Investigating the Social Factors Related to University Students' Scientific Activism: A Case Study

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Abstract:
The purpose of this study is to examine the social factors related to students' scientific activism. This study uses survey, as a method, and its statistical population is all of undergraduate students of Shiraz University. Using Cochran formula, 370 students were selected. Data were analyzed using SPSS software. The factors influencing learning culture in the research are variables such as gender, educational and organizational factors, motivation and cultural capital. The results did not show any significant relationship between gender and scientific activism. But educational and organizational factors, personal motivation and cultural capital and its dimensions (embodied, objectified and institutionalized) have significant relationships with the dependent variable. The independent variables in the regression analysis were able to explain 33 percent of the variation of scientific activism.

Keywords: cultural capital; educational factors; organizational factors; scientific activism; students of Shiraz University.

1. Introduction:

Science is one of the most important tools for development. One society cannot achieve its goals in all dimensions without science. One the main factor which is influential in empowering governments and enriching civilizations is science. Will Durant in his *The Story of Civilization* categorizes knowledge under mental and spiritual factors and thinks of it as one of the most important constituents in the realization and establishment of civilizations (Quoted in Zahiri: 2010).

Nowadays the role of universities in most countries has changed; the mission of university is no longer just training skilled and specialized human force. However, universities and research institutes play the most vital role in the development, progression and solution of problems in a society. Third-world countries are not in a good condition concerning human force specialists in comparison to developed countries. One of the obstacles of research development is due to such attitudes to science as promotion, publication in famous world journals. Certainly in human history one other factor than high education has not been the foundation for constructive developments in human societies. It is quite clear that the leaders of scientific and social developments are those trained by high education.

Expansion of educational facilities (specialized journals, internet sites, …), access to sources of information, gradual removal of barriers to scientific sources (including geographical, temporal, cultural barriers..), development of communication technology, universities, institutes of higher education, intense competition for university entrance exams and widespread acceptance of students in the country (physical development) broach the question of how would be the performance of those who enter university after a tough competition and too much cost.

The difference between the current situation and the desired situation in the academic level of the students which is affected by their university culture is the most important issue to be followed in this study.

One of the serious barriers to dynamism in academic environments is the lack of curiosity and questioning spirit, which is followed by rote learning, passivity in research and academic activities, not participating in class discussions, lacking a critical spirit, priority of grades and degrees. Also as aftermaths of this issue one can refer to buying and selling of articles and theses, copying and academic plagiarisms at a large scale.

To look through a wider perspective these are not the final outcomes, with the institutionalization of such a spirit among students, the output of universities would be illiterate and unskilled individuals who are unworthy of management at various social levels.

On this ground Peter Drucker shows that the important economic resource and the most important factor of production in the modern world is neither capital, natural resources nor work and worker, but it is knowledge and will remain knowledge (Quoted in Attarzadeh, 2009). University, as an educational and research institute, is considered as one of the most important and influential players in this field which plays an important role in the innovative performance of a country (Attarzadeh, 2009).

Fundamental transformation in higher education, expanding theorizing seats, criticism and free-thinking, interdisciplinary studies, developing scientific poles and producing indigenous knowledge are among the key points of Fifth Development Plan (Fifth Development Plan Law, 2011). These ideals will not be realized if the learning culture of those engaged in education is not a dynamic one. Student-oriented, group works, opportunities for new ideas, resilience versus changes, free-thinking, and updating students' information are among the characteristics of a creative university (Mahbobi, 2008). The centrality of an active human is very important in the formation of such a university.

The ever-increasing development of science and technology in all fields of human life on one hand, and the man and society's vital needs for a better life and independence on the other hand, necessitates study and research in the field of the influential components on students' scientific activism (Alaei and A'zami,

2000). Also striking development and growth in the field of industry and technology in addition to national development planning and higher education, requires training committed and specialized manpower. To achieve this, scientific and permanent research should be conducted to identify the facilities, society's expectation of university and those measures by which universities can help develop the country in a desirable way (Sardary, 2002). Since teaching effectiveness and research productivity are complementary to each other (Marsh, 2002), research should be taken into account as one of the influential factors in scientific activism.

Therefore, due to the significance of students' scientific activism in the field of science and research as one of the important factors in the realization of the software movement, scientific development and knowing the obstacles in the way of micro and macro levels planning is worthy of analysis. Personal and narrow-minded outlook toward science (science for money, promotion and other social benefits) and a comprehensive outlook beyond one's own benefits (development of the society, gaining esteem and independence for the country, solving human problems and issues) are two different approaches toward science which are followed by different behaviors.

