



Developing teaching effectiveness framework for social sciences in agricultural universities

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ABSTRACT

For appropriate technology dissemination to farmers, social sciences in agriculture especially Extension Education act as a bridge connecting researchers and farmers therefore, the aim of post graduate courses at agricultural universities is to develop suitable human resource with desired competencies to enable effective extension work. As teaching effectiveness is crucial for achieving academic excellence and to inculcate desired competencies among students, the attributes of teachers contributing towards teaching effectiveness need to be analysed. This study was conducted during 2019 and examines the perception of 210 postgraduate (M Sc and Ph D) students across 10 agricultural universities of Northern India. Teachers were categorized based on scores of attributes obtained through student ratings. The association between teacher attributes and overall teaching effectiveness was calculated and finally a teaching effectiveness framework was designed based on those attributes, which were significantly associated with teaching effectiveness. It was also found that majority of students rated overall teaching effectiveness under medium category (48.09%) followed by high category (34.76%). In addition, all attributes were found to be positively correlated with overall teaching effectiveness. Out of 32 items under all attributes, 27 items which were significantly associated with teaching effectiveness were included in teaching effectiveness framework. In light of the findings, suggestions were also formulated for teachers regarding their teaching attributes as perceived by students.

Keywords: Student ratings, Teaching effectiveness, Teaching effectiveness framework, Teachers' attributes

Extension Education has established itself as a discipline and profession. Today in India, Extension researches and teaching are being practised by teachers and students in State Agricultural Universities (SAUs), Deemed to be Universities (DUs), Central Agricultural Universities (CAUs) and Central Universities (CUs) with Agriculture Faculty. Agricultural Extension services provide critical access to the knowledge, information and technology that farmers require to improve the productivity and thus improve the quality of their lives and livelihoods (Ponnusamy 2013). In order to develop agricultural students with appropriate skills and attitude, high teaching quality in agricultural education has been an important concern, so that food security for all can be ensured in long run (FAO 2014). Teaching in Agricultural Extension discipline across agricultural universities at postgraduate level prepares extension professionals to conduct need-

based research and transfer relevant technologies to farming community. There has been a paradigm shift in agricultural extension which needs different set of competencies on part of agricultural students who are passing out from different agricultural universities so that they can fulfil the need of farmers adequately (Kokate *et al.* 2016). Though Extension researches and teaching are being practised by teachers and students in more than 70 Agricultural Universities but the linkage between extension education and extension practices is uncoordinated and ineffective (Ferroni and Zhou 2012). The Fifth Deans' Committee Report of Agricultural Education Division, Indian Council of Agricultural Research (2017) also noted the constraints in teaching effectiveness with special reference to Social Sciences among agricultural universities.

Teaching effectiveness provides support for formative decisions related to improvement in teaching quality and summative decisions including overall performance of a teacher and promotion related verdicts (Berk 2005). Therefore, it is important to understand the traits and qualities of the teachers, which are looked upon by the students as their strength of teaching, whereas it is equally important to identify the segments of teachers' personality attributes and pedagogical approaches where students are

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not satisfied. Thus, to evaluate the teachers' characteristics, their impact on students' learning and overall teaching effectiveness this study has been conducted to finally construct a teaching effectiveness framework.

MATERIALS AND METHODS

In India, there are 75 universities where agriculture as a subject is being taught. The present 75 universities are distributed among North zone, South zone, East zone, West zone, Central zone and North-East zone. Universities located in North zone were the universe of the present study, which comprises of 23 universities having agriculture as a subject and located in Jammu and Kashmir, Himachal Pradesh, Punjab, Uttarakhand, Uttar Pradesh, Haryana and New Delhi. Ten universities from universe were selected randomly where the present study was conducted (2019). These universities included Govind Ballabh Pant University of Agriculture and Technology Pantnagar, Uttarakhand, Indian Agricultural Research Institute, New Delhi, Punjab Agricultural University Ludhiana, Punjab, Indian Veterinary Research Institute, Bareilly, Uttar Pradesh, National Dairy Research Institute Karnal, Haryana, Chaudhary Charan Singh Haryana Agricultural University Hisar, Haryana, Sher-e-Kashmir University of Agricultural Sciences and Technology Jammu, Jammu and Kashmir, Chandra Shekhar Azad University of Agriculture and Technology Kanpur, Uttar Pradesh, Sam Higgin bottom University of Agriculture, Technology and Sciences Naini, Prayagraj, Uttar Pradesh and Banaras Hindu University Varanasi, Uttar Pradesh. All post graduate students (M Sc and Ph D) of Extension Education discipline from selected 10 universities were the respondents for the present study. Therefore, one stage cluster sampling was followed for the present study to collect primary data from 210 students of selected universities in North zone through a scientifically developed and pre-tested questionnaire.

