FACTORS AFFECTING RESEARCH PRODUCTIVITY IN PRIVATE UNIVERSITIES OF LAHORE: A DISCRIMINANT ANALYSIS

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Abstract

The significance of research to a university cannot be understated as it leads to creation of new knowledge, inventions and innovations. It assists in improving the quality of teaching faculty and the status of an institution in society. Decisions about promotion and tenure heavily rely on the quality and quantity of research output. This paper tries to determine the impact of different factors on research productivity of staff in private universities of Lahore. A self-administered questionnaire has been used to gather data. The sample size comprises of 169 faculty members from five selected universities of Lahore. Data has been analyzed by using statistical techniques of Principal Component Factor and Discriminant Analyses. We conclude that teaching responsibilities and conferences play a significant role in determining research productivity in universities.

Keywords: Research output, research productivity, faculty, private Universities, factor analysis, Discriminant analysis

JEL Classification: Z.000

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Introduction

Research Productivity is the amalgamation of research and productivity. Research is a vigilant study and productivity is an output produced during specific time period. It is an incessant procedure which helps to determine fact or reality. It helps to solve questions, gather relevant information or data, produce results and then on the basis of given results recommendations are given. It assists in making corrections and adding up knowledge. Research-based knowledge or information is reasonable, lucid and experience-based.

Research is a methodical search for information in order to obtain a lucid picture concerning the fundamental question. Technically, research is a procedure of identifying a problem, establishing an objective, gathering and evaluating the pertinent data in order to determine the possible factors determining the problem. Thus, research behavior is a consistent search for information with the objective or purpose to get a clearer view about the problem and to propose precise suggestions for the solution.

Research has been defined by a number of researchers as a systematic method of collecting information to answer questions (Drew, Hardman and Hart, 1996). Best and Kahn (1998) explained it as an objective and systematic analysis and recording of controlled observations that may lead to generalizations, principles or theories, resulting in predictions and possible control of events.

Higher education plays a vital role in an individual’s success and contributes excessively in the economic growth. There is a dire need for the knowledge economy to be global, as should be the reach of universities. Universities are institutions where the hopes and dreams of individuals are nurtured and their minds expand. Innovation and ideas in addition to exchange of students and faculty takes place in these institutions at the international level. Faculty members all over the world collaborate with each other to enhance the existing knowledge base.

Research, for faculty members, has always been stressed world over especially at the university level. Even in Pakistan it has been greatly emphasized in the last decade and a half, especially after
the establishment of the Higher Education Commission*. Promotions and tenures are dependent on the research productivity of faculty members. Allen (1996) found a strong and positive relationship between research productivity and teaching effectiveness of faculty, though Feldman (1987) and Hattie and Marsh (1996) concluded that teaching effectiveness was slightly affected by research productivity. Adams and Griliches (2000) found research productivity to have a constant return to scale at an aggregate level for US universities and everyone benefitted from the research being undertaken.

Thus, this study aims at understanding the determinants of research productivity and the characteristics of researchers that would affect this research productivity in a developing country scenario like Pakistan.

**Literature Review**

Research productivity means publication of research articles or papers in journals. Research publication is considered an essential indicator of showing academic faculty productivity. Research accomplishment is determined by the number of articles produced. Cresswell (1986) identified research productivity as number of research articles published in journals and in proceedings of conferences, inscription a chapter or text, collecting and evaluating unique piece of substantiation, assisting post graduates on their thesis and projects. According to Weiden borner (2007), research process involves three steps i.e. searching, reading and writing. A research undertaken by Perry et al (2000) signified that academic faculty staff took successful research as an important factor that affected evaluation and believed that publications play a significant role for promotions. Kotrlik et al (2002) took publications as substitute for research productivity. They recognized completion of doctoral program in five years, research confidence of faculty members and number of assistant hours allocated to faculty members as factors determining research productivity. US researchers Hadjinicola et al. (2005) defined research productivity as number of articles published by POM (Production & Operation Management) professors in a specific time frame. The factors responsible to improve productivity and quality of research articles were availability of centers for research,

*"A regulatory body for the universities of Pakistan"
external funding sources and library facilities. Further, they observed that Doctoral students are also helpful in improving the research quality and productivity. Several family-related factors were evaluated by Sax, Hagedon, Arredondo and Dicrisci III (2002). They studied the impact of role of marriage, children and ageing parents and concluded that they affect the research productivity.