2. Literature Review

Hosseini (2000) in his thesis titled ' Understanding the scientific spirit of the social sciences MA students' scientific spirit of Tehran state universities' in a sample of 150 people concluded that their scientific spirit is average upward, and 71% of the respondents got between 54-70 out of 100, and 29% got between 71-87 and among the hypotheses of the study just two variables had direct and significant correlation with the scientific spirit: relationship with educated people and participating in scientific activities.

Feli et al (2006) in a research titled 'studying the influential factors on students' participation in research activities and the production of science' with a sample of 75 people of MA students of Tarbiat Modarres University's agriculture faculty, concluded that participation in research activities has a positive and significant correlation with the variables of outlook toward student research in the country, the scientific exchange among the students, access to research facilities, outlook toward financial status and the scientific qualification of the professors.

Javaherzadeh (2008) in a study titled 'the influential factors on the tendency of students toward research' at Brojerd Islamic Azad University, in a sample of 340 people concluded that factors such as research methodologies, professor's interest and seriousness in directing students' research activities, membership in scientific societies, lack of a certain status for research in university courses, faculty members' unfamiliarity with research, paying attention to research by propaganda and student research festival, library and easy access to the internet, lack of interest in one's field of study, lack of a suitable future job and the presence of research counselors at universities are effective on students' tendency toward research.

Kazemi et al (2008) studied the effect of social and psychological factors on the scientific activity of ShahidBahonar and Sistan and Baluchestan universities faculty members with a sample of 164 people. Findings showed that scientific atmosphere is telling on the scientific activity.

Zarifian and Mohammadi (1388) in a study measured students' tendency toward research and the influential factors on it among the senior students of agriculture faculty at Tabriz University. The sample size of this study was 100. Findings showed that there is positive and significant correlation between students' tendency toward research and using information resources, access to proper sources for research, average score, attitude toward one's field of study, curiosity and family.

BaghaeiSarabi and Esmaeili (2010) conducted their study titled 'the social factors affecting the students' academic identity at Islamic Azad University' at four branches of Rude Hen, Shahryar,

ShahreQods, Karaj and VaraminPishva with a sample of 380 people. Findings showed that the variables of cultural capital, academic culture and academic motivations significantly delineate the changes of academic identity. Academic identity and cultural capital were more influential in delineating academic identity respectively and students' academic motivations did not have a generalizable effect on academic identity.

FazlAllahi (2012) in a study titled 'Restrictive Factors Affecting Student Research' at TarbiatMoalem faculty of Qom Azad University with a sample of 200 people concluded that individual (specialized ones), motivational factors, research, structural-administrative and cultural services restrict student research. Lack of interest in research, lack of methodology workshops, emphasis on teaching rather than research, lack of specialized journals and reference of specialized field of study, lack of certain rules for evaluating students' research activities, and unavailability of experienced instructors for guiding student research are among the highest priority for restriction.

Another study by Jones et al (2000) titled 'Gender differences in students experiences, attitude toward science and scientists' was done in the US with sample size of 437. The aim of this research was studying students' attitude and their experiences in relation to science. This study was done to elicit students' understanding concerning science and scientists, the scientific experiences outside school, scientific discussions and the characteristics of future job. The findings showed that there is a significant and meaningful difference between the two genders in experiencing science and understanding lessons and attitude toward jobs.

Craker (2006) in a study titled 'the attitude of Wisconsin University students toward science' in a sample size of 397 people concluded that students may lose their interest in studying in their junior year and the number of prepared students to take hold of the jobs related to their field of study is decreasing. Various factors such as gender, the desirable success and previous scientific experiences may affect students' attitude toward science. The findings of this study showed the more self-confidence of men in comparison to women and women's more scientific understanding in comparison to men. In this study, desirable success and attitude toward science were highly interrelated.

Smeby and Try (2005) in a study titled 'administrative atmospheres and research activities of faculty members in Norway' found out that the atmosphere of the faculty, age and number of faculty members are effective on research activities.

Moss and Kubacki (2007) in a study titled 'Researchers in higher education: spotlighting a remiss in study?' at an institute of higher education in England studied the scientific activities in group and individually and their effects on the final performance through interviewing 15 students. Findings showed that individual activity lead to seclusion and negative effect on research.

3. Overview of Theories

There are various approaches toward the structure of science and its development, each of which emphasizes some specific components. For example extroverted approach is focused on institutionalizing the social relations of science and its different social functions in societies and the relationship between political, economic and social factors and the functions of scientific system. In this approach it is believed that scientific facts are affected by factors beyond science such as cultural, economic, political and especially social institutions (Tavakol, 1990). Merton and Blume belong to this approach. Merton, as the founder of sociology of science, has studied the rewarding system of science and believes that science as an institution has a certain rewarding system. He believes that universalism, communism, disinterestedness, organized skepticism are among the values of the scientific society (Kuhn, 1989:152). Gerard Degree in his analysis uses the concept of social and historical system, meaning that the progress of science in every historical era

depends on specific social factors. Borriss Hessen also believes that science is dependent on the emerging economic needs of the bourgeois (Quoted in Salehi and Ibrahimi, 1999).

