Factors Influencing Research Activities of Postgraduate Students in the University of Mazandaran, Iran

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ABSTRACT

Postgraduate student's academic activities have an important role in the production and development of scientific knowledge. The present study was mainly aimed at identifying factors which might affect postgraduate students' scientific and research activities at Mazandaran University. The survey method was used and the data were collected through questionnaire. The sample population was selected through stratified sampling method and consisted of 278 postgraduate students doing their masters and PhD study. The findings of the study showed that there was not a significant difference between the scientific activities of doctoral and master students in terms of gender, marital status and locality. Beta coefficients indicated that the academic activities of the students were affected most by the university facilities (β=0.36) and students' satisfaction with the teachers (β=0.34) and the least (β=0.17) by students' interaction with professors. Additionally, it can be argued based on MIMIC Model that the students' concerns, as a variable, had a negative impact on their scientific and research activities. The Adjusted R Square indicated that 38% of the scientific and research activities (the dependent variable) were explained by the independent variables studied in the model.

Keywords: *research activities, student-teacher interactions, satisfaction with teachers, postgraduate studies, higher education*

INTRODUCTION

Today there is no doubt that research and scientific production are the criterion for the superiority of nations and societies. Universities play a key role in national development and advancement of knowledge, science and technology and are the mainstay of thought and research in any society. The growth of graduate education has been one of the most important strengths of higher education in the past two decades, which has witnessed a remarkable development with regard to its double importance of research-based education than other programs. Postgraduate students go through a lot of research-based education during their studies and they need to present a thesis for their degree. Hence, they are deeply involved in research and play a wider and more important role in the production of science and knowledge (Faely et al, 2007). It would be impossible to develop students' creative talents in science production and participation in the development of the country without involving students with research in their daily lives and activities (Entwistle, 2002). Although specific and accurate statistics on the contribution of postgraduate students to the production of research activities are not clear, few conducted studies have shown that graduate students have a large share in scientific production. For example, Refahi et al. (2000) found that 55% of medical research was based on graduate and postgraduate dissertations. Therefore, attention to research activities of this scientific community of the country can lead to scientific progress of the country in various fields of science. Understanding the needs and concerns of these students, providing material and spiritual support, creating a suitable framework, providing tools and other research facilities are among the measures that can provide the ground for the development of graduate students' talents (Behzadi, 2013). Production of science and participation in the comprehensive scientific development of the country will be impossible without the research activities of graduate students.

History of science has shown that with the transition from the age of science to the age of great science, science has become a social activity as well as a social institution. Therefore, the research activities of PhD. and masters' students do not occur in a social vacuum and they naturally have mutual interaction with many areas such as environmental factors, eqiupments, satisfaction with professors, university role, areas of student concern and academic interactions of professors with students. Considering

explaining the factors affecting the inclination of accounting graduate students, Salehfar et al. (2014) showed that lack of research facilities at universities and students' dissatisfaction with the facilities were at the top of identified barriers. Additionally, Watty et al. (2008) indicated that research performance has a positive relationship with teaching satisfaction.

Previous research findings have emphasized various factors including postgraduate students' understanding about research, the quantity and quality of student interaction with college, job responsibilities and other students' characteristics on college self-efficacy of postgraduate students (Ghazi Tabatabai & Mrjaei, 2001), (Hemmings & Kay, 2010), research experiences of postgraduate students of Shahid Beheshti University, dissertation supervising manner by the supervisor, developing research skills of postgraduate students, the general atmosphere of the faculty (Yamani Douzi Sorkhabi & Amin Mozafari, 2009; Kardash,, 2000; Abdelhafez, 2007; Marsh et al., 2003), individual-motivational factors (Diaz, 2003), manner of providing research services (Fazlollahi, 2012), and the necessary infrastructure for research (Kaffashi, 2009). The literature review suggests that this topic has been studied in the field of psychology and education while less noted in sociological studies particularly in Iran. In addition, Mazandaran University, as one of the largest universities in the north, plays an important role in providing higher education for postgraduate students and requires to recognize the important effective factors in the field of education and research to promote its main responsibility in this aspect. To date, there is still no scientific research in this area. In this regard, the study of factors affecting research activities of graduate students is essential. Therefore, this study aimed to answer this fundamental question. What factors affect the research activities of postgraduate students of Mazandaran University? However, for readers not familiar with the Iranian higher education system, a brief overview seems warranted.