Based on literature review and focused grouped discussion, total eight attributes (seven teacher attributes and one attribute related to the course being taught) were identified for inclusion in the student evaluation questionnaire. It included teacher preparedness, teaching pedagogy of course, teacher's attitude towards students, teacher's attitude towards teaching, teacher's creativity, teacher's fairness, teacher's availability to students and course characteristics. Each attribute was measured by four statements, therefore a total of 32 statements were framed. To measure overall teaching effectiveness, four separate statements were selected on the basis of ratings of experts. All statements were measured on five-point ratings Likert scale. The weighted mean score of every statement was calculated by using formula as follows

$$\text{Weighted mean} = \frac{\sum wx}{\sum w}$$

where, Σ = summation, w = the weights, x = the value.

The overall weighted mean score of each attribute was compared to finally rank these eight attributes on the basis of perception of students. Teachers were categorized

under high, medium and low on the basis of mean and standard deviation of scores. Pearson Moment Correlation, ANOVA and multiple hierarchical regressions were used to find associations of items and teachers attributes with overall teaching effectiveness and to test the significance. The standardized steps of formulating research-based framework developed by McGaghie *et al.* (2001) were followed to formulate framework for effective teaching on the basis of associations of teachers' attribute with teaching effectiveness as follows

Step I: Identification and scoring of overall teachers' attributes and items under teachers' attributes: Based on literature review, focused grouped discussion with experts and pretesting total eight attributes (seven teachers' attributes and one attribute related to the course being taught) with four items each, were identified. It included Teachers' preparedness, Teaching pedagogy of course, Teachers' attitude towards students, Teachers' attitude towards teaching, Teachers' creativity, Teachers' fairness, Teachers' availability to students and Course characteristics.

Step II: Testing relationship of teacher's attributes with teaching effectiveness: The association between teachers' attributes on which students had given their ratings and overall teaching effectiveness was calculated through correlation and multiple regression analysis. Pearson correlations were computed between all attributes and overall teaching effectiveness to test for direction and strength of the correlation.

Step III: Testing relationship of items under teachers' attributes with teaching effectiveness: All items (32) under eight teaching attributes were individually tested for their significant relationship with teaching effectiveness using multiple regression analysis.

Step IV: Formulating teaching effectiveness framework on the basis of teachers' attributes: Those items which were found significant were included in final framework of teaching effectiveness

RESULTS AND DISCUSSION

Categorization of teachers: On comparison of weighted mean score of all eight attributes it was found that the students had ranked "teachers' fairness in grading", "teachers' attitude towards teaching" and "teachers' attitude towards students" in first three ranks consecutively which indicates that overall, teachers' were fair in grading, had shown high enthusiasm towards teaching, regarded teaching as a noble profession and were responsive to students' questions. The students had ranked "teachers' preparedness" and "course characteristics" in next two ranks as fourth and fifth with weighted mean score above three. This indicates that students had average satisfaction regarding course requirement coverage, theory integration with practical's, assignment adequacy, up gradation of course curriculum, teachers' preparation of lecture schedule, arriving and leaving time of teachers in class and teachers' preparation for each class.

The students had ranked "teachers' availability to

students”, “teaching pedagogy of course” and “teachers’ creativity” in last three ranks as sixth, seventh and eighth respectively with weighted mean scores less than three. This clearly indicates that teachers had not used diverse methods of teaching, had not harnessed multi-media tools effectively and the teaching methods had not generated desired skills among students’ up to satisfactory level. The last rank of “teachers’ creativity” indicates that majority of the teachers’ had not used innovative teaching methods and material for generating new ideas. The teacher’s attributes were divided into three categories (low, medium and high) on the basis of student’s ratings. It is evident from the Table 1 that majority of the students had categorized “teachers’ fairness in grading” (57.61%), “teachers’ attitude towards teaching” (43.33%) and “teachers’ attitude towards students” (37.14%) under high category respectively. Thus, it can be concluded that teachers had high level of fairness in grading, had positive attitude towards teaching and students.

Data (Table 1) shows that majority of the students had categorized “teacher preparedness” (51.90%), “teachers’ availability to students” (45.71%) and “course characteristics” (38.57%) under medium category. Majority of students categorized “teacher’s creativity” (45.25%) and “teaching pedagogy of course” (43.34%) under low category which indicates that teachers had low level of creativity and had not used appropriate teaching pedagogy. Majority of students rated “overall teaching effectiveness” under medium category (48.09%) followed by high category (34.76%). Overall, it can be concluded that teachers had medium to high level of teaching effectiveness.

