Determinates of Scientific Productivity of Agricultural Scientists

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ABSTRACT

The present study was conducted in 14 institutions under the control of University of Agricultural Sciences, Dharwad in Karnataka. Most of the teachers (86.57 %), and extension workers (80.95 %) and majority of the researchers (71.43 %) were found to have medium level of job perspective. Majority of the teachers (70.15 %), researchers (59.52 %) and extension workers (66.67 %) were found in the medium level of teaching productivity category. It was noticed that 79.11 per cent of teachers, 71.43 per cent of researchers and 66.67 per cent of extension workers belonged to medium level of research productivity category. Considerable of higher per cent of extension workers (61.90 %), teachers (58.21 %) and researchers (57.14 %) belonged to medium extension productivity category. Most of the researchers (83.33 %), teachers (68.66 %) and extension workers (66.67 %) belonged to medium level of overall scientific productivity category.

Key words: *Extension workers; Teaching productivity; Research productivity; Extension productivity;*

The Agricultural Universities have made significant contributions in the field of agricultural education, research and extension justifying the investment of public fund in them. They are serving as pivotal heads of new knowledge, instruments for increasing agricultural production and transforming the rural life.

The scientists working in the Agricultural Universities perform teaching function by way of managing Undergraduate, Post graduate and Doctoral programmes; research function by way of managing and or looking after research programmes through All India Coordinated Research Projects (AICRPs), National Agricultural Technology Projects (NATPs) extension function by way of managing Extension Education Units (EEUs), Krishi Vigyan Kendras (KVKs), Remandated Krishi Vigyan Kendras (RKVKs), Trainers Training Centres (TTCs) and other several special projects intended to transfer the technologies to farmers' field and train them to adopt the same effectively.

To be more precise, the scientific productivity is the resultant outcome of performance being influenced by personal antecedent variables which cannot be manipulated such as educational background, length of service, higher training; socio psychological factors such as job autonomy, task identity, achievement motivation, job satisfaction, job involvement and personal importance enjoyed by the employee; organisational factors such as organisational climate, organisational stress and organisational commitment. All these believed to have direct or indirect influence on Job perspective of the individual scientist which ultimately influences his / her scientific productivity directly or indirectly through interaction with each other.

Hence, it was felt necessary to determine the scientific productivity of agricultural scientists and to find out the relationship between overall scientific productivity of the scientists and profile characteristics.

METHODOLOGY

The present study was conducted in 14 institutions under the control of University of Agricultural Sciences, Dharwad in Karnataka. The study was undertaken on ex-post-facto research design. Proportionate random sampling technique was applied to select teachers (67), researchers (42) and extension workers (21) who have

put in at least ten years of service as respondents for this study. Total 130 respondents were selected from the selected institutions. The data were collected by using structured, pretested questionnaire through mailed questionnaire technique. The data collected were coded, compiled and analysed using frequencies and percentages.

RESULTS AND DISCUSSION

It can be observed from the Table 1 that 19.40 percent of the teaching, 28.57 per cent of the research and 19.05 per cent of the extension respondents were under high category only, a less number of respondents of teaching (10.45%), research (11.91%) and (extension (14.28%) were under low category. It may be inferred that most of the respondents of all the categories and teaching (70.15%), research (59.52%) and extension (66.67%) followed the medium level of teaching productivity due to the reasons like more student teacher ration, lack of adequate library facilities, non availability of conducive atmosphere for teaching, more workload and more of administrative work too. This derives support from the findings of *Laharia (1978)* who also reported that majority of agricultural scientists (61.00%) belonged to medium teaching productivity category in Harayana Agricultural University in Harayana state.

Whereas, teaching experience, number of years of service, higher educational qualifications, seniority in hierarchy, exposure to various roles may be the reasons for certain categories of teachers, Researchers and extension. Workers belonging to high level of teaching productivity. It was also found that some of the respondents who had low job experience, medium educational qualification, and more research oriented work had resulted in low level of teaching productivity.

