

Predicting Creative Problem-Solving Skill Based on Social Capital among University Students

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ABSTRACT

The purpose of present research is to Predict the creative problem-solving skill based on social capital among the students in Islamic Azad University, zones 8 and 12 in Iran The population included the whole students in zones 12 and 8 regions in Islamic Azad University. 1922 students were selected by cluster random sampling method. The research instruments were as follows: Cameron and Whetten's Creative Problem-Solving Skill questionnaire which consisted of 22 items with dimensions of logical problem-solving (Items 1, 2, 3, 4, and 5), creative problem-solving (Items 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15), and developing innovation (Items 16, 17, 18, 19, 20, 21, and 22) with Cronbach's Alpha of 0.82; and a questionnaire for social capital was constructed that have three dimensions of relational (Items 1 to 12), cognitive (Items 13 to 23), and structural (Items 24 to 32) with Cronbach's Alpha of 0.91. The results of the method of multivariable regression indicated that there is relationship between dimensions of social capital and creative problem solving skills among students. Social capital will able to predict creative problem solving skills among students. As well, relational capital by the amount of beta 0.27 and cognitive capital by the amount of beta 0.11 has explanatory power of variable of creative problem solving skills among students.

KEYWORDS: Social Capital, Creative Problem-Solving Skill, Students

1. INTRODUCTION

Bourdieu [1], who first raised the concept of social capital systematically, put forth that stable commitment is the result of compliment, respect, and friendship or is the result of guaranteed rights of membership in the institutions such as family, class, or school. Also, social capital is gained through the contacts within the social networks. For example, the members can access the information and the opportunities through informal links and friends. Furthermore, significant social capital as a social status or prestige can be the result of membership within certain communication networks, especially those with limited members [1, 2]. Bourdieu [1] believed that social capital is "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (p. 248). The Huber and Kipman [4] in a study on 7 to 11 years deaf and hard of hearing students observed that these students performed weakly in the chain, of numbers and vocabulary comprehension and words treasures. Coleman [5] thus cites approvingly the practice of Asian immigrant mothers who not only stay at home but often purchase second copies of school textbooks to help their offspring with their homework.

According to Putnam [6], social capital serves a number of functions such as allowing citizens to resolve collective problems more easily, greasing the wheels that allow communities to advance smoothly, and widening our awareness of the many ways in which our fates are linked. The networks that constitute social capital can also serve as conduits for the flow of helpful information that facilitates achieving goals. Baker [7] included both the individual and career success as the benefits of social capital. He underlined the factors such as talent, intelligence, effort, luck, employment, influence, organizational learning, democracy, prosperity, health, life span, etc. as the important role of network in individual's life.

A few of the reasons why social capital is paid considerable attention are as follows:

1. Individualism: Coleman [5] regarded it as the dream of the comprehensive modern society; the dream of a society comprising of independent individuals who act separately to achieve independent goals. This social system is a combination of these independent individuals' actions.

2. Talent: It depends on the human gene and plays a crucial role in his success. Environmental factors affect the gene in human [8].

3. Intelligence: Like talent, intelligence is also related to human gene. Underlining the fact that mind has a group nature and cannot be studied separately from brain, neurologists called it social mind [9].

4. Relationship: Human relationship is a necessary part for physical and emotional health [10].

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5. Effort: It is among the factors which plays an important role in human success.
 6. Luck: Studies revealed that lucky people form a network of relations to collect different kinds of information. This way they increase their chance of being in the right place at the right time [11].
 7. Employment: It is another advantage of social capital which is gained when one is within a social network. Empirical research indicated that people often find job via personal ties rather than formal channels. These personal ties help them stay longer in that job.
 8. Influence: One of the sources of power and influence in people is the power from the position and the organizational status which is waning now. Today's managers can enhance their success if, besides their technical functions, they establish a network of relationship [12]
 9. Financing: The results of studies revealed that 75 percent of the newly-established businesses supply their financial sources through informal contacts and "firms with embedded relations and high network complementarity are more likely to be deemed credit eligible and to receive lower cost financing" [13].
 10. Organizational learning: According to Pfeffer and Sutton [8], 70 percent of the knowledge learned in the work environment has been transferred through informal relations.
 11. Marketing and advertisement: It is a vital factor for a business to advertise its products for the target population [7].
 12. Democracy: In his study on democracy, Putnam [6] concluded that in Italy, the regions which have more economic growth are those with higher social capital that was all upon their local governments. However, the regions with low social capital are economically under-developed. In other words, without social capital, democracy is weakened or has never existed [7].
 13. Prosperity: Psychological studies revealed that there is a relationship between social capital and quality of life. Csikszentmihalyi [14] claimed that there is a relation between meaningful work and the quality of life, and prosperity.
 14. Health: Those with higher social capital and better social network are healthier both physically and psychologically.
 15. Life span. In their nine-year follow-up study of Alameda County residents, Berkman and Syme (1979) found that those with stronger social network ties live longer.
- Social capital has three interrelated dimensions: structural, cognitive, and relational [15].