Another approach believes that the progress of science is the result of the inner components of the scientific system such as the scientists, scientific journals, scientific relations and competitions and more important than all scientific community (Quoted in Iman, 2013). This approach does not take that much account of external factors. Among the proponents of this approach one can refer to Bernard Barber, who believed in the independence of scientific systems, Hagstrom and Storer (Salehi and Ibrahimi, 1999). Functionalism is another approach based on which the scientific system is analyzed. The most complicated analysis which is available on functionalism belongs to Talcott Parsons. He has benefited from the systematic approach and thinks of the society as a system which has four functional prerequisites which are vital for the survival of the system. First is adaptation with the external environment. Second is goal attainment. Third is an integration which keeps the internal order of the system. The fourth need is latency which motivates the group members to cope with their responsibilities (Edgar and Sedgwick,2009).Each one of the sub-systems deals with the one of the functions.

The cognitive approach mainly depends on the internal structure and expansion and development of scientific knowledge and the cognitive understanding and change of this approach is formed through the interaction of cognitive factors and the internal social structure. Cole, studying the development of science, considers two dimensions. According to the first dimension the institution of science is affected by either the internal or external factors, and the second dimension holds that whether this effect is social or mental (Quoted in Mohseni, 1998). This research tries to study the effect of external (educational and structural) and individual factors (motivation and cultural capital) on the students' scientific activism.

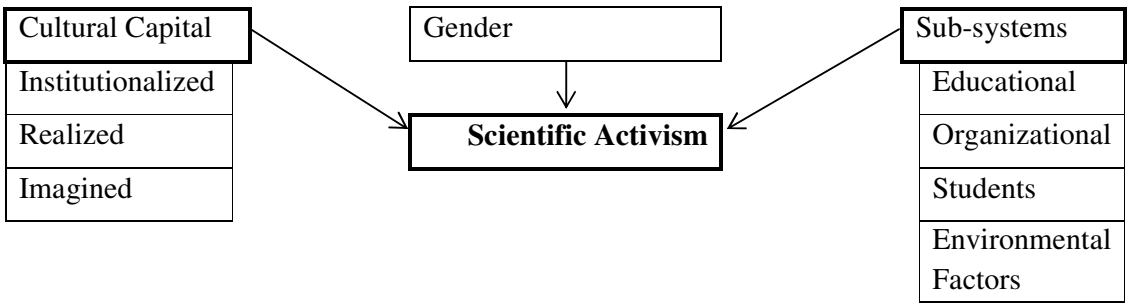
The theoretical framework of this study is based on the model of Parson's social action system. According to Parson's theory scientific environment has four micro systems and each micro system has a function as shown in table 1.

Table 1.

The micro system	***Functions***
Educational	Keeping Scientific Activism
Organizational	Integration and facilitation
Students	Goal Attainment
Environmental Factors	Adaptation

The micro educational system connects the students' personality system and organizational factors. The micro organization integrates the scientific activities and facilitates their affairs. The personality system of the students refers to the motivations for scientific activities which are affected by organizational and educational factors. The function of this system is goal attainment. The physical aspect of university should provide for scientific activities.

Research Model



4. **Hypotheses**

1. It seems that there is a relationship between gender and scientific activism.
2. It seems that there is a relationship between educational factors and scientific activism.
3. It seems that there is a relationship between organizational factors and scientific activism.
4. It seems that there is a relationship between individual motivation and scientific activism.
5. It seems that there is a relationship between environmental factors (material facilities) and scientific activism.
6. It seems that there is a relationship between cultural capital (and its dimensions) and scientific activism.

5. Method

The research plan of this study is through survey method. Data is gathered through questionnaire. Statistical Society: Includes all B.A students of Shiraz University. Sample size and sampling method: using Cochran formula and considering the parameters influencing it, the sample size is 370 people. Out of this 55% is girls (203 people) and 45% is boys (167people).

6. Definitions of Concepts

6.1.Scientific Activism: includes students' behaviors in the field of learning and knowledge which can be as follows:

Active learning, self-confidence for expressing personal viewpoint and challenging attitudes, learning to think critically and reflecting oneself, dialogue and discussion, participating in scientific communities, doing studying and research activities and participating in seminars and scientific debates.

6.2.Organizational Factors: they can neutralize, motivate or prevent scientific activities. Among its components one can refer to designing courses and chapters, the academic level of the instructors and etc.

6.3.Individual Motivation: motivation can be defined as the empowering, leading, and keeping factor. Put simply, motivation helps one go, keep going and decides where to go.

