Factors Affecting Research and Extension Linkage in Veterinary Universities in India

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Abstract

The effective research-extension linkage in agriculture and veterinary universities depends on multiple factors. To analyze such factors, the present study was carried out with a sample of 80 researchers and 40 extensionists from four veterinary universities in India. The correlation and regression analysis revealed that most of the dimensions of functional R-E linkage were less affected by the selected profile characteristics of respondents. Their information accessibility, job-experience, training/seminar familiarity and perception of management have a positive and significant relationship with linkage strength. So, these factors should be addressed by the university to strengthen and design effective linkage strategies for research and extension.

Keywords: Correlation-regression, Research-extension linkage, Veterinary University.

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Introduction

Agricultural-research and agricultural-extension are dependent on each other for successful operation. Research focuses on the technical aspects for generating useful technologies, while extension focuses on the acceptance and adoption of those technologies by users (Agbamu, 2000). The success in agricultural development can come about only through combined efforts and hence it is essential to foster continuously strong extension and research linkages. In reality, the agricultural technology systems of many developing countries suffer from weak linkages. In most developing countries including India, communication between public research and extension agencies is weak and by and large through farm journals, magazines and extension literature (Jaiswal and Das, 1981; Surendran, 1982 and Anonymous, 1984).

On the other hand, there is no single factor and formula for effective linkage between agricultural research and technology transfer system. However, to make good decisions about linkage, the institutions need to diagnose the factors present in particular settings. Thus, keeping in view the above facts the present study was undertaken.

Materials and methods

In the present study, an attempt was made to study the relationship between the socio-personal and professional characteristics of the university professionals involved in research and extension and linkage strength between them by using Ex-post-facto research design. Four veterinary universities *viz.*, Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana; West Bengal University of Animal and Fishery Sciences (WBUAFS), Kolkata; Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Chennai and Maharashtra Animal

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and Fishery Sciences University (MAFSU), Nagpur were selected purposively during year 2017-18, to cover four main geographical regions of India. A list of research personnel who were carrying out or completed at least one research project was prepared based on the available secondary data *i.e.,* annual reports, vision documents, and others along with online-data accessible from the official website of the selected universities. A total of 80 research personnel comprising of 20 each from the selected universities was randomly selected from the list. Similarly, a total of 40 extension personnel comprising 10 from each selected university, were randomly selected for the study. The data were collected using pre-tested, semi-structured questionnaire through the direct interview from respondents who were accessible at university main campus and nearby colleges and through e-mail from respondents who were at constituent university institutes located far away from the main campus.

The research-extension linkage was measured with the help of developed "research-extension linkage index" incorporating different dimensions of linkage, *i.e.,* communication, teamwork, decision making, supply and service, planning, implementation and evaluation and training (Kumar, 1999 and Singh, 1994). The

percentage extent of linkage perceived by each respondent in all above-mentioned dimension was calculated to study the strength of R-E linkage. Selected variables related to the socio-personal and professional profile of research and extension personnel were taken as independent variables and an effort was made to study their effect on the extent of functional linkage as dependent variables through correlation and regression analysis.

Results and discussion

The zero-order correlation and multiple-regression were employed to study the relationship between selected socio-professional characteristics of respondents as independent variable and extent of linkage as the dependent variable and hence, factors affecting the functional linkage between research and extension in veterinary universities were identified. The data and findings so obtained are presented in Tables 1 and 2 and accordingly discussed. The variables like age, job experience, information accessibility, and job satisfaction were found to be significantly associated (at 5%) with the extent of communication linkage between research and extension in studied universities. The remaining variables had a non-significant correlation. Among all the significantly associated variables, age had a negative significant relationship. When subjected to multiple regression analysis, only 2 out of 14 independent variables, i.e. job-experience and job-satisfaction were found to significantly (at 5%) affecting the extent of communication linkage. The variation in the extent of communication linkage was predicted to the extent of 46 percent when all 14 variables were taken together. A significant F-value for the corresponding R^2-value

indicated a good fit of the equation. From this finding of correlation and regression analysis, it could be concluded that university personnel with relatively greater and satisfying job experience had a good extent of communication linkage.

From the same table, it could be observed that only variable, i.e., perception of management was found to be significantly (at 5%) associated with R-E linkage strength related to teamwork, while multiple regression analysis reveals none of the selected variables have a causal influence on the similar linkage dimension. All the selected 14 variables could predict only to the extent of 25 percent in the variation of the dependent variable. The non-significant F-value for R^2-value indicated that the model did not prove the good fit. This finding led to the conclusion that teamwork linkage between research and extension personnel of studied universities was less affected by their selected socio-personnel and professional profile characteristics. In case of the third dimension of R-E linkage, i.e., decision-making process the variable like; job experience and age were found to have a significant association (at 5%) with the extent of functional linkage and 'information accessibility' was significantly co-varied at 1 percent level of significance. However, on regression analysis, none of these independent variables have a significant influence on the dependent variable. With non-significant F-value the R^2- value was to the extent of only 23 percent. Similarly, regarding linkage in planning the two variables; job experience and information accessibility were found to have a significant association (at 1%) with the extent of functional linkage, and educational qualification was significantly co-varied at 5 percent level of significance.