- Cognitive dimension: The cognitive dimension of social capital refers to attributes like a mutual belief or shared paradigm that promotes a common understanding of collective goals and the proper ways of acting in the social environment [16] The social capital's cognitive dimension may enable knowledge sharing in the sense that stories, shared language, customs and traditions can bridge the tacit-explicit division as well as division in terms of; for example, old-timers-newcomers [17]. The cognitive dimension refers to those resources that provide shared representations, interpretations, and systems of meaning among parties. This includes shared language and codes as well as shared narratives, which increase the mutual understanding among individuals and help members to communicate more effectively :

- Structural dimension: The structural dimension of social capital focuses mainly on the density of networks and on bridging structural holes [2, 18]. Structural social capital facilitates information sharing, and collective action and decision making through established roles, social networks and other social structures supplemented by rules, procedures and precedents [19].

- Relational dimension: The relational aspect of social capital consists of having a strong identification with the collective [10] having a sense of reciprocity or obligation to contribute to the collective (Coleman, 1990)[10], and abiding by the norms of the collective [6] which are part of the collective's climate.

Social capital is an additional mechanism for enhancing knowledge transfer both within and between organizations [15, 20, 21, 22] found that organizational social capital would strengthen the positive relationship between access to business knowledge and organizational learning

On the other hand, these data indicated that organizational social capital weakened the positive impact of access to organizing knowledge on organizational learning. Adams' [22] data obtained from 591 subjects in two separate organizations provided support for the overall model indicating a relationship between social capital and mindful use, as well as a relationship between mindful use and organizational learning. Social capital is also an effective variable for having a creative problem solving skill among the students. The last several decades have been marked by societal turbulence and rapid social change [23, 24, 25]. This societal turbulence has been reflected in several organizational trends.

Creative problem-solving is a problem-solving process developed from creativity and cognitive psychology literature and has been found to increase team effectiveness [26] Changing demographics, social changes, and technological changes are major factors affecting organizations. Creative problem-solving is a problem-solving process that is able to address unclear or poorly defined problems, provide flexibility in choosing methods or pathways to a solution, and develop outcomes not currently available [27]. Having creative problem-solving skill is an essential life skill for students in today's complicated world. Students who are equipped with creative problem-solving skills can solve their problems in a creative manner and will make decision like an independent people and can decrease their dependency to their parents, as well as institute. It is also important to differentiate between routine and non-routine problems. Routine problems are ones that can be resolved by

replicating thinking that has occurred before. Thus, routine problems are not truly problems since there is not an obstacle blocking the transition between what is and what should be. Non-routine problems, on the other hand, are different from those solved previously, so creative thinking is required. Creative problem-solving goes beyond “simply retrieving something previously did in this situation” [28].

Whetten and Cameron [29] enumerated the three dimensions of creative problem-solving skill:

- Logical problem solving is a skill with four stages of defining the problem, creating alternative solutions, evaluating and selecting the alternative solutions, and performing and tracing the solutions.
- Creative problem solving is a skill which removes the limitations of the logical problem solving model using initiation and cognitive constraints. It has the four stages of preparation, establishment, illumination, and confirmation.
- Developing innovation frees the potential in people.

Chang et al. [30] found out that social capital can affect the product innovation via presenting new ideas. Chen et al. [31] explored that social capital can influence the creativity in the R&D projects.

Merlo et al. [32] revealed that there is a relationship between the dimensions of social capital (structural, cognitive, and relational) and creativity in the retailer stores. According to Yang [33] the role of social capital and cognitive structure in the technological innovation is significant and claimed that social capital can affect the company's innovations.

