



Competency of Faculty Members in Online Teaching of Agricultural Undergraduates during COVID-19 Pandemic: A study in North-East India

Progati Borah¹ and Loukham Devarani^{2*}

¹P.G Scholar, ²Associate Professor, School of Social Sciences, College of Post Graduate Studies in Agricultural Sciences (Central Agricultural University, Imphal), Umiam-793103, Meghalaya, India

*Corresponding author email id: loukham.d@gmail.com

ARTICLE INFO

Keywords: Agricultural undergraduate, Competency, COVID-19, North East India, Online teaching

<http://doi.org/10.48165/IJEE.2022.58105>

ABSTRACT

Quality education is crucial for growth and development of a nation. Teaching learning process worldwide which was disrupted by COVID-19 pandemic has found consolation through online remote teaching. Competency of teachers plays an important role in the success of online teaching. The study was conducted in North Eastern region (NER) of India to assess the faculty members' competency in online teaching of agricultural undergraduates. For the study, all the teachers of institutes in NER imparting undergraduate level degree course in Agriculture were selected. Online questionnaire was sent to all the teachers of which 75 responses were received, which formed the respondents of the study. Five online teaching competency dimensions were considered for the study. The respondents had highest mean competency score in Teaching Ethics and lowest in Content Facilitation. Online teaching competency had significant and positive correlation with online teaching experience; attitude towards online teaching; and organisational facilities & support. The study recommends providing organizational facilities and support in the form of adequate infrastructure and conducting trainings on awareness and usage of e-teaching resources and tools to improve the online teaching competency of the teachers.

INTRODUCTION

The Coronavirus Disease of 2019 (COVID-19) caused by the noble coronavirus, first reported in Wuhan province of China during December 2019 has created a crisis situation worldwide. Challenges posed by this pandemic have introduced all educational institutions to a new world of online learning and online remote teaching. Agricultural Universities in India are also continuing the teaching-learning experiences mostly through online methods. ICAR (Indian Council of Agricultural Research) has been promoting and supporting digital education in AUs (Agricultural Universities), through financial support for creation of infrastructure and capacity building of faculty members. A policy brief authored by Thammi-Raju et al., (2020) highlighted challenges faced by higher agricultural education in India during the pandemic and recommendations for uninterrupted learning

during the pandemic. Building competence of faculty members in digital technology for online teaching, course development & delivery and also on educational psychology to enhance effectiveness of online teaching was one of the recommendations.

Competency is a measurable, individual capability that distinguishes superior, effective accomplishment of a designated function according to a performance definition by an organization for its people; an interactive and complex combination of integrated attitudes, skills, knowledge and ability; behaviours and strategies; traits, motives, thought patterns, self-concepts, values and social roles (Cross, 2010). Teacher's competence in online teaching effects students' interest, motivation, engagement which is directly related to successful learning. Online teachers need to take on a multi-dimensional role and are required to possess a varied and wider

range of competencies (Bawane & Spector, 2014). As online teaching is still new to teachers and students, it is practically impossible for every faculty member to become an expert in online teaching. In context of agricultural education, such competencies are not delineated properly. Identification and assessment of competencies is the starting point for any capacity development intervention. The challenges of this sudden shift to online-teaching are immense and more so in the context of the remote North East Region of India (NER) which was already having many challenges related to higher education and ICT related infrastructure. Imparting undergraduate degree course in agriculture through online mode has its own specific challenges and needs in terms of number of students to handle, courses requiring laboratory and field works, collaborative learning among students etc. The study was taken up to assess the perceived online-teaching competency of faculty members in agricultural institutes of the region.