Table 1. Distribution of respondents according to their level of teaching productivity

S. No.	Category	Category of respondents					
		Teachers (n=67)		Researchers (n=42)		Ext. workers (n=21)	
		No.	%	No.	%	No.	%
1.	Low	07	10.45	05	11.91	03	14.28
2.	Medium	47	70.15	25	59.52	14	66.67
3.	High	13	19.40	12	28.57	04	19.05
	Total	67	100.00	42	100.00	21	100.00

These derive support from the findings of *Jhansi (1985)*.

The data in Table 2, reveals that majority of the respondents of teachers (79.11%), researchers (71.43%) and extension workers (66.67%) belonged to medium level of research productivity. While, 13.43 per cent of respondents of teachers, 11.90 per cent of researchers and 14.29 per cent of extension workers belonged to high research productivity category only 7.46 per cent of teachers, 16.67 per cent of researchers and 19.04 per cent of extension workers were under low research productivity category.

It was found during survey that majority of the scientists performed trifold functions of research, teaching and extension activities throughout the year. This kind of work load might have prevented them to reach high level productivity in research. Besides, the teachers with more experience got involved in research mainly through post graduate programmes, while researchers through their regular responsibilities and extension workers through IVLP and other similar special activities. This may lead to higher number of respondent under medium level category. This finding derived supports from the findings of *Jhansi (1985)* who reported that most of the scientists of APAU had medium level of research productivity in Andhra Pradesh state of India. Lack of laboratory facilities, lack of budget, lack of freedom to undertake research studies on their own and discontinuance of the work for larger periods due to frequent transfers might be the causal factors for low level of research productivity. From the same table, it may also be noted that 13.43 per cent, 11.90 per cent and 14.29 per cent of respondents of teaching, research, and extension category respectively had higher level of research productivity. This may be

Table 2. Distribution of respondents according to their level of research productivity

S. No.	Category	Category of respondents					
		Teachers (n=67)		Researchers (n=42)		Ext. workers (n=21)	
		No.	%	No.	%	No.	%
1.	Low	05	07.46	07	16.67	04	19.04
2.	Medium	53	79.11	30	71.43	14	66.67
3.	High	09	13.43	05	11.90	03	14.2
	Total	67	100.00	42	100.00	21	100.00

due to reasons like placement in research centers, less frequent transfer, higher educational qualification, more number of training received and their attitude towards research and income. These findings are in accordance with the findings of *Jhansi (1985)*.

The data presented in Table 3 clearly indicates that considerable per cent of the teachers (58.21%), researchers (57.14) and extension workers (61.90%) belonged to medium category of extension productivity. While 28.36 per cent, 38.10 per cent and 19.05 per cent of teacher, researcher and extension respondents belonged to higher extension productivity category. Where as remaining percentage of the respondents belonged to low extension productivity. It was found that most of the respondents belonged to medium level of extension productivity and this may be due to more work load, higher education, attitude towards extension activities, opportunities provide to interact with SMS and farmers which inturn increase their experience and professional competency.

Table 3. Distribution of respondents according to their level of extension productivity

S. No.	Category	Category of respondents					
		Teachers (n=67)		Researchers (n=42)		Ext. workers (n=21)	
		No.	%	No.	%	No.	%
1.	Low	09	13.43	02	04.76	04	19.05
2.	Medium	39	58.21	24	57.14	13	61.90
3.	High	19	28.36	16	38.10	04	19.05
	Total	67	100.00	42	100.00	21	100.00

Some of the respondents had undergone advanced training programmes conducted by ICAR and other research institutes. Besides, they had higher aptitude in extension activity might have resulted in higher extension productivity. This finding is in conformity in the findings of *Jhansi (1985)*. The reasons for low extension productivity might be due to lack of training, lack of experience and poor financial assistance given by the institute. This finding is in accordance with the findings of *Jhansi (1985)*.

Overall scientific productivity: With the aim of finding out the extent to which each of the selected characteristic contributed to the level of overall productivity, correlation analysis was done and the results are presented in Table 4 and detail discussion regarding relationship between independent variables and overall scientific productivity are as under.

Again, in case of extension workers, personal importance enjoyed by him in rural setting will be great satisfied and makes binds do dedicated service. The respect, importance and recognition enjoyed by him make him to work better and contribute for the development of rural communities. The result of the present study supports this fact and is in conformity with the study by *Mathews (1989)*.