Xu [34] worked on the role of relational capital in shaping an entrepreneurial cognitive model of innovation. Maurer et al. [35] investigated the relationship between social capital and innovative performance mediated with knowledge transfer. In the study by Rocha et al. [36], they found out that the companies with higher social capital are more innovative both in process and product. Doh and Acs [37] also emphasized the positive relationship between social capital and innovation. The results of Zheng's [38] study bolded the there is a positive relationship between the relational components of social capital such as trust and cognitive norms and innovation. Smith [24] revealed the important role of social capital through forming social networks with friends, colleagues, and other interactions in accessing financial resources among innovators.

Wu et al. [39] explored the mediating role of intellectual capital, social capital, and entrepreneurial orientation in innovation. Chen [31] underlined the relationship between social capital and national innovation system. One of the major findings of Hauser et al. [40] was impact of social capital on the process of innovation. Tsai [41] also revealed that a website with high social capital has more absorptive capability when compared with the one with low or no social capital. In another study by Dakhli and Clercq [42], they found enough evidence to claim the impact of trust and relational activities on innovation. Cooke and Wills [43] found out that in a considerable amount of companies' financial plans in Finland, Ireland, and England, the creation of social capital had a relationship with the increase in business, knowledge and performance in innovation.

According to Giuliano [44], students with similar cognitive ability adopt the same problem-solving strategies. Kiessling [45] the key process in the in economic changes is the introduction of innovations and the innovator is an entrepreneur. In another study by MacPherson [46], he found a relationship between cognitive ability and problem-solving ability. Lee [47] investigated how dimensions of intellectual capital can affect the performance in innovative projects. Gatignon et al. [48] underlined the significance of the structural theories in creating innovations. Stuart [49] showed that the innovators' employment status in the technological structure of market can seriously influence Research and Development and the amount of innovation. Xu [34] has studied the impact of social capital on innovation. Sadler-Smith and Badger [50] emphasized the role of cognitive style on organizational learning. In another study carried out by Kim [51], he investigated how communicative behavior and cognitive theories can have an impact on problem-solving attempts. In a study on social capital and innovation in 440 industrial companies, Landy et al. [52] also concluded that different dimensions of social capital have a positive impact on innovation. Innovation and creativity are among the creative problem-solving dimensions in the study.

2. Research questions

- 1) Is there relationship between social capital and creative problem solving skills among students in university?
- 2) Is there relationship between dimensions of social capital and creative problem solving skills among students in university?
- 3) Which dimensions of social capital has explanatory power of creative problem solving skills among students, and how much is each.

2. MATERIALS AND METHODS

The research methods which were used in this study are: library research to access the theoretical framework and the related literature; Survey method to collect, classify, describe, and analyze the data. The population include the whole students in regions 12 and 8 in Islamic Azad University. 1922 students were selected by cluster random sampling method. The research instruments were as follows: Cameron and Whetten [53] Creative Problem-Solving Skill questionnaire which consisted of 22 items with three dimensions of logical problem solving (items 1, 2, 3, 4, and 5), creative problem solving (items 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15), and

developing innovation (items 16, 17, 18, 19, 20, 21, and 22) and Cronbach's Alpha of 0.82; and a questionnaire for social capital was constructed based on the Shiu [54], Sinha [55], Gorton [56] and Chattopadhyay [57] questionnaires with three dimensions of relational (items 1 to 12), cognitive (items 13 to 23), and structural (items 24 to 32) with Cronbach's Alpha of 0.91.

3. RESULTS

The data collected from the administration of the instruments were analyzed. These data included the different indexes of central tendency, variability and the distribution of the questionnaires and its components. The distribution of the student's scores in the given variables had tendency toward normality.

Regression of Social capital with a creative solving

To answer the research question "whether there is a relationship between social capital and creative solving?" the regression model is used. The regression model and its equation have reported in the table below.

Table 1 shows a correlation coefficient, square of the correlation coefficient or determination coefficient so that the rate of correlation between these variables is 0.39 and in the low-level. Also coefficient of determination indicates that 15% of the variations of dependent variables of creative solving have covered by social capital variable.

Significant level provided in table above given the value F that is equal to 306.6 and significance level is less than 0.01 and indicates the confirming the regression model and independent variable is able to predict their variations of variables. The correlation between social capital and the creative solving is equal to 0.39 and the determine coefficient 0.15. In the other word, 15% of the variations of variables of the creative solving covered by the independent variable of social capital.

Table 1.