Association between teachers’ attributes and overall teaching effectiveness: It is evident (Table 2) that all attributes were found to be positively correlated with overall teaching effectiveness.

Multiple regression analysis indicated that four attributes namely “Teacher preparedness”, “Teaching pedagogy of course”, “Teachers’ availability to Students” and “Course characteristics” were positively correlated and significant at 1% level of significance (P<0.01) with overall teaching effectiveness. While four other attributes,

namely “Teachers’ attitude towards students”, “Teachers’ attitude towards teaching”, “Teachers’ creativity” and “Teachers’ Fairness in grading” were positively correlated and significant at 5% level of significance (P<0.05)

Teaching effectiveness framework: Once all attributes were found to be positively correlated with overall teaching effectiveness then for developing the framework, each item under all attributes was checked for significant association with overall teaching effectiveness. Out of 32 items, 27 items were found significantly correlated with overall teaching effectiveness (four items were significantly correlated at 1% level of significance and 23 items were significantly correlated at 5% level of significance). Those statements which were found significant were included in final framework of teaching effectiveness (Fig 1).

The findings of the present study are consistent with previous research, especially in case of support

Table 2 Correlation and regression coefficients of all teachers’ attribute contributing towards teaching effectiveness

Teachers’ attribute	Estimate (B)	Standard error	Correlation coefficient (r)	Significance (p)
(Constant)	0.076	1.370	-	0.0371
Teacher preparedness	1.361	0.043	0.31786	0.0046**
Teaching pedagogy of course	1.226	1.311	0.22117	0.0085**
Teachers’ attitude towards students’	0.327	0.443	0.10023	0.0353*
Teachers’ attitude towards teaching	0.561	0.227	0.19327	0.0311*
Teachers’ creativity	0.174	1.061	0.11287	0.0347*
Teachers’ fairness	0.781	0.672	0.13674	0.0258*
Teachers’ availability to students’	1.012	0.323	0.22563	0.0098**
Course characteristics	1.007	0.008	0.18941	0.0019**

**Significant at 0.01% level of significance, *significant at 0.05% level of significance

Table 1 Categorization and ranking of teachers based on students’ ratings on teachers’ attributes (n=210)

Teachers’ attributes	WMS	Rank	Category					
			High		Medium		Low	
			Freq.	%	Freq.	%	Freq.	%
Teachers’ preparedness	3.45	IV	56	26.66	109	51.90	45	21.44
Teaching pedagogy of course	2.42	VII	51	24.28	68	32.38	91	43.34
Teachers’ attitude towards students’	3.48	III	78	37.14	61	29.04	71	33.82
Teachers’ attitude towards teaching	3.84	II	91	43.33	54	25.71	65	30.96
Teachers’ creativity	2.07	VIII	58	27.61	57	27.14	95	45.25
Teachers’ fairness	4.07	I	121	57.61	67	31.90	22	10.49
Teachers’ availability to students’	2.97	VI	72	34.28	96	45.71	42	20.01
Course characteristics	3.24	V	62	29.52	81	38.57	67	31.91
Overall teaching effectiveness	3.45	IV	73	34.76	101	48.09	36	17.15

