



RESEARCH SELF-EFFICACY, INTEREST IN RESEARCH AND RESEARCH TRAINING ENVIRONMENT: A CORRELATION STUDY AT DOCTORAL LEVEL

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ABSTRACT- The objective of this study was to find out the relationship of research self-efficacy with research training environment and interest in research. It also found the impact of demographic variables on research self-efficacy, interest in research and perceptions of research training environment. Two research questions and null hypotheses were developed for study. The participants of this study were 121 students of PhD at the departments of education at 11 public sector universities of Pakistan in their first, second and third year of the study. Four data collection instruments were used. A correlational design was used for this research to study the variables. Purposive sampling was used for this design. Pearson correlation and ANOVA was used to test the hypotheses. No significant effect was found among all variables except one; that is age of the respondents. Age has statistically significant effect on the perceptions of research training environment. There was no significant relationship between all the variables except interest in research and self-efficacy of the doctoral students.

Keywords: self-efficacy, interest in research, research training environment, doctoral students

I. INTRODUCTION

The concept of self-efficacy has a theoretical foundation of social cognitive theory which was developed by Albert Bandura, a former president of APA. Self-efficacy is a belief of a person towards his capabilities as Bandura explained it the belief in capabilities to perform a specific action for an outcome. According to this definition of Bandura, self-efficacy can play a major role to demonstrate a behavior. This concept of self-efficacy is related to the social learning theory of Bandura that explains it as a belief to perform a specific act. In other words if a person thinks that he is incompetent to fulfill a particular task, he may not try to demonstrate it. (Bandura, 1977). If a person thinks that he has a high degree of self-efficacy in a specific field. He can overcome the hurdles to approach many difficult tasks. Therefore, self-efficacy is a belief of a person towards the path of success (Tang, Addison, LaSure-Bryant, Norman, O'Connell, & Stewart-Sicking, 2004). In field of research, a person having good degree of efficacy may fulfill obstacles during conducting research. Researchers having high belief of self-efficacy can perform better than the persons with low efficacy in research.

Research is a complex activity with diverse elements. It is not only confined to publish research work in refereed journals which gains prestige among academics (Ramsey, Cavallaro, Kiselica, and Zila, 2002). It also includes developing proposals for research grants, presenting research papers in conferences and workshops, writing books and conducting need assessments. Therefore research processes are multidimensional, comprising elements of not only discovery but integration and applications also (Erwin, 2001; McGrail, Rickard, & Jones, 2006; Shulman, Golden, Bueschel, & Garabedian, 2006). In educational institutions, academic are urged to write for refereed journals and their promotions and increments are often based on their scholarly publications. Motivation for writing research papers and dissemination of knowledge in reputed journals always remain significant (McGrail et al. & Jones, 2006, p. 19) McGrail, Rickard and Jones (2006) described that research publications are considered criteria for judging the performance in universities and gaining research funding from external bodies (Glatthorn, 2002). Also publications in refereed journals increase image and credibility of the institution and researchers' academic positions are maintained within the academic hierarchy. Wilson

(2001) favoured that hiring process in universities especially look forward for those candidates who publish their scholarly work during their doctoral period. This is the inner belief of a person that urges to work more or with enthusiastically. Therefore the construct of self-efficacy is receiving attention in research. Because it also predict researchers' interest in conducting research (kahn,2001).

The accurate assessment of self-efficacy, according to Forester et al, 2004, is also necessary to identify strengths and weaknesses that facilitate research training of researchers and interfere their guidance and willingness to conduct research. Many research studies have been conducted to examine its relationship with other variables. The relationship between self-efficacy, research productivity and research training environment was examined by Phillips and Russell in 1994. This study was conducted within the graduates of counseling centers working in different universities. These 125 graduates were employed there. The research training environment scale and the research self-efficacy measure developed by Phillips & Russell, 1994 was used. The results of this study indicated a positive relationship between research training environment and research self-efficacy.

Another study was conducted by Hollingsworth and Fassinger (2002). In which the role of faculty mentoring in research training of the scholars of counseling psychology who were enrolled in 25 APA accredited programs. Results of this study indicated that there was a positive correlation between research training environment and students' research mentoring experiences. Research self-efficacy was also correlated with students' interest in research by Bieschke (2006). This study determined that there was a significant positive correlation between the two variables.