The correlation coefficient	Square of the correlation coefficient	multiple Square of the adjusted correlation coefficient	Estimated standard error
0.397	0.157	0.157	6.954

Table ANOVA

	Sum of squares	Degrees of freedom	Mean square	F	Significant level.
Regression	14829.716	1	14829.716	306.654	0.000 0
The remaining	79358.451	1641	48.360		
Total	94188.167	1642			

Table 2. The coefficients of the independent variables in terms of the standard and non-standard values

Independent variable	not Standardized coefficients		Standardized coefficients	t	Significant level.
	B	Standard error	Beta		
Constant	26.549	0.884		30.038	0.000
Capital Social	0.216	0.012	0.397	17.512	0.000

Regression of aspects of social capital and solving

To answer question of the research "whether there is a relationship between the dimensions of social capital and solving?" regression was used. Regression models and its equation have reported in the following table. Table 3 shows multiple coefficient correlation, square of the multiple correlation coefficient or determination coefficient so that the amount of the multiple correlation is in moderate level between the above variables 0.40. As well the determination coefficient indicates 16% of variations of dependent variables of solving are explained by independent variable of dimensions of social capital.

Table 3. Summary of regression model of dimensions of social capital and solving

The multiple correlation coefficient	Square of the multiple correlation coefficient	multiple Square of the adjusted correlation coefficient	Estimated standard error
0.407	0.166	0.164	6.924

Table 4. Table ANOVA

	Total Squares	Degree of freedom	Square of average	F	Significant Level
Regression	15604.009	3	5201.336	108.482	0.000
Remains	78584.158	1639	47.946		
Total	94188.167	1642			

Significant level provided in table above given the value F that is equal to 108.4 and significance level is less than 0.01 and indicates the confirming the regression model and independent variable is able to predict their variations of variables. The multiple correlation between dimensions of social capital and solving showed that

relational capital with the beta 0.27, cognitive capital with beta 0.11 have explanatory power of the dependent variable.

Table 5. The coefficients of the independent variables in terms of the standard and non-standard values

Variable The Independent	not Standardized coefficients		Standardized coefficients	t	Significant Level
	B	criterion Error	Beta		
Constant	26.185	0.886		29.550	0.000
Relational Capital	0.366	0.042	0.273	8.773	0.000
Cognitive Capital	0.169	0.049	0.119	3.450	.001
Structural Capital	0.093	0.049	0.061	1.906	0.057

4. DISCUSSION AND CONCLUSION

The findings of the present study are that there is relationship between social capital and its dimensions and creative problem solving skills among students. Social capital will able to predict creative problem solving skills among students. As well, relational capital by the amount of beta 0.27 and cognitive capital by the amount of beta 0.11 has explanatory power of variable of creative problem solving skills among students. Chang [30] found out that social capital can affect the product innovation via presenting new ideas. Chen [31] explored that social capital can influence the creativity in the R&D projects teams. Merlo et al. [32] revealed that there is a relationship between the dimensions of social capital (structural, cognitive, and relational) and creativity in the retailer stores. According to Yang [33], the role of social capital and cognitive structure in the technological innovation is significant and claimed that social capital can affect the company's innovations. Xu [34] worked on the role of relational capital in shaping an entrepreneurial cognitive model of innovation. Maurer et al. [35] investigated the relationship between social capital and innovative performance mediated with knowledge transfer. In the study by Rocha et al. [36], they found out that the companies with higher social capital are more innovative both in process and product. Doh and Acs [37] also emphasized the positive relationship between social capital and innovation. The results of Zheng's [38] study bolded the there is a positive relationship between the relational components of social capital such as trust and cognitive norms and innovation. Smith [24] revealed the important role of social capital through forming social networks with friends, colleagues, and other interactions in accessing financial resources among innovators.

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Social capital, according to Putnam [6], serves a number of functions such as allowing citizens to resolve collective problems more easily; greasing the wheels that allow communities to advance smoothly; and widening our awareness of the many ways in which our fates are linked. The networks that constitute social capital can also serve as conduits for the flow of helpful information that facilitates achieving goals. In fact, the significant suggestion of social capital theory is that the network of relations forms a valuable source for the members to perform the social affairs

Bourdieu [1] who first raised the concept of social capital systematically, put forth that stable commitment is the result of compliment, respect, and friendship or is the result of guaranteed rights of membership in the institutions such as family, class, or school. Also, social capital is gained through the contacts within the social networks. In conclusion, the results of the present study suggest that the creative problem-solving skill can be enhanced among university students if their indices of social capital are well dealt with. There can be such studies in other countries and societies to investigate the ways to improve the creative problem-solving skill among students.

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