The achievement motivation of agricultural scientists was found to have positive and highly significant relationship with their level of scientific productivity. This indicated that higher the achievement motivation of agricultural scientists, higher would be their productivity. This finding was in line with the findings of *Laharia (1978), Reddy (1982), Reddy (1986) and Sundaraswamy (1987)*. But this finding was not in line with the findings of *Janardhana (1979) and Jhansi (1985)*. Achievement motivation force the individual to work consistently towards reaching some goals which they have carved for themselves. Higher the achievement motivation, higher will be his efforts. Another aspect of achievement motivation is that, people with higher level of motivation perform duties mainly for self satisfaction and not for recognition or money. These are secondary to them. In the process, he tries to excel over others and thus end up with higher productivity.

The existence of ability and knowledge does not by itself guarantee that the individual will put forward his best efforts. There is another factor motivation, which helps in determining the efforts, which can reasonably be expected from him. Therefore, achievement motivation and work productivity goes hand in hand.

The organisational climate as perceived by agricultural scientists had a positive and highly significant relationship with their overall scientific productivity. This finding was supported by the findings of *Talukdar (1984), Reddy (1986), Sundaraswamy (1987) and Halkatti (1991)* but not supported by the findings of *Jhansi (1985)*. In general, positive and facilitating climate in an organisation should help an individual to perform better leading to higher job performance. The

facilitating type of organisational climate may be attributed to some of the good features of the agricultural university such as better salary, well defined work in teaching, research and extension, moderate level of workload, and absence of strict bossism.

In addition, a better climate facilitated for better relationship among individuals in an organisation both horizontally and vertically. The managerial aspects are also taken care of in a judicious manner. The trust deposed in the individuals, the concept of decision making also go a long way in the better performance and hence such positive relationship may be expected.

The findings of the present study imply that the organisational climate of the Agricultural University was found to be favourable and encouraging as perceived by the scientists. Hence it was possible to find a significant positive relationship between the perceived level of organisational climate of the scientists and their job performance.

A positive and highly significant relationship was observed between organisational commitment and scientific productivity of Agricultural Scientists. This finding was in agreement with the studies of *Reddy (1986), Sundaraswamy (1987) and Halkatti (1991).*

Organisational commitment of agricultural scientists could be interpreted as his identification with or an involvement in the university organisation. Such a commitment to the organisation by them could have enabled them to perform their roles in an effective manner.

The individuals who perceive their job as good and emotionally attaches themselves to the ideas of the organisation as a service to the community, do better on the job. The psychological identification of the individual with the organisation to which he is a member is most important to safeguard the interests of that organisation. Such an identification makes an individual to feel proud of his organisation and give his best to the organisation in order to enhance its reputation in the eyes of public. The scientists working in the Agricultural University are no exception to this fact. Hence, a positive relationship between organisational commitment of Agricultural Scientists and their productivity is seen. This implies that the Agricultural Scientists tended to be more committed to the University of Agricultural Sciences, Dharwad with corresponding increase in their scientific productivity. In other words as one's commitment to the organisation increases, his productivity on the job also increases accordingly.

The results of Table 4 indicate a positive and significant association between job involvement of Agricultural Scientists and their level of scientific productivity. This indicates that for better scientific productivity, the employees must necessarily be highly involved in their job.

A feel of serious concern of one's job induces the individual to realize that it is his responsibility to do the job and not an obligation. When once the responsibility of a job is felt, it always results in good performance. The realisation of one's responsibility in the job allows the individual to take things in the right sense. In other words, it makes him to completely identify with his job, establishing a relationship between job involvement and scientific productivity.

The job of extension personnel, particularly that of agricultural scientists being a challenging profession, demands full efforts in order to get acquainted with the day to day developments and research results, which

Table 4. Correlation between independent variables and dependent variable – Overall scientific productivity

S. No.	Characteristics	Overall scientific productivity ('r' values)		
		T	R	EW
1	Education	0.262	0.007	0.046
2	Experience	0.286	0.161	0.263
3	Job autonomy	0.174	0.194	0.541**
4	Task identity	0.093	0.249	0.141
5	Personal importance	0.153	0.242	0.328*
6	Achievement motivation	0.233*	0.242*	0.331*
7	Organisational climate	0.244**	0.206*	0.269*
8	Organisational commitment	0.228**	0.289*	0.243*
9	Job involvement	0.203*	0.201	0.223*
10	Job satisfaction	0.207*	0.076	0.228*
11	Organisational stress	-0.228*	-0.296*	-0.209*
12	Job stress	-0.248*	-0.226*	-0.230*