Universities are considered as modern businessmen, who undertake research to produce knowledge. It is believed that teaching and research are interconnected. Iqbal and Mehmood (2011) focused on research as a part of modern education of university and found that the factors responsible for low research productivity are teaching load, administrative responsibilities along with academic responsibilities, unavailability of funds, absence of research leave, behavior of the faculty towards research, no research skills, unavailability of updated literature, unavailability of journals, very few university owned journals. Alghanim and Alhamali (2011) identified that lack of time, lack of research assistants, lack of research funds, busy with teaching load and involvement in administrative work would bring negative effect on research productivity. Sulo, Tuitoek and Chelangat (2012) tried to determine the relationship between accessibility to research funds, the amount of time allocated to research, the qualifications of the researchers and research output by the staff and recommended that University must improve their staff qualifications, research environment, funding, and time availability and hiring qualified staff to increase the research output in Universities.

According to Lee and Rhoads (2004) faculty members are considered most precious and significant reserve of any university and their promotion of competency and knowledge affect the quality and excellence of university. It is assumed that conducting research brings a negative impact on faculty performance and productivity. Taylor, Fender and Burke (2006) said that conducting teaching activities and providing research by faculty members have a negative relationship with their productivity. Various intrinsic and extrinsic motivators to conduct research were analyzed by Chen, Nixon, Gupta and Hoshowe (2010) and deduced that the accomplishment of rewards of tenure and promotion affected the research productivity strongly. Usang, Basil, Lucy and Udey (2007) added that gender, marital status and areas of specialization affect the research productivity significantly.
The goal of Sabazwari, Kauser and Khawaja (2009) was to observe the behavior of new generation to research and factors related with research productivity. They found that only 41.5% of respondents were conducting research i.e. less than even half of the respondents. Research related training during the period of post-graduation was found to be a highly significant factor that affected research productivity. Personal, contextual and motivational factors were studied by Hardre, Beesley and Miller(2011). The factors found responsible for maximum variation in research productivity were research effort, research value and teaching load. Migiro, Migosi and Ogula (2011) undertook their research in Kenya by using Toutkoushian’s model (2006) that connects research productivity with different economic variables. The results proved that personal and institutional factors with human capital are responsible for low research productivity among faculty members of universities in Kenya.

Patchawong, Wangpan and Ounjit (2012) aimed to study factors that affect research productivity and academic work and revealed that factors for which lecturers need support from university include funding, remuneration, incentives allocation and insufficient research laboratories. Jung (2012) said that past literature is extremely quantitative in nature and divides factors determining research productivity into personal characteristics and institution related features. Then Tafreshi, Ghulam Husseini, Naghi and Gashlash (2013) divided their study in two parts i.e. qualitative and quantitative. Results showed that organizational factors have no direct effects on research productivity of faculty but individual factors do.

Our review of research productivity suggests that there are various factors which are responsible to determine it. These factors include assistance in data gathering and compilation, online access of journals, e-library, funding, compensation, salary increment, promotion, research training, time for research, availability of supervisor and speed of internet, teaching load, technological advancement, self-satisfaction, impact of conferences, new methodologies, attending conferences and peer recognition (Colleague appreciation) etc. Although these factors have high repetition but at the same time the significance of other factors cannot be denied. It has been found out that in few countries like academics in Hong Kong are internationalized as research activities. Their research
Factors Affecting Research Productivity

productivity gets affected by personal characteristics, work load, research styles, and institutional traits. However, there has been low level of research output and less participation in research activities by the faculty members of universities of Pakistan.

In majority of reviewed articles, it has been observed that descriptive statistics (frequencies, percentages, means & standard deviations), regression, correlation and hypothesis testing have been conducted to analyze the collected data. In the current paper advanced statistical techniques including factor and discriminant analysis has been used.

Research Questions

Having established the importance of research productivity for faculty members specifically and in general, this research aims to answer the following questions.

1. Describe the factors (extrinsic and intrinsic) which determine the Research Productivity of the faculty members i.e. the number of articles produced by the faculty members.
2. Distinguish groups on the basis of different factors, demonstrating which factors add mainly to group separation.

