light of these findings is that: “Having a powerful army of entrepreneurs and becoming one of the developed countries is amongst the biggest goals of Turkey. In order to reach this goal, the Turkish educational system must be constructed in a way that is fundamentally based on multiple intelligence, and people must be trained in such a way that they can use both parts of their brains in a balanced way.” It is thought that the present study indicates the importance of this matter.

The present study has some limitations: The study was conducted with entrepreneurs from only one city, the sample was not sufficiently large and the concept of “entrepreneurship” was handled in terms of management literature (in a commercial sense). It may be appropriate to conduct future studies with participants from different cities, from different fields (apart from commercial entrepreneurs), from different cultures and with larger sample groups. In this way, it will be possible to acquire more detailed information based on comparative analyses related to the topic.

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