There are other similar studies which found the relationship among different variables e.g research training environment, research attitude, research interest and research productivity of the doctoral scholars. A survey was conducted on 348 doctoral students to find out their interest in research, furthermore, its impact on research training environment was also studied. Positive change was found between research interest and research training environment. Findings of another study indicated the effects of research attitude of students on their research productivity and self efficacy (Bard, Biescke, Herbert, & Eberz, 2000; Kahn & Miller, 2000). Effective research training environment works for the increase of self-efficacy of students. Personal inputs such as investigative interest, age, gender and social interest; environmental inputs and self-efficacy generate interest in research. Amongst all, personal interest affects the interest of graduates in research directly or indirectly.

The literature on self-efficacy, research interest, productivity of research and similar variables indicate the value of self-efficacy in research. Self-efficacy plays a vital role in predicting interest of graduates in conducting research. In research institutes, learning teaching skills, gaining theoretical knowledge relevant to methodology and statistics and most importantly gaining practical knowledge of research design and methodology are important goals for doctoral students. Both theoretical and practical training of research methodology is provided to graduates in other countries. In Pakistan, there is no systematic system of research training for the graduates but theoretical and practical training is provided to the researchers by offering advanced courses in research methodology. Supervisors also involve the researchers in rigorous training while conducting research study. Current study is also relevant to find out the effects of that training environment and interest of the graduates on their research self-efficacy.

OBJECTIVES OF THE STUDY

The objective of this study was to find out the relationship of research self-efficacy with research training environment and interest of the graduates in research. It also found the impact of demographic variables on research self-efficacy, interest in research and perceptions of research training environment. This study may also help the universities to tailor policies to provide good research environment and to foster research interest among researchers.

RESEARCH QUESTIONS AND HYPOTHESIS

Two research questions and null hypotheses were developed to find out statistical relationship among variables.

Research Question: 1

Is there any relationship between research self-efficacy, doctoral students' perceptions of research training environment and their interest in research?

Hypothesis:1

There is no statistically significant relationship between three variables; research self-efficacy, research training environment and doctoral students' interest in research.

Research Question: 2

Is there any relationship between research self-efficacy, doctoral students' perceptions of research training environment and their interest in research and demographic variables (gender, age and education level)?

Hypothesis:2

There is no statistically significant relationship between research self-efficacy, doctoral students' perceptions of research training environment and their interest in research in relation with demographic variables (gender, age and education level).

SAMPLE AND DATA COLLECTION

The participants of this study were the students of PhD at the departments of education at 11 public sector universities of Pakistan in their first year, second year and third year of the study. The researcher could contact 121 doctoral students to participate in this study. The researcher contacted personally to the scholars but their anonymity was assured while collecting research data. Therefore the response rate was 95%. Four data collection instruments were used as a means to collect data to test the research questions and hypotheses i.e Demographic questionnaire, research self-efficacy scale, research training environment scale and the interest in research scale. Research self-efficacy scale that was first developed by Greeley in 1989 was used with minor changes. This scale was designed to measure the perceived ability of the researchers to perform different research tasks. It measures the degree to which the researchers feel confident to perform research activities. The internal consistency of the tool was 0.85 Chronbach's alpha. Interest in research questionnaire that was first developed by Bishop & Bieschke in 1994 was used to measure the degree of interest of the researchers in research. The internal consistency of the tool was 0.88 Chronbach's alpha. Research training environment scales developed by Geslo in 1996 was used after some modifications. This scale was used to measure the faculty behavior, the level of involvement of the students in research activities. The internal consistency of the tool was 0.87 Chronbach's alpha.

II. RESEARCH DESIGN AND DATA ANALYSIS

A correlational design was used for this research to study the variables in their natural condition without any manipulation. It is also a fact that the purpose of correlational studies is to clarify the phenomena by examining the variables and this design also does not find any causal relationship among variables. Therefore purposive sampling is more suited for this design. Researcher was interested to finding out the relationship among three variables; research self-efficacy, perceptions of research training environment and the interest of the doctoral students in research. Therefore, this research design was appropriate for this study. In this study, research self-efficacy was included as dependent variable, and research training and research interest were treated as independent variables. The demographic variables (age, gender, education level) were identified as outcome variables. Correlation was found by using statistical package for social sciences (SPSS). Pearson correlation was employed to find out relationship among variable of research self-efficacy, research training environment and the interest in research. It was also determined whether the relationship among variables is significantly correlated with each other. ANOVA was also used to find out the significant variations among variables. If the value of the relationship is -1 it means there is a strong negative relationship between the variables. On the other hand if the relationship value is +1 it would show that there is a strong positive relationship between variables (Shavelson & Towne, 2002).