Theoretical Framework

Notation and Description of Variables in the Analysis

The following is the list of variables used in the estimation and analysis of the model.

Dependent variable:
Research Productivity

In this study, research productivity has been measured by number of articles written by respondents who have either been published or approved for publication in the last two years. Faculty members indicated the number of articles they have written which have been published or approved for publication. The number of
articles mentioned were then ranked according to 1 to 5 scale, where 1 was assigned to 0-1 articles, 2 was assigned to 2-3 articles, 3 was assigned to 4-5 articles, 4 to 6-7 and 5 to 8 & above articles.

**Independent Variables:**

**R & D Factors**

R & D Factors comprise of research facilities available at the responding universities and opportunities available for career development of the faculty. Facilities involve assistance in data gathering and compilation, online access of journals, e-library facilities, funding availability, availability of supervisor, speed of internet, research training, time for research and research compensation, salary increment and promotion. Respondents indicated if they were satisfied with facilities available for research at their universities by responding to the questions such as “I am satisfied with the online access of journals from my home”, “I am satisfied with internet speed at my university”, “I am satisfied with the electronic library facilities at my university”, “I am satisfied with the availability of the supervisors at my university”, “I am satisfied with the assistance in gathering and compilation of data”, “I am satisfied with the amount of funding available for research in my university”, “I am satisfied with the time available to me for research apart from teaching”, “I am satisfied with the research training given at my university”, “I am satisfied with the compensation amount given for research (Money awarded in case of publication)”, “I am satisfied with the salary increment (Yearly Increase) given” and “I am satisfied with the promotion opportunities in my university” on a 5 point Likert scale where 1 is strongly disagree and 5 is strongly agree.

**Teaching Responsibilities**

Faculty indicated the perception of their teaching responsibilities by responding to the questions such as “I am satisfied with the courses assigned to me”, “I am satisfied with the teaching assistants provided to share my work load” and “I am satisfied that my timetable is according to my preference”. Factor analysis also
supported the relation between them. A 1 to 5 (1 is strongly disagree & 5 is strongly agree) Likert scale was employed to get responses.

**Conferences**

The factor Conferences is a compilation of three items including impact of conferences, new methodologies and attending conferences. The main idea was to observe that if the respondents attending conferences found them helpful in learning new methodologies and producing research. Respondents indicated their perceived satisfaction on a Likert scale of 1 to 5 (1 is strongly disagree, 5 is strongly agree) by answering the following questions “I try to apply new methodologies in my research work”, “I feel that attending conferences really helps in increasing knowledge” and “I am satisfied that the conferences which I have attended in the last 2 years had a positive impact on my research work”.

**Self-Satisfaction**

Self-satisfaction is the composition of two variables i.e. technological advancement and staying updated and current in the respective field of interest. In various articles, it has been observed that learning new technologies make a person updated and current in the field and is a source of self-satisfaction. Faculty members indicated their internal satisfaction by responding to the questions such as “I feel that peer recognition is very important for self-satisfaction” and “I keep myself updated with new technological advancements in my field” on a Likert scale of 1 to 5 (1 is strongly disagree, 5 is strongly agree).

**Peer Recognition**

Peer recognition is taken as colleague appreciation. It is an intrinsic factor as it makes the person internally satisfied and content if his colleagues, peers and students appreciate him for his work and he is given recognition. Faculty indicated their perceived satisfaction of appreciation by their fellow colleagues by responding to “My fellow colleagues always appreciate my work at my university” on a 1 to 5 Likert scale (1 is strongly disagree, 5 is strongly agree). It has been included in the study as a single variable factor as it was found to have a very high loading of 0.82 which could not be ignored.
Factors Affecting Research Productivity

Methodology

Data Source and methodology

There are total 18 private universities operating in Lahore. The population in the study included the faculty of the selected private universities of Lahore ranging from professors to teaching fellows/lecturers. All the variables and scales included in the questionnaire are based on the literature review done. Faculty members from different universities were taken as the unit of analysis.

A pilot study was conducted in one of the universities beforehand to test the validity of the questionnaire. Questionnaires were distributed to 50 faculty members all full-time including males as well as females and responses were collected. Responses and comments from the faculty members were taken into account and the questionnaire was finalized to be floated for the collection of data for this study.