Table 1: Correlation between independent and dependent variables

SN	Variables	Parameters of Linkage (correlation coefficient)							
		Com	TW	DM	PL	SS	IE	TR	OA
1	Age	−0.2443**	0.1674	0.3225**	0.2119	−0.2152**	0.0805	0.1828	0.1633
2	Gender	0.0246	0.0598	0.0988	0.1402	0.0188	0.1417	0.0809	0.0819
3	Educational qualification	0.1135	0.1036	0.2063	0.2467**	0.1820	0.1513	0.2574**	0.1972
4	Job experience	0.2143**	0.1441	0.3705**	0.5431*	0.0632	0.0818	0.2084	0.2237**
5	Rural residence	0.0031	0.1213	0.0458	0.0137	0.0437	0.0232	0.0628	0.0899
6	Training/seminar attended	0.0577	0.0527	0.0163	0.1494	0.1556	0.1375	0.1872	0.2996**
7	Technology developed	0.0728	0.0071	0.0703	0.0596	0.0147	0.0130	0.0273	0.0786
8	Patents/copyright	0.1192	0.0266	0.1062	0.0270	0.0161	0.0243	0.0822	0.0203
9	Publications	0.1917	0.1469	0.1668	0.1370	0.1253	0.0814	0.0937	0.1103
10	Information accessibility	0.3366**	0.2277	0.4624*	0.4192*	0.2387**	0.1757	0.0115	0.2121**
11	Value orientation	0.0017	−0.0420	-0.0239	-0.0487	-0.0725	-0.1490	-0.1432	−0.0499
12	Achievement motivation	0.1312	0.1062	0.1109	0.0508	0.0798	0.0581	0.2379**	0.1143
13	Perception of management	0.1303	0.2425**	0.1106	0.1369	0.2351**	0.1588	0.1768	0.2785**
14	Job satisfaction	0.2293**	0.1948	0.1081	0.0912	0.1453	0.1515	0.2269**	0.1451

*= significant at 1% level of significance, **= significant at 5% level of significance
(Com= Communication, TW=Team-work, DM=Decision-making, PL=Planning, SS=Supply-services, IE=Implementation-evaluation, TR=Training, OA=Overall Linkage)

Table 2: Multiple regression coefficients of selected independent variable with the extent of functional linkage

SN	Variables	Parameters of Linkage														
		Communication		Team Work		Decision Making		Planning		Supply & Services		Implementation Evaluation		Training		Overall	
		B	T	B	T	B	T	B	T	b	T	b	T	b	T	b	T
1.	Age	-1.5382	1.1163	0.7941	1.5758	0.3161	0.4929	0.1707	0.9146	-2.4375	1.9203**	0.5630	1.0597	0.2555	0.9087	0.8234	1.5331
2.	Gender	0.0948	0.9255	0.0321	0.0575	0.6364	0.9543	0.4320	0.7351	0.5018	1.0871	0.1001	0.1411	0.9115	1.5343	0.0344	0.0794
3.	Educational qualification	0.064.	0.1623	0.4211	0.7140	0.3570	0.8206	0.6948	1.9255**	0.1352	0.2435	0.2502	0.4057	0.5088	0.9661	0.5374	0.9573
4.	Job experience	8.2196	1.7346*	0.4045	0.9720	5.5440	1.2990	0.8131	2.4080*	0.0969	0.2101	0.2854	0.1403	0.1716	1.0452	8.7739	2.0335*
5.	Rural residence	0.1159	0.2272	0.8811	0.8577	0.1637	0.3556	0.6348	1.5270	0.1001	0.1411	0.0321	.0575	0.4320	0.7351	0.4077	0.9676
6.	Training/seminar attended	0.0294	0.0847	0.0131	0.0391	0.2709	0.2249	2.3010	1.2820	2.0040	1.2947	0.3094	0.2550	1.1680	0.8602	2.1291	1.1711*
7.	Technology developed	0.5066	0.5704	1.0967	0.7259	0.1361	1.0404	0.0259	0.1163	0.1747	0.2526	0.3552	1.0410	0.1127	0.3449	0.1374	0.3116
8.	Patents/copyright	-1.1371	1.0432	-1.5062	0.1714	0.0694	0.0098	-1.7460	1.1863	0.0726	0.0945	-.2263	1.2273	0.0219	0.0371	0.0437	0.2693
9.	Publications	0.3011	0.2797	0.0618	0.0385	0.6872	1.5679	0.0402	0.0590	0.2101	0.7964	0.0559	0.1665	0.1779	0.5758	0.3140	0.4582
10.	Information accessibility	2.6291	0.6494	0.3619	0.1390	3.5800	1.5273	4.6134	0.8955	4.5113	1.3494	0.7085	0.3859	1.4709	0.3970	6.4137	2.7066*
11.	Value orientation	0.1494	0.4582	-0.1402	0.2242	-0.0457	0.0848	0.0959	0.1828	-1.0016	1.1184	0.7017	1.7196**	-0.1977	0.1941	-1.2830	1.4195
12.	Achievement motivation	-.08897	1.4627	0.0694	0.0098	0.1835	0.3301	-0.0245	0.0210	0.0224	1.5169	0.6137	0.6328	1.1896	2.2735**	-0.0947	0.1463
13.	Perception of management	0.1533	0.7700	-0.4677	1.1558	0.7335	0.8839	-1.2572	0.8562	4.2201	1.0941	0.1448	0.1574	0.4431	1.7288**	-2.6713	0.5350
14.	Job satisfaction	-3.8648	1.0058**	0.0203	0.0609	-1.8617	1.0201	-0.7925	0.8326	-0.1636	0.9720	0.1959	0.8400	1.2891	1.3901	-0.0299	0.2342
	R2 Value (F value)	0.46 (2.01**)		0.25 (0.84NS)		0.23 (1.13NS)		0.33(1.40NS)		0.26(1.09NS)		0.28(0.97NS)		0.37(1.27NS)		0.42 (1.86**)	