Note:
T=Teachers, R=Researchers, EW=Ext.workers

calls for a greater degree of involvement. It is quite natural that those who involve more in their job may be out of necessity or force or out of interest identify themselves with their job and perform them better. *Siegal and Ruh (1973), Sundaraswamy (1987) and Halkatti (1991)* reported similar findings.

Job satisfaction of Agricultural Scientists exhibited a positive and significant relationship with their scientific productivity in the present investigation. This implies that Agricultural Scientists tended to be better performers of their job, if they are satisfied with their job.

This finding was in concurrence with the findings of *Reddy (1986), Talukdar (1984), Reddy (1986), Sundaraswamy (1987) and Halkatti (1991)*. However, this finding is in contradiction with that of *Reddy (1982) and Jhansi(1963).*

In general, job satisfaction and performance go together. It is logical to expect that those people who are satisfied with their job are likely to perform their job in a better way since they enjoy in doing it. Naturally the efficiency of the job increases leading to better productivity. Hence the type of relationship observed between these variables is most expected one.

There was a negative and significant relationship between perceived organisational stress and job stress by the agricultural scientists and their Scientific Productivity. This implies that the scientists who perceived higher organisational and job stresses in the university, have a lower level of scientific productivity. In other words as stress increases, productivity decreases.

Organisational stress and job stresses are not independent of each other in their effect. Some experience stress when exposed to a particular stimulus situation whereas others seem 'immune' to stress inducing qualities of the same stimulus situation. In the present investigation, the indicators of organisational stress were related to organisational policies, observational of formalities, frequency of changes, office work situations and types of leadership. The indicators of job stress were related to role conflict, role ambiguity, work over load, work under load, responsibility for people, time pressure and working conditions. Based on the degree of perception of these stress factors by the Agricultural Scientists, their organisational stress and job stress scores were determined.

According to the results of the present study, it can be inferred that the agricultural scientists with different levels of scientific productivity were affected by both organisational and job stress factors. In other words, the scientific productivity of Agricultural Scientists was less who experienced greater amount of job and organisational stresses and vice-versa. Since there happens to be scant research studies particularly in our country to the best knowledge of researcher, which have explored the relationship between scientific productivity and stress factors, it is difficult to confirm the present results. Further, this limits the interpretation and/or identification of reasons for the significant association of organisational and job stress with scientific productivity agricultural scientists.

Radhakrishnamoorthy (1987) and *Sundaraswamy (1987)* have reported non-significant relationship between organisational and job stress with performance. However, in the present study a negative association between stress and performance is revealed. This seems logically valid as stress might be due to certain organisational as well as job factors. Adverse things such as symptoms of organisational and job stresses may be felt by agricultural scientists. Further, the agricultural scientists have failed to cope effectively with excessive demands and conflicting expectations, consequently they might have encountered difficulties in meeting the demands of their job. These might be probable reasons for the negative significant relationship of organisational and job stresses with overall scientific productivity of agricultural scientists.

The variables which did not have significant relationship with the scientific productivity are examined here. It is observed from the results presented in Table 4 that education level, length of experience, job autonomy and task identity were non-significantly associated with their overall scientific productivity.

This may be due to the fact that the scientists will have by and large similar education level at the time of recruitment; their length of experience is quite enough to perform well and non interference type of administration and task identity is well set and streamlined. The findings are in agreement with the studies of earlier researchers, *Laharia (1978), Jhansi (1985), Halkatti (1991) and Chandargi (1996).*

CONCLUSION

Hence, it may be concluded that the level of scientific productivity of agricultural scientists was neither too high nor to low. However, the present study clearly proves that the personal, socio-psychological and organizational related factors have a pronounced effect on productivity and job perspective. This implies the need to improve the level of scientific productivity of agricultural scientists specially those who were in medium and low level categories, by taking cognizance of these factors of human element.

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