The researcher made questionnaire was designed according to the variables from literature, three items were proposed to measure the variable “Teaching Responsibilities”, eight items for the variable “Research Facilities”, three items for “Career development opportunities”, three items for “Attending Conferences”, two items for “Peer Recognition” and two items for “Self-Satisfaction. Participants were asked to rate the items of each variable according to their own preference. A 5-point Likert scale was used to collect the ratings from the respondents where: 1 is totally disagree, 2 is not agree, 3 is neutral, 4 is agree and 5 is strongly agree. Cronbach’s Alpha is used to testify the reliability of each item (variable) and
construct validity. The Cronbach’s á co-efficient came out to be greater than 0.7 (0.867) ensuring reliability of the variables used in the questionnaire.

The sample of 5 universities was then drawn through random sampling out of 18 private universities operating in Lahore according to HEC. The sample included 350 full-time faculty members, affiliated with five universities. 214 questionnaires were received; only 169 questionnaires were found completed satisfactorily for a response rate of 61%, where 56 were filled by the male teachers and 113 by the female faculty members.

Discriminant analysis has been employed in this paper because of the ordinal”” nature of the dependent variable i.e. number of publications which has been categorized into different groups on the basis of the number of articles written.

The Identification of the Determinants of research productivity

To achieve the second objective i.e. determining the intrinsic and extrinsic factors which determine the number of publications, given the factors identified from literature, Principal Component factor analysis, with varimax rotation”” helps to determine that whether the data could be combined in small number of factors. Factor analysis is a process of combining the information given in a large set of factors into a smaller number of new merged variables, minimizing information loss (Hair et al, 1997). Hair et al, (1997) has suggested that at least 5 observations for each factor would be acceptable to get included in analysis. In this paper, the measure of sampling adequacy (KMO=0.85), considered appropriate.

Therefore, principal component factor is a reliable tool in given situation. The ‘scree’ plot assists in identifying most significant factors from large number of variables. Finally, five factors got selected from twenty variables. All factor loadings greater than 0.5 were taken. After the identification of statistically significant five variables, the

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"When items are classified according to whether they have more or less of a characteristic.

"In statistics, a varimax rotation maximizes the sum of the variances of the squared loadings.

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main goal is to name each variable appropriately. The names and explanation of all five derived variables are given below:

1. The first factor comprises of 11 statistically significant loadings with positive correlation. The satisfaction with ‘assistance in gathering and compilation of data’ shows highest correlation followed by satisfaction with ‘Online Access of Journals’, ‘Electronic Library Facilities’, ‘Funding availability’, ‘Research Compensation’, ‘Salary Increment’, ‘Promotion’, ‘Research Training’, ‘Time available for Research’, ‘Availability of Supervisors’ and ‘Speed of Internet’ of the responding universities. This factor has been named as Research and Development factors as all variables included are related to the research facilities and the career development opportunities.

2. The second factor consists of 3 significant variables, ‘Satisfaction with Courses’, ‘Satisfaction with Timetable’ and ‘Satisfaction with Teaching Assistants’. This factor is termed as Teaching Responsibilities, as all three variables relate to the teaching effectiveness.

3. Both variables, in this factor, strongly focus on the perception that recognition of one’s work by the fellow colleagues is a result of staying updated in the field. This factor includes ‘Peer Recognition for self-satisfaction’ followed by ‘Staying Updated with Technological advancements’. Ultimately, it is termed as Self-Satisfaction.

4. The fourth factor consisted of three variables which are ‘positive impact of conferences on one’s research work’, ‘applying new methodologies in one’s research work’ and ‘increased knowledge as a result of attending conferences’. The factor has been named ‘Attending Conferences’, where all the variables included one way or the other emphasize the importance of conferences on one’s research work.

5. The final factor has only one variable with a very high factor loading of 0.82, the importance of which cannot be ignored so this has been taken as an individual variable and has been termed as ‘Peer Recognition’. This variable relates to
the appreciation of one’s research work by the fellow colleagues.

6. The reliability of these factors is authenticated by ‘Cronbach alpha’ (Hair et al, 1997). It is preferred that alpha (α) value should be greater than 0.70, but scores of 0.60 and above are also considered acceptable according to another study of DeVellis (1991). In this study, ‘Research and Development Factors’ is ideal while others are acceptable.