Higher Education in Iran

Universities in Iran are opened to all eligible Iranians and non-Iranian applicants. The admission of Iranian applicants is done through a centralized state exam, which is administered by the National Organization for Assessment of Education. The higher education system in Iran generally includes educational degrees as follows:

- Bachelor Program (4 years)- The program is mainly coursework based and includes about 135 unit credits

- Masters' Program (2 years)- The program is thesis and coursework based. The coursework includes 28 unit credits and thesis is equivalent to 6 unit credits

- PhD Program (4 years) - The program is thesis and coursework based. The coursework includes 18 unit credits and thesis is equivalent to 18 unit credits.

Academic year in Iranian universities start from September and lasts until June and is divided into two semesters. Generally, Iran has a large network of private, public, and state universities offering degrees in higher education. State-run universities of Iran are under the direct supervision of Iran's Ministry of Science, Research and Technology (for non-medical universities) and Ministry of Health, Treatment and Medical Education (for medical schools). Some universities receive tuition fees while others are free.

LITERATURE REVIEW

The functionalism approach highlighted the correlation of elements with each other and the integrity of the whole with components require the survival of the whole, the efficiency of components, and the participation of each element in the survival of the system construction, as if it were constructed as a machine or mechanical device with the emergence of functionalism insight. It is claimed that societies are interconnected systems that include a very diverse social structure that contributes to the overall preservation of the system in mutual interactions. On the other hands, Parsons, a constructivist theorist of functionalism, points out in his systemic attitude to the influence of sub-systems on methods and objectives and views the social system consisting of four subsystems: 1. A system or subculture system that combines ideas and thoughts, and beliefs. 2. Social system. 3. Personality system. 4. Environmental system. If all sub-systems enjoy equilibrium, the social system can function properly and the system's equilibrium requires four major conditions: 1. Relationships between these four subsystems in mutual interaction; 2. Input and output rates; 3. Input

and output proportionality; 4. When the three above conditions reach the desired level. A state of equilibrium is put forward in the interrelationship between the systems. According to Parsons, each sub-system or system performs specific functions in the community (Parsons, 1951).

Accordingly, if we consider student research activities as a subsystem, this subsystem is routinely associated with other subsystems in the university and the general system of the society. The positive or negative functioning of this subsystem depends on the coherence and disproportionality of the subsystems and the lack of fitness of other subsystems of the community. It requires the function of other elements and their impact in relation to other elements and the whole system (Abdollahi, 1993). The result of this discussion is that research activities are formed within the two major cultural and natural systems and grow in the process of work in interaction with other sub-systems and the overall system of research activities.

In the functionalism approach, especially structural functionalism, Merton argued that social construction is united with the institution of science in various ways by providing a functional analysis of the dependence of science on social structure (Merton, 1973). This alliance of two independent worlds results in scientific progress and prevents the free and independent development of a science (Ghanei-rad, 2005, p. 35). Based on this approach, more recent thinkers are more concerned with the contribution of social construction to the advancement of science. McGinn points to the progress of science after dividing the factors influencing science into micro and macro contexts into major underlying sub-systems (including cultural, economic, political, and environmental subsystems) (McGinn, 1991, p. 53). In his view, the cultural sub-system consists of beliefs, ideas, ideals, values, motives, states, orientations and trends, notions of meaning, personality norms, patterns and behaviors, tastes, tastes, styles, dreams, cravings and imaginations. Most of these elements are the major areas of scientific development that Robert McGinn calls them the immediate factors of science and technology. For example, if the motive for outstanding achievement work is dominant in society rather than the motive for obtaining material welfare with the slightest struggle and the shortest legitimate or unlawful means, then the people of this class will provide a more favorable ground for creative and successful scientific progress at the university. However, if the motive is not dominant, the market for unhealthy competition will

flourish and the scientific work will stay out of customers and mighty ones (McGinn, 1991:55).

The social (economic and political) sub-system includes components such as structures, forms and patterns of system group relations (groups, circles, classes) in economic relations, roles and centers, institutions, organizations, hierarchies, power relations and control methods. For example, the political structure and its priorities, and the amount of socio-political support, freedom of action and financial support that university professors and university students receive for research activities affect their success rate and the effectiveness of their activities.

Considering the environmental sub-system (Physical-Material), McGinn believes that research activities and scientific growth do not occur in a social and physical vacuum. The environmental context is also in interaction with scientific activities, as proposed in other areas. In brief, the environmental subsystem, building eqiupments, facilities, construction, processing, and techniques all contribute to scientific development (Razeghi, 1996, p. 48). According to McGinn (1991), the backgrounds of the cultural and environmental system are combined and lead to a general cultural environment.