The research used most commonly used scale that is likert type rating scale of research self-efficacy, training environment and the interest in research.

Table.1 shows the results of the reliability of three variables; research self-efficacy, research interest and training environment.

Variable	Cronbach's Alpha	No of Items
Research Self-Efficacy	.853	35
Interest in Research	.885	15
Research Training Environment	.873	5

(N=121)

The table.1 indicated that according to Cronbach's alpha there was a good internal consistency between the items of the tools. The internal consistency of all three tools is greater than the cut-off value that is .70. Therefore it can be said that the questionnaires were reliable to measure the self-efficacy of the researchers.

Table. 2. Description of Independent Variables

Independent Variable	Frequency	Percent
Age		
30-35	80	66
36-40	20	16
41-45	21	17
Gender		
Male	80	66
Female	41	33
Education Level		
First Year	70	57
Second Year	31	25
Third Year or more	20	16

Table.2 indicated the descriptive statistics for independent variables (age, gender, education level) of this study. It indicated the frequency and percentages of each variable used in this study

III. FINDINGS OF THE STUDY

Null Hypothesis-1

There is no significant relationship between research self-efficacy, interest in research and research training environment in doctoral program.

In order to test first hypothesis, Pearson’s correlation coefficient was calculated between each pair of variables; research self-efficacy, interest in research and research training environment.

Table.3 Correlation between research self-efficacy, interest in research and research training environment.

** p<.01 N=121

Variables	1	2	3
Interest in research --		.121	.384
---	.053		
Research self-efficacy			--

Table.3 indicated the correlation between variables. Data showed only one correlation that is significant among two variables i.e between interest in research and research self-efficacy(r=.384,p<.001). the other two correlations were not statistically significant between training environment and interest in research, training environment and self-efficacy at .05 significance level.

Hypothesis-2

There is no statistically significant relationship between research self-efficacy, doctoral students’ perceptions of research training environment and their interest in research in relation with demographic variables (gender, age and education level).

In order to test the hypothesis, ANOVA was applied. The results were presented in tables below.

Table.4 ANOVA findings for education level on research self-efficacy

Variable	SS	df	MS	F	p	η ²
Education level	351.270	1	351.270	2.35	.115	.031
Error	12380.854	84	148.400			

R²= .031 N = 121

Table.4 indicated that education level of the researchers did not have a significant impact on research self-efficacy of the researchers at .05 significant level. F= 2.35 and p= .115 in this data. Therefore there is no significant difference between the students of first year, second year and third year or more and research self-efficacy score. Therefore it can be said that students’ education level has no impact on their research self-efficacy score.

Table.5 ANOVA findings for education level on interest in research

Variable	SS	df	MS	F	p	η ²
Education level	1.631	1	1.619	2.532	.113	.030

Error	52.111	84	.630
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R²= .030 N = 121

Table.5 indicated that education level of the researchers did not have a significant impact on their interest research at .05 significant level. F= 2.532 and p= .113 in this data. Therefore there is no significant difference between the students of first year, second year and third year or more and research interest score. Therefore it can be said that students' education level has no impact on interest in research score.

Table.6 ANOVA findings for education level on perceptions of research training environment

Variable	SS	df	MS	F	p	η ²
Education level	1.531	1	1.720	2.544	.1121	.033
Error	52.143	86	.640			

R²= .033 N = 121

Table.5 indicated that education level of the researchers did not have a significant impact on their perceptions of research training environment at .05 significant level. F= 2.544 and p= .1121 in this data. Therefore there is no significant difference between the students of first year, second year and third year or more and research training environment score. Therefore it can be said that students' education level has no impact on perceptions of research training environment score.

In all above findings, the education level of the researchers has not statistically significant impact on their research self-efficacy, interest in research and perceptions of research training environment. No evidence was seemed against null hypothesis.