Results

Descriptive statistics i.e. frequencies and percentages have been used to analyze the faculty demographics i.e. gender, marital status, age, academic rank, area of interest. With regard to the sample faculty members 33.1% were males and 66.9% of the respondents were females. Out of these respondents, 65% were married whereas 35% were single. 14.2% of them work in finance domain, 21.9% in management, 21.3% in economics, and 26% in the area of social science (Insert figure 2 about here); 13 faculty members were Professors (7.7%), 18 were Associate Professors (10.7%), 29 were Assistant Professors(17.2%), and 109 were lectures (64.50%). In terms of grants/funding received, 21.9% of the faculty members responded positively whereas 78.1% negatively.

As far as the number of articles produced that have been published or accepted for publication for the last two years, the percentage of respondents that have rarely published one or no paper is 70.4%, those which published two to three articles is 18.9%, and those which produced four to five articles is 4.7%. The respondents that wrote considerably good number of articles i.e. six to seven are 1.8% whereas those which produced 8 & above articles (which is considered exceptionally good) is only 4.1%.

Considering the hours spent on teaching relative to time spent on research, looking at the minimum and maximum values it is seen that 27.2% faculty members spent less than five hours a week on research whereas 2.4% spent between 36-40 hours. In case of teaching hours in a week 6.5% of members spent 36-40 hours and 36.1% of members spent 11-15 hours on teaching.
Factors Affecting Research Productivity

Findings and Discussion

Klecka (1980) defined discriminant analysis as a statistical tool that is used for classification of observations. To answer the basic objective of the study as to which are important discriminators or the determinants of research productivity and to which category of publication count, the faculty members belong to, Discriminant analysis has been used. Moreover, the dependent variable is ordinal (categorical) whereas all independent variables are interval. Sample selected for validity included 118(70%) faculty members, whereas 51(30%) respondents were taken as the holdout sample.

Discriminant analysis generates functions that classify the groups. For this study, the groups made in this analysis were created according to the number of articles the respondents had produced i.e. 0-1, 2-3, 4-5, 6-7 and 8 &above articles that had been published or approved for publication in the last two years. After running discriminant analysis, four functions were produced as we had a total of 5 groups where the first function maximizes the difference among the group highly with respect to independent variables. The first function was the only significant function included.

The canonical correlation shows interdependence between the predictors and the identified discriminant function. A canonical correlation of 0.42 has been observed in this paper and function 1 account for 71.4% of the variance and the significance of Wilk’s Lambda explains that function 1 is statistically significant, so it helps to distinguish between five identified groups.

Table of test of equality of group means (table 1) gives statistical evidence (strong) of significant differences among means of all five groups for these two independent variables.

Group Statistics (table 2) examined the possibility of any significant differences between groups for all independent variables on the basis of group means. This table suggests that these may be discriminators as separations are there. For example, mean differences between Teaching Responsibilities and Conferences.
The pooled within-group Matrices table (table 3) showed low inter-correlations between independent variables. There exists a zero correlation between R & D factors and conferences, showing that there is no interdependence between these two variables.
Table 3:
Pooled Within group

<table>
<thead>
<tr>
<th>Correlation</th>
<th>R &amp; D Factors</th>
<th>Teaching Responsibilities</th>
<th>Staying Updated</th>
<th>Conferences</th>
<th>Peer Recognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>R &amp; D Factors</td>
<td>1.000</td>
<td>.013</td>
<td>-.113</td>
<td>.000</td>
<td>-.063</td>
</tr>
<tr>
<td>Teaching</td>
<td>.013</td>
<td>1.000</td>
<td>-.025</td>
<td>-.067</td>
<td>-.024</td>
</tr>
<tr>
<td>Staying Updated</td>
<td>-.113</td>
<td>-.025</td>
<td>1.000</td>
<td>.031</td>
<td>.015</td>
</tr>
<tr>
<td>Conferences</td>
<td>.000</td>
<td>-.067</td>
<td>.031</td>
<td>1.000</td>
<td>.066</td>
</tr>
<tr>
<td>Peer Recognition</td>
<td>-.063</td>
<td>-.024</td>
<td>.015</td>
<td>.066</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The Discriminant coefficients (weights) indicate an index of the contribution made by each predictor as betas (standardized regression coefficients) in regression equation (table 4). The direction of relationship is observed from signs attached with coefficients i.e. direct or inverse. It is said that teaching responsibilities is the strongest predictor while conferences are next in importance followed by R & D factors, self-satisfaction and peer recognition. Variables with large coefficients stand out because they predict allocation to the five identified categories of number of articles written strongly.