This cultural-environmental combination includes social, intellectual, personality, behavioral and material sub-systems is having a counter-action with the sub-systems and the general system. The result shows that research activities are developed within sub-systems and the two major cultural and natural systems, and they grow in the interactive process of work of sub-systems with each other and with the overall system of research activities. We will face a reduction in research activities in case of imbalances in these sub-systems (ibid., p. 50). Based on this theoretical approach, structural factors and various subsystems including cultural, economic, political, and environmental subsystems can play an important role in the research activities of university graduate students.

In Collins's view, interaction rituals are the elements that play an essential role in the production of science and technology. Interactive rituals are interactions that limit individuals in a moral community and creates symbols through which members view their world through them. Individuals

attending an interactive event are filled with emotional energy based on the intensity of interaction, and they find passion for moving towards symbolic goals. The level of formal and informal interactions and communication and the participation and membership in scientific centers and continuous relations inside and outside scientific centers increase the interaction level between individuals and enhances their emotional energy. In fact, the common attention space among individuals increases their collective sense belonging. When students are influenced by the emotional energy of their teachers, the teaching changes from an instrumental relationship between the teacher and the students to an ethical relationship which is not bound to the class context.

Collins (2009) believes that scientific success is dependent on continuous personal contacts because scientists can exchange their implicit knowledge during direct interaction. For Collins, face-to-face interaction structures have been the source of emotional energy throughout human life, and the field of science are effective (Collins, 2009). The personal relationship between prominent professors and students creates a chain of interactions throughout generations. Therefore, the path of scientific action depends on where individuals are in the social structure of science (interaction network). Hence, it can be argued that scientific interactions between professors and postgraduate students are considered as an important source in the research activities of postgraduate students.

RESEARCH HYPOTHESES

1. There is a no significant relationship between the degree of teachers' satisfaction and the degree of postgraduate students' research activity.

2. The interaction level of professors with graduate students has a significant effect on the degree of postgraduate students' research activity.

3. Students' concern has a significant effect on the degree of postgraduate students' research activity.

4. University environment and facilities have a significant effect on the degree of postgraduate students' research activity.

METHOD

This was a survey study emphasizing on collecting data through questionnaire. The population of the study included M.A. and PhD. students at Mazandaran University. According to the information obtained from Mazandaran University. There were 1239 M.A. and PhD. students studying at Mazandaran University at the time of this research.

Table 1: The Population of M.A. and PhD. Students at Mazandaran University

Faculty	N (M.A. students)	N (PhD. students)
Humanities	303	6
Basic Sciences, Mathematics & Chemistry	414	123
Physical Education	85	0
Economical science	269	22
Law and Political Science	168	6
Engineering & Art & Architecture	0	0
Total	1239	157

To determine the sample size, a total of 278 students were selected through Cochran formula. The study used a stratified sampling method based on the sample nature. Based on stratified sampling method, first the university was divided into different faculties (mathematical sciences, humanities, economic and administrative sciences, basic sciences, engineering, physical education, theology, chemistry, law and political science and art), and the different degree programs (master's and doctoral degrees). Then, by specifying the share of students in each faculty and taking into the account of the educational level (master's and doctoral degrees), the research samples were selected systematically from each faculty.

Measuring Variables:

Dependent variable: Research activity

In this research, the concept of research activity of postgraduate students was measured in three dimensions of activity in the scientific community, publishing activity and the extent of mastery of research skills.

- Activities in the scientific community included attending a conference, seminar, association and writing workshops

- Publishing activity included publication of articles, the number of articles published in national and international journals, the number of reviews, summaries and the translation of books in scientific journals, involvement of professors' assistants in the publication of scientific articles

Measuring Independent Variables:

Satisfaction of the professors:

Satisfaction level was measured through items of course presentation, important subjects, new topics and concepts, up-to-date and relevant resources in teaching, timely attendance in the classroom, the degree of flexibility and observance of ethical values, the presentation of the assignments, the regular scientific evaluation of the students, and respond rate to student questions.

Academic interactions of professors and students:

Academic interactions were measured through items such as the number of academic and non-academic counseling, the degree of scientific-research collaboration, the intellectual and scientific effectiveness of professors on students, student's encouragement to group work, promoting creativity among students, giving hope about a major's future ground by faculty members, and professors' awareness of students' status.