Table.7 ANOVA findings for gender and age on research self-efficacy

Variable	SS	df	MS	F	p	η ²
Gender	371.312	1	290.40	2.789	.078	.036
Age	163.599	3	54.533	.79	.390	.732
Error	10324.667	77	130.434			.016

Table.7 indicated that gender of the researchers did not have a significant impact on their self-efficacy at .05 significant level. F= 2.789 and p= .078 in this data. Therefore there is no significant difference between the gender of the students and self-efficacy score. Therefore it can be said that gender of the students has no significant impact on their self-efficacy.

Based on the table above, the age of the students did not have a significant impact on their self-efficacy at .05 significant level. F= .390 and p= .732 in this data. Therefore there is no significant difference between the age of the students and self-efficacy score. Therefore it can be said that age of the students has no significant impact on their self-efficacy.

In above findings, the gender and age of the researchers have not statistically significant impact on their research self-efficacy. No evidence was seemed against null hypothesis.

Table.8 ANOVA findings for gender and age on interest in research

Variable	SS	df	MS	F	p	η ²
Gender	.028	1	.028.037	.741.001		
Age	.532	3	.177	.178	.275	.865
Error	51.57679.695					.015

Table.8 indicated that gender of the researchers did not have a significant impact on their interest in research at .05 significant level. F= .037 and p= .741 in this data. Therefore there is no significant difference between the gender of the students and interest in research score. Therefore it can be said that gender of the students has no significant impact on their interest in research.

Based on the table above, the age of the students did not have a significant impact on their interest in research at .05 significant level. F= .275 and p= .865 in this data. Therefore there is no significant difference between the age of the students and interest in research score. Therefore it can be said that age of the students has no significant impact on their interest in research.

In above findings, the gender and age of the researchers have not statistically significant impact on their interest in research. No evidence was seemed against null hypothesis.

Analysis of variance was also found between gender and age of the students and their perceptions of research training environment.

Table.9 ANOVA findings for gender and age on perceptions of research training environment

Variable	SS	df	MS	F	p	η ²
Gender	.002	1	.002	.014	.892	.001
Age	1.301	3	.434	.391	3.385	.021
Error	8.88177	103	.086			.117

Table.9 indicated that gender of the researchers did not have a significant impact on perceptions of research training environment at .05 significant level. $F= .014$ and $p= .892$ in this data. Therefore there is no significant difference between the gender of the students and perceptions of research training environment score. Therefore it can be said that gender of the students has no significant impact on their perceptions of research training environment. As far as the age of the respondents was concerned, there is a statistically significant difference between the age of the students and perceptions of research training environment score. Therefore it can be said that age of the students has a significant impact on their perceptions of research training environment that is $F=3.385$ and $p=.021$. Only the age of the students was found to be significant statistically in this study.

Results of this study are summarized in the way explaining all the variables and hypotheses. Generally in hypothesis one, only the significant correlation was found among variable; research self-efficacy, interest in research and perceptions of research training environment. Significant correlation was found only between research interests and research self-efficacy in this data. This was bivariate correlation. Regarding the hypothesis two, results of the study indicated that there is no statistically significant difference between the year of the students and the three variables; self-efficacy, research interest and the perceptions of research training environment. These three variables were treated as dependent variables. Statistically significant difference was found only on one demographic variable with perceptions of research training environment that is age of the students where ANOVA indicated that the age of the respondents has significant impact on the perceptions of research training environment

IV. DISCUSSION

The discussion of the findings is as under:

Null hypothesis-1

First null hypothesis indicated that there is significant relationship between research self-efficacy as measured by research self-efficacy scale, the interest in research as measured by interest in research questionnaire and the perceptions of research training environment as measured by research training environment scale in doctoral program students. For testing this hypothesis, Pearson's correlation was used between each pair of variables; research self-efficacy, interest in research and the perceptions of research training environment. Results indicated that there was only one statistically significant correlation between research self-efficacy, perceptions of the research training environment, and interest in research scores for this data. This correlation was between the interest in research score and the research self-efficacy. The researchers who had higher interest in research showed higher level of self-efficacy.

Other researchers found similar findings as West, Kahn and Nauta surveyed 132 graduates in 2007 and found a significant correlation between the interest of the graduates and their self-efficacy score. They also mentioned that the students who had higher level of interest demonstrated higher level of self-efficacy. Love and colleagues (2007) found that early involvement in research and interest in research developed research self-efficacy of the researchers and increased comfort level of the students in performing different research tasks. Gelso (2005) noted that more motivated students showed more competence in performing research tasks. He also indicated that encouragement and fostering students increased their efficacy in conducting research. Many other similar studies indicated these types of findings.