6.4.Cultural Capital: according to Pierre Bourdieu's theory, cultural capital means understanding ability and capability to benefit from cultural products in each individual, and it includes the sustainable trends of the individual which are agglomerated in him in the process of socialization. Cultural capital includes three dimensions:

6.5.The imagined dimension: includes the psychological trends of the individual in relation to cultural capitals.

6.6.The realized dimension: includes consuming cultural capitals.

6.7.Institutionalized dimension: includes the academic degrees and qualifications of the individual (Sharepour, 2002)

6.8.Environmental Factors: includes material resources for research and scientific activities and for the dynamism of the scientific atmosphere.

7. Findings

The validity of the questionnaire was determined formally. Also the reliability of the structures is shown in table 2.

Table 2. The Reliability of the Structures

Structure	*The Cronbach's alpha*
Learning Culture	.758
Educational Factor	.776
Environmental Factors	.782
Organizational Factors	.685
Individual Motivation	.795
Cultural Capital	.864

7.1. Descriptive Statistics

The descriptive results of the data show that 203 people (55%) of the respondents were women and 167 people (45%) of the respondents were men. The mean age was 21.08. 86.2 of the respondents were single and 11.9 were married.

The scientific activism mean of the students was 29.6. The level of half of the students' activism was equal to or less than 26 and the other half is higher than that. The scientific activism score of most students is 26 (average). The lowest score of scientific activism of the students is 8 and the highest is 72.

The cultural capital mean of the students is 36.9. Also the level of half of the students' cultural capital is 33 or lower than that and the other half is higher than that. The highest score of cultural capital of the students is 32 (a low score). The lowest level of cultural capital is 19 and the highest is 153. Out of the cultural capital dimensions, the imagined dimension with 16.67, the realized dimension with 11.82, and the institutionalized dimension with 7.29 are respectively observed among the students.

The educational motivation mean of the students is 30.41. The level of half of the students' motivation is 31 or lower than that, and the other half is higher than that. The highest score of motivation is 32 (average). The lowest educational motivation score is 12 (a low score) and its highest is 40.

7.2.Testing Hypotheses

According to the table 3, there is not a significant difference between the boys and the girls' scientific activism score, therefore this hypothesis is rejected.

Table 3. Scientific Activism difference in terms of gender

Gender	Number	Mean	Mean Deviation	Level of Significance t
man	167	26.87	8.61	1.772.077
women	203	25.46	7.173	

According to table 4 correlation test of scientific activism and cultural capital shows that in 44% of the cases there is a significant relationship between the cases. Also, the dimensions of cultural capital including institutionalized (in 41% of the cases), imagined (in 38%of the cases) and realized (in 40% of the cases) has a significant relationship with scientific activism. Therefore the fifth hypothesis was confirmed.

Table 4. Pearson Correlation between Scientific Activism variable and independent

Independent Variables	Correlation coefficient	Significance Level
Educational Factors	.397	.000
Organizational Factors	.273	0.058
Individual Motivation	.526	.000
Environmental Factors	.507	.000
Cultural Capital	.455	.000
Institutionalized Cultural Capital	.414	.000
Imagined Cultural Capital	.381	.000
Realized Cultural Capital	.405	.000

According to the results shown in table 6 the variables of educational, organizational, motivational factors and cultural capital delineate 33% of the changes of scientific activism.

Table 5. Statistics of multiple regression model and the summary of the model

The source of effect changes	The sum of squares	The mean of squares	Level of freedom	The quantity of f	Level of significance
The effect of regression	3335.134	833.784	4	34.526	000.
Remainders	6713.565	24.150	278		
Total	11754.788		329		

Table 6. Multivariate regression analysis of variance on scientific activism

Multiple correlation coefficient	.576
The coefficient of determination	.332
Revised The coefficient of determination	.322
Standard error	4.914

8. **Discussion and Conclusion:**

The results show that there is a direct and significant relationship between social and environmental factors, such as organizational and educational factors, and individual factors, such as motivation and cultural capital, on one hand and scientific activism on the other hand. The findings of this study is in line with the previous studies, especially those of Feli et al. (2006)in which access to research facilities (organizational factors) show a significant and positive relationship.

The findings of this study are also in line with Javaherzade's study (2008) which showed that there is a direct and significant relationship between instructor's seriousness in directing student's research and paying attention to research in university through suitable advertisement and student research festival (educational and organizational factors), and also the findings are in line with Zarifian and Mohammadi's study (2010) which showed that there is a positive and significant correlation between students' tendency toward research with their usage of databases, access to proper facilities for research (organizational factor) and instructors' attitude toward research (educational factors).The findings of this study unlike Jone's et al (2000) and Cracker (2006) showed no significant difference in scientific activism in terms of gender.

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