METHODOLOGY

1. Assam Agricultural University, Jorhat	<ul style="list-style-type: none"> o College of Agriculture, Jorhat o Biswanath College of Agriculture, Biswanath Chariali o Sarat Chandra Sinha College of Agriculture (SCSCA), Dhuburi
2. Central Agricultural University, Imphal	<ul style="list-style-type: none"> o College of Agriculture, Iroishemba, Manipur o College of Agriculture, Pasighat, Arunachal Pradesh o College of Agriculture, Kyrdemkulai, Meghalaya
3. Nagaland University, Zunheboto	<ul style="list-style-type: none"> o School of Agricultural Sciences & Rural Development (SASRD), Medziphema
4. Tripura University, Agartala	<ul style="list-style-type: none"> o College of Agriculture, Agartala
5. Private institutes	<ul style="list-style-type: none"> o Apex Professional University, Arunachal Pradesh o Pandit Deen Dayal Upadhyay Institute of Agricultural Sciences, Manipur o Arunachal University of Studies, Arunachal Pradesh

All the institutes of North East India including the private colleges offering B.Sc. (Agri) degree course form the sampling frame of the study. The institutes are:

Complete enumeration of all the faculty members involved in teaching on a regular or contractual basis was selected as respondents of the study. A list of all the faculty members of the colleges and teachers/ scientist from other colleges/ stations engaged in teaching students of the selected colleges, were made. E-mail addresses of the teachers were procured through the institute websites and other key sources.

Online teaching competency was measured by using a well constructed valid and reliable Likert type scale developed for the study (Borah, 2021). The scale consists of 23 competency items across 5 competency dimensions viz.; Technological; Teaching Facilitation; Teaching Ethics; Session Management and Content Facilitation. Respondents were to rate the competency items on a five (5) point continuum (1=Very Low, 2=Low, 3=Moderate, 4=High and 5=Very High) on the basis of their perceived

competency level in the particular item. Online teaching competency score of a respondent was computed as the sum of his/her competency score in all the competency items. Eleven (11) independent variables which were hypothesized to affect the online teaching competency were selected for the study.

The well constructed pre-tested online questionnaire (Google form) was used for data collection. The online questionnaire was sent to a total of 252 teachers. Within a span of 30 days, responses were received from 75 teachers. These 75 teachers were the final respondents of the study.

RESULTS AND DISCUSSION

More than half of the respondents (58.67%) were aged below 35 years, 29.33 per cent were aged between 35-50 years and remaining 9.00 per cent above 50 years. Responses were received from the younger faculty members who were more at ease with use of online questionnaires. Of the older lot, only few responded. This is also reflected in the fact that the mean age of the respondents was only 39.77 years. Osika et al., (2009) highlighted that senior or older academic members may lack the necessary knowledge or skills to use technology. For elderly or tenured faculty, this creates competency difficulties. The male female ratio of the respondents was 2:1. Nearly half of the respondents (46.67%) were of Assistant Professor or equivalent rank, 28.00 per cent were of Associate Professor or equivalent rank and 25.33 per cent were of Professor or equivalent rank. Majority (58.67 %) of respondents were from Central Agricultural University, Imphal followed by Assam Agricultural University, Jorhat (14.67%). Broad discipline wise distribution of the respondents was as: Social Sciences (24.00%); Horticulture (21.33%); Natural Resource Management (20.00%); Plant Protection (12.00%); Crop Improvement (12.00%) and remaining from basic sciences and other disciplines. The average teaching experience of the respondents was 8.21 years with a range of 2-31 years. Most of the respondents had no experience in online teaching prior to the pandemic so online teaching experience ranged from 2-17 months.

More than half of the respondents had medium level of attitude towards online teaching (64.00%); medium level of awareness and usage of e-teaching resources and tools (65.33%) and medium level of usage of media mix (61.33%). 60.00 per cent respondents stated that received technical assistance only sometimes and 16.00 per cent respondents stated that they never got access to technical support. Around two-third of the respondents (66.07%) expressed receiving medium level of facilities and support from their organisations in regard to online teaching.

Online-teaching competency

The descriptive analysis of the item-wise and dimension-wise online teaching competency scores are provided in Table 1. The results are discussed according to the competency dimensions.