*= significant at 1% level of significance, **= significant at 5% level of significance

Also, the multiple regression analysis revealed that educational qualification (at 5%) and job experience (at 1%) of respondents had a significant causative effect on the extent of functional linkage in planning. The R^2-value, in this case, was to the extent of 33%.

With the next parameter, *i.e.,* linkage in supply and services, information accessibility and perception of management were positively and significantly (at 5%) associated, whereas age was negatively and significantly (at 5%) correlated. Except for value orientation, rests of other variables were having a positive but non-significant association. But multiple regression analysis showed only the age of the respondent had significant (at 5%) influence on the extent of linkage in supply and services between university-research and university-extension. With non-significant F-value, the R^2- value was again found to be as low as 26%.

It was interesting to note that correlation analysis showed none of the selected independent variables was found to be significantly associated with the extent of linkage in implementation and evaluation but regression analysis revealed value orientation of respondent had significant (at 5%) causative effect on the same dimension of linkage strength.

Regarding training, the last identified aspect of R-E linkage in veterinary universities, variables like educational qualification, achievement motivation and job satisfaction significantly co-varied (at 5%) with the extent of functional linkage. The multiple regression analysis on this aspect showed achievement motivation and perception of management had significant (at 5%) influence on strength of linkage in training but, unlike correlation analysis, educational qualification and job satisfaction were found to be having a non-significant influence on the same. The selected 14 variables could predict up to 37% variation in dependent variable in this case.

Finally, the overall extent of functional linkage between research and extension in studied universities was observed to be associated with several identified profile characteristics of respondents. Out of total 14 studied independent variables four *viz.,* 'job experience', 'training/seminar attended', 'information accessibility' and 'perception of management' were found significantly associated (at 5%) with the strength of overall functional linkage. Similarly, the multiple regression analysis revealed 'job experience', 'training/ seminar attended', 'information accessibility' had a significant influence on the dependent variable. The R^2-value was 0.42 and it was significant at 5% level of significance. It means that all the set of independent variables could predict only to the extent of 42% in the variation of the dependent variable.

From the above findings, it could be noted that most of the dimensions of functional R-E linkage under the study were less affected by the selected profile characteristics of respondents. Few of the variables like information accessibility, job experience, age and perception of management were found to have exerting influence on the linkage strength. Singh (1994) while studying R-E linkage between State Agricultural University and State Department of Agriculture and Animal Husbandry in Uttar Pradesh reported that the extent of linkage was positively and significantly correlated with age, education and training experience of respondents. Similarly, Kumar *et al.,* (2002) reviewing factors affecting research-extension linkage revealed the existence and influence of numerous factors on linkage strength; some important variables were attitude, training received and job-satisfaction of respondents.

Conclusion

The present study highlights that certain socio-personal and professional characteristics of university research and extension professionals like; information accessibility, job-experience, training/seminar familiarity and perception of management exert influence on the extent of linkage among them. So, these factors should be properly manipulated by the university to strengthen and design effective linkage strategies for research and extension.

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