Null Hypothesis-2

Second null hypothesis was about significant difference between the variables. The hypothesis was: there is no statistically significant difference between the mean scores of research self-efficacy, interest in research and research training environment. There were three dependent variables under this hypothesis; research self-efficacy, research interest and research training environment. ANOVA was applied to test this hypothesis. Findings indicated that education level of the respondents have no statistically significant impact on self-efficacy of the researchers at 0.5 significant level. The findings of this study are not consistent with the findings of other studies as; Kahn and Scott (2001) in their study found the effects of early years of the program on setting career goals of researchers, their self-efficacy. It also enhanced their research productivity. The present study also differed in a sense that Kahn and Scott found that the longer is the period of study, the more access to the opportunities were available to the researchers. Therefore, it showed the clear relationship of the duration of study with self-efficacy of the researchers. The difference was also found between present study and the study conducted by Philips and Russell in 2000.

The findings of the former study also indicated the relationship between the years of the program of the researchers with their research self-efficacy. The longer duration indicated more self-efficacy among

researchers as compared to first year or second years of the program. Kushner (2003) found in the study that there is a significant relationship of year of the program with research self-efficacy but he could not find a significant relationship between the year of the program and the interest in research. In his study the longer the year of study, the increase in the boredom of the researchers.

The null hypothesis also indicated that there is no statistically significant difference between research self-efficacy, interest in research and the perceptions of research training environment and the age and gender of the respondents. Research self-efficacy, interest in research and perceptions of research training environment were treated as dependent variables. Demographic variables were age and gender of the researchers. It was found that there is no significant impact of gender on research self-efficacy, interest in research and research training environment. There is also no significant impact of age on research self-efficacy and interest in research. Only the effect of age was found significant on perceptions of research training environment. Findings of current study are consistent with the findings of many other studies. A study by Hollingsworth and Fassinger (2002) indicated that there is no significant relationship between gender and self-efficacy and research productivity of the researchers. Also there is no effect of gender on research self-efficacy of the students at post graduate level. An independent sample t-test was applied by Jones (2006) on the variables of research self-efficacy, research productivity and gender. No significant impact was found between two variables of his study. It shows that gender of the respondents has no statistically significant effect on the above mentioned variables.

Present study was also supported by Kahn (2001), he indicated no significant impact of gender on scholarly activities and interest in research. Phillips and Russell (1994) determined a positive correlation between research productivity; research self-efficacy and research training environment. Other similar findings were indicated by Miller (2006) about self-efficacy, research interest and scholarly activities of doctoral students. He reported limited research productivity of the early year students. Kahn and Scott (2001) and Bieschke and colleagues (1996) found that as scholarly activities of the researchers increases, the research self-efficacy increases. In summary, findings also indicated positive correlation or limited correlation between variables in few studies.

The present study showed no relationship or effect of all the variables except two i.e interest in research and research self-efficacy; age and perceptions of research training environments the interest in research increases, research self-efficacy increased. It means there is a positive correlation between these two variables in the current study. The young researchers showed more interest and efficacy in research as compared to aged ones. It means that age matters to increase or decrease of self-efficacy of the doctoral students.

V. CONCLUSIONS

This study was an effort to contribute originally to the literature of doctoral education field. Three variables were studied as dependent variables; research self-efficacy, interest in research and perceptions of research training environment. No significant effect was found between almost all variables except one variable that is age of the respondents. Age has statistically significant effect on the perceptions of research training environment provided at the departments of education of the sample universities. There was no statistically significant relationship between all the variables except interest in research and self-efficacy of the doctoral students. If the interest in research increased, research self-efficacy increased.

VI. RECOMMENDATIONS

The present study may be replicated over a long period of time except three/four years of the study because research work can be longer than four years or the typical length of the course. More demographic variables could be studied as scholarly activities and research productivities, race, location of the program and the number of research courses taken at doctoral level. This study could also be more rigorous if qualitative perspective is also added. Researcher can get more insight into the problems while using quantitative and qualitative ways of research. Integration of qualitative inquiry could be more valuable for these types of research studies to find out the personal experiences of the respondents. This study can also be extended to the perceptions of faculty of the doctoral education program. This study may also be helpful in curriculum development at doctoral level and also helpful to foster interest in research.

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