University environment and facilities:

It included proper use of educational equipment and facilities for scientific exploration, the employment of experienced professors, appropriate cyberspace, the provision of scientific services, material and moral support, association and scientific organizations by relevant authorities, holding scientific and specialized conferences, and supporting and noticing academic elites.

Student concerns:

It included students' concerns about future job issues, personal goals, financial issues and social pressures, gaining social status, and usefulness for the country's future.

Measuring Reliability:

The Cronbach's Alpha of the research variables are presented in the table below.

Table 2: Cronbach's Alpha of the Research Variables

Variable	Number of Items	Cronbach's Alpha
Research activity	18	0.71
Student Satisfaction with Professors	10	0.86
Scientific interactions of students and professors	9	0.80
academic environment and facilities	10	0.85
Student concerns	5	0.81

The calculated Cronbach's alpha coefficient for measuring variables of the research indicated that the high reliability of the developed instrument for our research variables.

RESULTS

Description of respondents according to demographic variables:

In this research, a total of 131 (49.2%) of students were males and 135 (50.8%) were females. The majority of students were singles (214 subjects, 80.5%) and 52 (19.5%) were married. The age of participants ranged from 21-37, with a mean age of 26 years old. Regarding the educational level, 221 were having masters (83.1%) and 45 were doctoral (16.9%) degree.

Table 3 shows humanities and basic sciences had the highest frequencies of 38.8% and 34.6%, respectively, and theology had the lowest frequency of 1.5%.

Table 3: Frequency Distribution of Respondents According to Field of Study

Field of study	Frequency	Percentage
Humanities	90	38.8
Basic Sciences	92	34.6
Law and Political Science	11	4.1
Economics	51	19.2
Physical Education	18	6.8
Theology	4	1.5
Total	266	100

The data in general indicates that the level of research activity of postgraduate students is lower than the average. To understand the difference between the field of study and the degree of students' research activity, ANOVA analysis was used to identify any difference based on the distribution of the field of study.

Table 4: Frequency Distribution of Research Activities

Activity level	Very low	Low	High	Very high	Mean (5 scores)
Specialized forums of the field	33.8	51.1	12.8	2.3	1.83
Scientific seminars and conferences	10.9	59	26.7	3.4	2.22
Workshops of paper writing	59	37.2	3	8	1.45
Book review sessions	57.1	38.3	3.4	1.1	1.48
Scientific lectures among college students and professors	24.1	48.5	23.3	4.1	2.07

Table 5: Analysis of research activities based on field of study

Variable	Mean squares		df	F statistics	Sig.
Field of study	Between groups	237.262	6	2.387	0.039
	In-groups	225.3723	259		
	Total	486.3960	265		

Table 6 shows that there was a significant difference between the mean research activities of the Law and Political Science Department and other fields.

Another research hypothesis was that there was a significant difference between the degree of research activity between master and PhD. students.

Table 6: Analysis of Variables of Research Activities Based on Field of Study

Field of study	Frequency	Research activity mean	F	Sig.
Humanities	90	12.66	2.387	0.039
Basic Sciences	92	13.80		
Law and Political Science	11	15.05		
Economics	51	14.11		
Physical Education	18	11.7		
Theology	4	14.80		
Total	266	13.39		

Furthermore, the results of the T-test of two independent samples in the table 7 shows a significant difference between the PhD and master students in terms of research activity. Based on the mean, it can be argued that the research activities of the PhD. students are higher than the masters students. However, as table data shows, there was no significant difference between the average research activities of PhD. and Master's students in terms of gender ($p>0.05$), marital status ($p>0.05$) and residence status ($p>0.05$).

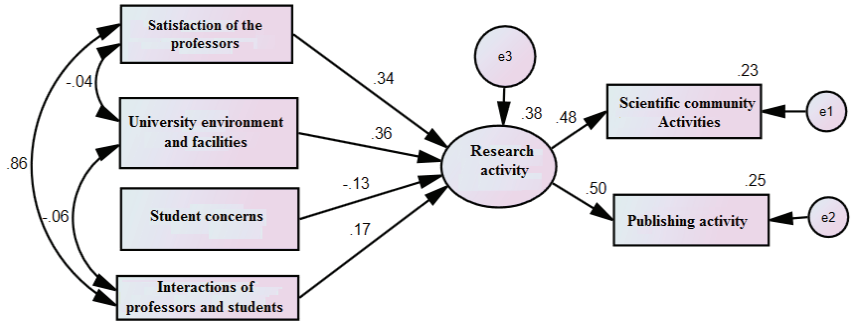
Table 7: T-test Results of Two Independent Samples of Research Activity Based on Variables of Academic Level, Gender, Marital Status and Residence Status