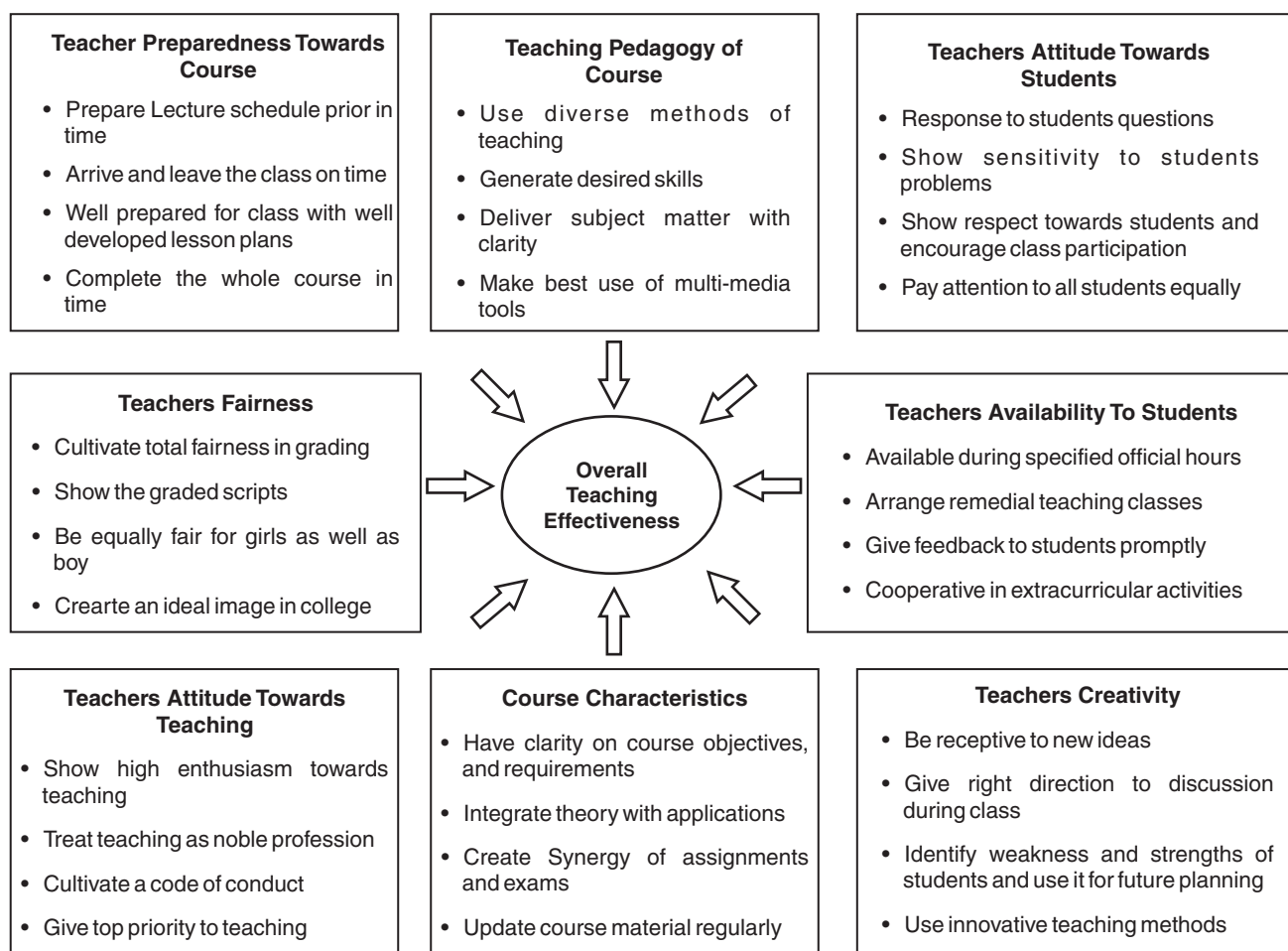


Fig 1 Teaching effectiveness framework on the basis of teachers' attribute.

for teacher preparedness, teaching pedagogy of course, teacher's attitude towards students, and teacher's attitude towards teaching (Galbraith *et al.* 2012). Some attributes have not been largely empirically examined in previous studies such as teacher's creativity, teacher's fairness, and teacher's availability to students, and course characteristic. Therefore, this study contributes in providing empirical evidence for these attributes within the agricultural education setting. Based on the conclusions from this study, some recommendations were formulated for teachers of agriculture universities and teacher training institutions. The results of this study are also useful for policymakers who are addressing the issues of recruitment and retention of teachers, structuring their works, improving teacher training system and trying to develop effectiveness of teaching in Indian National Agricultural Research and Education System (NARES). The most important recommendations of this study are:

Teachers should consider all teachers' attributes and attempt to increase their performance in those attributes where students have perceived them comparatively low; Teachers should frame specific lesson plan for all courses and should use diverse teaching methodologies including

problem solving approach, experiential learning methods, case studies, rural visits and sensitivity methods; Teachers' can consider teaching effectiveness framework developed from the outcomes of present study and can use it as cross reference for their overall preparation, so that teaching effectiveness can be further enhanced; Teacher training institutions should concentrate on teachers' attributes revealed by this study and should try to develop capacity of teachers in these attributes; Authorities in universities should include these attributes in their teacher's evaluation process and should generate relevant data to further investigate and improve process of teacher's evaluation.

Overall, this study can make an important contribution to agricultural education field in three ways. Firstly, it will help existing teachers and researchers of National Agricultural Research and Education System to assess themselves with the help of teachers' attributes generated by this study. Secondly, teachers can cross check their teaching preparation by comparing their strategy with teaching effectiveness framework developed by this study and thirdly authorities can utilize the present finding and teaching effectiveness framework in their teacher's evaluation process and to revise the course curriculum.

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