Technological competency refers to a teacher's awareness, efficient utilisation and manipulation of technological tools and equipments (both hardware and software) needed for online teaching. Basic technological competency is pre-requisite for online teaching. Albrahim (2020), Faloon (2020) & Aydin (2005) also stated about technological competence as an important prerequisite for online

Table 1. Mean Competency score of the respondents

S.No.	Competency items	Item-wise mean score	Dimension-wise mean score	Dimension-wise rank score
<i>A Technological Competency</i>				
1.	I have the basic knowledge and skill in handling MS office, search engines, e-mails etc.	4.61	4.26	II
2.	I have skills in using online teaching platforms.	4.40		
3.	I explore and utilize the features of different online teaching platforms.	4.12		
4.	I choose and adapt technology to suit the learners' needs and ability.	4.06		
5.	I use multimedia (pictures, graphics, videos, audios etc) for enhancing my teaching.	4.26		
6.	I use different mix-media strategies (combination of different communication channels like email, WhatsApp, Google meet, YouTube) for maximum reach and impact.	4.36		
7.	I can easily conduct online exam for students (evaluation in the form of online quizzes, online interviews etc.) by using different online platforms.	4.01		
<i>B Teaching Facilitation</i>				
1.	I ensure two way communication and effective interpersonal interaction during online session/ offline sessions.	4.25	4.04	IV
2.	I have the ability to organize and facilitate students' participation in class.	4.20		
3.	I promote one-on-one conversations among students, as well as group/ class discussion.	4.05		
4.	I use different communication methods to ensure my accessibility to my students, & the students with their peers whenever needed.	3.82		
5.	I show sensitivity and empathy when communicating online/	4.16		
6.	I facilitate both asynchronous and synchronous online learning environments.	3.81		
<i>C Teaching Ethics</i>				
1.	I have the desire to teach well, to help facilitate student learn, to be very engaged, and dedicated to students and mission of the institution.	4.61	4.69	I
2.	I consciously try to be fair and unbiased to all students during teaching and evaluation.	4.72		
3.	I respect the cultural differences of students.	4.74		
<i>D Session Management</i>				
1.	I try to solicit & look for students' feedback.	4.18	4.21	III
2.	I provide clear, detailed feedback on assignments & exams that enhances the learning experience.	4.18		
3.	I have the ability to manage the session time and apply time-saving techniques.	4.24		
4.	I design and implement appropriate lesson plans for online teaching.	4.24		
<i>E Content Facilitation</i>				
1.	I provide additional resources that encourage students to go deeper into the content of the course.	4.06	3.86	V
2.	I give assignment to students to engage them in online learning.	4.28		
3.	I encourage students to try simple DIY experiments which can be done at home.	3.26		

teaching. Technological competencies includes ability to use different teaching platform, use of mix media strategies, knowledge in handling MS office, search engines, ability to solve basic technical problems etc. This dimension was ranked 2nd in terms of the mean competency score. There were seven competency items in this dimension and the range of the mean scores was 4.01 to 4.61.

As a facilitator a teacher makes learning the subject matter easy, effective and interesting by adopting different pedagogical methodologies for communication, motivation, attracting attention, fostering active participation, collaboration and learning evaluation. Albrahim (2020); Martin et al., (2019) and Bawane & Spector (2014) reported the importance of facilitating role of an online teacher. Teaching facilitation competencies include the ability to promote learning in an online setting by encouraging and supporting student involvement and interactive online teaching activities. This dimension had the second lowest (4.04) mean score among all the competency dimensions. This dimension has 6 competency items whose mean scores ranged from 4.25 to 3.81. Gupta & Sharma (2020) mentioned teacher's inability to check on each and every student, lack of transparency in conducting online examination and limited assessment and feedback as weaknesses of online teaching.

Ethics are vital for education system. The four primary values at the heart of education are dignity, truthfulness, fairness, and

responsibility and freedom (OAJ, 2021). Faloon (2020) mentioned about personal ethics in which include teaching and assisting students to use online resources in ethical way. Of the 5 competency dimension highest mean score was obtained for teaching ethics (4.69). There were three teaching ethics competency items with mean score range of 4.74 to 4.61.

Session management includes all the functions starting from planning of the session, organizing lessons, enroll learner, asking feedback, ability to manage time, design and implementation of lesson plan, setting classroom rules etc. Guash et al., (2010) and Klein et al., (2004) mentioned importance of management of environment and technology as a competency. There were 4 items under session management competency and as a dimension it ranked 3rd in terms of mean competency score. The competency score of the respondents for the items under session management varies from 4.24 to 4.18.