Variable	Groups	N	Mean	Levene's test		Independent T-test		
				F	Sig.	T-value	df	Sig.
Academic Level	Masters	221	12.87	1.54	0.214	5.123	264	0.000
	PhD.	45	15.96					
Gender	Female	128	13.4	0.694	0.406	0.176	261	0.861
	Male	135	13.32					
Marital status	Married	52	13.8	0.992	0.320	0.867	264	0.392
	Single	214	13.29					
Residence status	Resident	107	13.4	0.053	0.818	0.141	254	0.888
	Non-resident	149	13.33					

Multiple Indicators and Multiple Causes (MIMIC) Model Test:

As shown in the model below, four independent variables of student satisfaction from professors, students' interactions with professors, students' concerns, academic environment and facilities have directly affected research activity of postgraduate students.

Empirical Model: Relations between Independent and Dependent Variables (The Degree of Amount of Research Activities of Postgraduate Students)



R^2=0/38 RMSEA=0.06 DF=13 x^2=25/28 sig=0.06

The beta coefficients in the model show that both the environment and academic facilities (β= 0.36) and students' satisfaction from professors (β= 0.34) had the greatest impact while students' interaction with professors (β= 0.17) had the lowest impact. Also, based on the model, it can be argued that the students' concerns (β= -0.13) had a negative effect on the level of research activities of postgraduate students.

Based on the model, the coefficient of determination indicates that 0.38 percent of research activities is explained by the independent variables in the model. Fit statistics in the structural equation represents the fitting of the empirical model because the value of (RMSEA = 0.06) represents an acceptable fit for the structural model.

DISCUSSION AND CONCLUSION

Graduate students play a key role in national development and advancement of knowledge. Hence, science and technology are the main factors of thought and research in any society. Therefore, the research activities of PhD. and masters students are crucial, and scientific development of the country will be impossible without the research activities of graduate students. The findings of the study indicate that postgraduate students do not have a high level of research activities. The findings of the present study on the level of research activities of postgraduate students indicate that the level of research activities of respondents was lower than average. Nearly 70% of them attended seminars and scientific conferences ("little" and "very little"). This issue has to be investigated since postgraduate students have an important role in research products.

Research findings have shown that there is a significant difference between PhD and master students in terms of research activity. This may due to PhD. students are more likely to have more research abilities than master students due to the amount of education received and the higher research experience.

The results of the study showed that there was no significant difference between the average research activities of PhD. and Masters students in terms of gender, marital status and residence status. The insignificant role of

gender in research activities was not consistent with findings of Diaz (2003) who identified gender as a significant factor in academic achievement. However, the results were in line with the study of Yamani and Amin who found that students' research experiences did not differ significantly from one to another in terms of gender and academic degree (Masters and PhD.). One important finding of the study indicated that academic environment and facilities and research facilities such as computer site, library, etc. played a significant role in the research activities of graduate students. This finding is consistent with the results of Salehfar et al. (2014) who cited lack of research facilities at universities as barriers to the research activities of accounting postgraduate students. In addition, according to Mcginn's theory, the environmental sub-system (physical-material), environmental factors, buildings, and equipment do play an important role in the growth of research activities.

The results of the findings indicated that students' satisfaction with professors ($R^2 = 0.34$) had a significant effect on postgraduate students' level of research activities. This finding is congruent with the results of Watty et al. (2008) in Australia, England and New Zealand who stated that research performance of the students had a significant relationship with students' satisfaction with teachers' teaching.

Another important finding of the research was that student-teacher interactions ($R^2 = 0.17$) had a positive effect on postgraduate students' level of research activities. As noted by Collins in his study, research achievement depends on ongoing interaction between the teacher and the student. For Collins, student-teacher face-to-face interactions are a source of emotional energy and are very effective for the growth of research activities. The personal relationship between prominent professors and students who are later highlighted is a chain builder of interactions throughout generations. Therefore, postgraduate students' level of research activities depends on where he or she is located in the social structure of science, that is, their interaction network. An instrumental relationship in scientific interactions does not contribute to the growth of research activities. In fact, the network of interaction, personal communication and interaction between professors and students will contribute to the development of graduate research activities.

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