Table 4:
Standardized Canonical Discriminant Function Coefficients

<table>
<thead>
<tr>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>R &amp; D Factors</td>
</tr>
<tr>
<td>Teaching Responsibilities</td>
</tr>
<tr>
<td>Staying Updated</td>
</tr>
<tr>
<td>Conferences</td>
</tr>
<tr>
<td>Peer Recognition</td>
</tr>
</tbody>
</table>

Structure Matrix table shows the Relative importance of predictors (table 5). The structure matrix table highlights the correlation (interdependence) between each identified variable and discriminant function. Over here, teaching responsibilities, self-satisfaction and conferences are considered important as their factor loadings exceed 0.3. The factor loadings of R&D factors and peer recognition are less than 0.3, indicating them to be less important variables.
Table 5:
Structure Matrix

<table>
<thead>
<tr>
<th>Function</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>R &amp; D Factors</td>
<td>.298 *</td>
</tr>
<tr>
<td>Teaching Responsibilities</td>
<td>.463</td>
</tr>
<tr>
<td>Staying Updated</td>
<td>.594</td>
</tr>
<tr>
<td>Conferences</td>
<td>.452</td>
</tr>
<tr>
<td>Peer Recognition</td>
<td>-.262</td>
</tr>
</tbody>
</table>

Table 6:
Canonical Discriminant Function Coefficients

<table>
<thead>
<tr>
<th>Function 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>R &amp; D Factors</td>
</tr>
<tr>
<td>Teaching Responsibilities</td>
</tr>
<tr>
<td>Staying Updated</td>
</tr>
<tr>
<td>Conferences</td>
</tr>
<tr>
<td>Peer Recognition</td>
</tr>
<tr>
<td>(Constant)</td>
</tr>
</tbody>
</table>

The canonical discriminant function coefficients (table 6) are used to create discriminant function which works as a regression equation. According to this, we end up getting the following equation:

\[ D = (.355 \times R&D \text{ Factors}) + (.586 \times teaching \text{ responsibilities}) + (.463 \times self \text{ satisfaction}) + (.497 \times conferences) + (-.252 \times peer \text{ recognition}) + .153 \]

The discriminant function coefficients show the contribution of each variable to the discriminant function partially. They assess unique contribution to the discriminant function made by each independent variable. According to this equation teaching responsibilities and conferences have highest contribution to the discriminant function. To conclude, there is a classification phase. The classification table, also called ‘confusion table’ is simply a table in which rows are the observed classes of the dependent and the columns are the predicted categories. The overall predictive accuracy of the discriminant function is called Hit Ratio. The classification results revealed that 41.5% of respondents are classified correctly into ‘0-1’, ‘2-3’, ‘4-5’, ‘6-7’ or ‘8&above’ groups, which validates our result.
Conclusion

The main aim of this paper is to discover factors that seem responsible for research productivity in terms of number of articles. With the help of statistical technique (Principal Factor Analysis) we ended up finding five factors i.e. R&D Factors, Teaching Responsibilities, self-satisfaction, conferences and peer recognition. Furthermore, Discriminant Analysis showed that Teaching Responsibilities and Conferences (table 6) are the key factors that determine research publications but to some extent, self-satisfaction also seems responsible. However, R&D factors and peer recognition cannot be considered as driving forces behind research publications as remaining factors are.

This paper has identified teaching responsibilities and conferences as the main factors affecting research. Therefore, Universities should encourage faculty to acquire specialized research skills and higher degrees. Graduates should be motivated to convert their theses into publications. Research environment should be improved by allocating more resources including latest library facilities, computers, effective internet, access to journals and funding. More research compensation should be provided to motivate faculty and collaborative research needs to be focused on. Collaborative research is a pool of shared ideas, opinions and increased productivity (Allison et.al, 2008). Ideas which are accomplished through collaboration are far more versatile and valuable compared to results obtained through working independently (Reither et.al, 1989).
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