Content Facilitation is concerned with the ability of the teacher to facilitate content learning through utilisation of various available resources and ingenious techniques that students can employ at their home setting. Goodyear et al., (2001) and Berge (1995) mentioned about content facilitation role in online teaching. This dimension received the lowest mean competency score (3.86). There was three competency items under this dimension and the mean score ranged from 4.28 to 3.26. In a study conducted by Bhati et al., (2020), it

Table 2. Distribution of the respondents according to their online teaching competency (n=75)

Category	Dimensions					Overall competency
	Technological competency	Teaching facilitation	Teaching ethics	Session management	Content facilitation	
Lower quartile (Q ₁) (Low competency)	22(29.33)	23(30.66)	21(28.00)	37(49.33)	20(26.67)	21(28.00)
Inter quartile (Q ₂) (Medium competency)	37(49.33)	48(64.00)	10(13.33)	18(24.00)	27(36.00)	34(45.33)
Upper quartile (Q ₃) (High competency)	16(21.33)	24(32.00)	44(58.66)	20(26.67)	28(37.33)	20(26.67)

*Figure in parenthesis indicate percentage to the total number of respondents
Distribution of respondents according to their competency score

was reported that only one third of respondents were now aware of UGC's e-library (38%) and MOOC (36%) platforms for where e-teaching and learning contents are freely available.

The respondents were categorized according to the quartile deviation of their competency score into three categories as low, medium and high competency. The distribution of the respondents is presented in the Table 2. For technological competency and teaching facilitation competency, majority of the respondents (49.33% and 64.00%, respectively) belonged to medium competency category. In case of Teaching Ethics, more than half of the respondents (58.67%) had high competency score. 49.33 per cent respondents belonged to low competency category in Session Management dimension. There was a more or less equally distribution of respondents in medium (36.00%) and high (37.33%) competency category in Content Facilitation dimension. When the overall competency score was considered, of most of the respondents (45.33%) belonged to medium competency category.

Relationship of online teaching competency with independent variables

Spearman Rank-Order Correlation was employed since some of the variables were not normally distributed and few were in ordinal level of measurement. Results of the test are presented in Table 3. The competency score of the respondents was positively and significantly correlated with online teaching experience; attitude towards online teaching and organisational facilities & support at 0.05 level of significance. Osika (2006) emphasized the importance of support of the entire institution in successful technology programme. The influence of online teaching experience on attitude towards technology and in turn, to effective teaching was described by Osika et al., (2009). The independent variables age; gender; rank; teaching experience; awareness and usage of e-teaching resources and tools; and access to technical support were not observed to

Table 3. Relationship of online teaching competency with independent variable(n=75)

Independent variables	r _s value
Age	-0.022
Gender	0.100
Faculty rank	-0.048
Teaching experience of UG courses	0.011
Online teaching experience	0.242*
Attitude towards online teaching	0.267*
Awareness and usage of e-teaching resources and tools	0.190
Access to technical support	0.014
Organisational facilities and support	0.260*

*Significant at the 0.05 level

have significant relation with competency. This contradicts the report of Osika et al., (2009) and Spotts (1997) that there may be variation in technology use competency according to age and gender respectively. The non-significant correlation with age may however be due to low response from older faculty members due to inability to respond the online questionnaire which is also a technological challenge. A positive relationship between technical assistance and the quality of e-learning in higher education was reported by Elumalai et al., (2021).

CONCLUSION

Online teaching requires competencies distinct from conventional teaching and most teachers are ill-equipped with the sudden shift amid the COVID-19 pandemic. The study assessed the online teaching competencies possessed by faculty members in NER in teaching agricultural undergraduates. It is encouraging to find most of the faculty members were found to have medium level of competency in online teaching. However, generalisation of the results for the entire North-Eastern region would be faulty because response percentage was low and most of the respondents were younger faculty members. Responses from the older faculty members were limited. Moreover, the respondents' competency level was based on self-evaluation and hence may not accurately reflect actual competency. However, it can be recommended that providing organizational facilities and support in the form of adequate infrastructure and conducting trainings on awareness and usage of e-teaching resources and tools will enhance the online teaching competency of the faculty members.

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