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Motivation as determinant of communication training needs in higher agricultural education: Role of academic and achievement motivation

¹Yogesh BM, ²Girijesh Singh Mahra, ¹Ananda KR, ³Kishan K, ¹Chinnaiah R, ¹Parjanya Pavan, ³Sreenanda S Anand and ¹Mohammed Abdul Razack E

¹Ph.D. Scholar, Division of Agricultural Extension, ICAR-Indian Agricultural Research Institute, New Delhi, India

²Scientist (Senior Scale), Division of Agricultural Extension, ICAR-Indian Agricultural Research Institute, New Delhi, India

³Ph.D. Scholar, Division of Dairy Extension, ICAR-National Dairy Research Institute, Karnal, Haryana, India

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Corresponding Author: Yogesh BM

Abstract

Effective communication is central to professional competence in agricultural education, yet postgraduate students often experience persistent communication skill gaps that may hinder their ability to disseminate research findings and engage with diverse stakeholders. This study examines the relationship between motivational orientation and perceived communication skill gaps among postgraduate students in higher agricultural education in India. The research is motivated by the continued presence of communication deficiencies among agricultural graduates and the recognition of motivation as an important socio-emotional factor influencing effective communication and professional development. The study employed the Motivation Measurement Scale (MMS) developed by Smith (2017) and the Achievement Motivation Scale (AMS) developed by Reddy (1979) to measure academic and achievement motivation among postgraduate agricultural students and to examine their association with self-reported communication skill gaps. Data were collected from 210 postgraduate students drawn from three leading agricultural universities—IARI, GBPUAT, and IAS-BHU. Communication training needs were assessed using the Training Need Index (TNI). The findings revealed that 36.67% of students reported low achievement motivation, while 21.43% exhibited low academic motivation. Writing (skill gap = 32.74%) and speaking (skill gap = 31.95%) emerged as the most critical communication training areas. Correlation analysis indicated significant negative associations between motivation and communication training needs, with academic motivation ($r = -0.213$) and achievement motivation ($r = -0.264$) linked to lower perceived skill gaps. Regression results further showed that academic motivation ($\beta = -0.671$) and achievement motivation ($\beta = -0.575$) were significantly associated with reduced communication training needs. The study highlights the importance of integrating communication skill development with motivation-enhancing strategies to strengthen the professional competence of agricultural graduates. It recommends integrating motivation-building strategies—such as mentoring, feedback, and goal-setting—into communication training programs to prepare achievement-oriented graduates for research, extension, and policy engagement.

Keywords: Academic motivation, achievement motivation, agricultural education, communication skills, training needs

Introduction

Clear and effective communication forms the foundation of professional competence in agricultural education, where graduates are expected to engage in research, extension, policy advocacy, and industry collaboration (Navani *et al.*, 2015) [12]. Agricultural professionals frequently interact with diverse stakeholders, including farmers, researchers, policymakers, and industry representatives, making the ability to communicate complex scientific information clearly and effectively an essential skill. However, despite its importance, several studies have reported persistent communication skill gaps among agricultural graduates, particularly in writing, speaking, and scientific communication (Yadav & Kumar, 2019) [25]. These deficiencies can hinder students' ability to disseminate research findings, build professional networks, and contribute effectively to the agricultural innovation system. Consequently, understanding the factors that influence communication skill development among agricultural

students has become an important area of inquiry.

Previous research suggests that communication skill gaps in higher education are shaped not only by pedagogical approaches but also by psychological and motivational factors that influence students' engagement with learning activities (Rogers & Svenning, 1969; Schunk *et al.*, 2014) [16, 19]. Among these factors, motivation plays a central role in determining how actively students participate in academic tasks, practice communication competencies, and pursue self-improvement. Motivated learners are more likely to engage in activities such as academic writing, presentations, discussions, and collaborative learning, which directly contribute to the development of communication skills. Conversely, students with lower levels of motivation may show limited engagement in these activities, potentially resulting in communication skill gaps that require structured training interventions.

The role of motivation in learning and skill development can be explained through established theoretical perspectives in

educational psychology. In particular, Self-Determination Theory (SDT) and Achievement Motivation Theory provide a useful conceptual basis for understanding how motivational processes influence communication skill development in higher education contexts. Self-Determination Theory, proposed by Deci and Ryan (2000)^[3], explains that human behavior is driven by intrinsic and extrinsic motivational processes that influence individuals' engagement with learning activities. Students with higher levels of intrinsic motivation tend to demonstrate greater curiosity, persistence, and self-regulated learning behaviors. Such students are therefore more likely to actively participate in academic activities—including presentations, discussions, scientific writing, and collaborative learning—which are essential for developing communication competencies.

Complementing this perspective, Achievement Motivation Theory emphasizes individuals' desire to attain success and demonstrate competence in performance-oriented contexts (McClelland, 1961)^[9]. Achievement-oriented students typically set higher goals, actively seek feedback, and strive for continuous improvement in their academic performance. Within higher education environments, this drive for achievement encourages students to refine essential professional skills such as scientific writing, research presentation, and interpersonal communication. Consequently, students with stronger achievement motivation may demonstrate greater initiative in practicing and improving communication skills, thereby reducing potential skill gaps.

In the context of higher agricultural education, communication competencies are particularly important because graduates are expected to disseminate research findings, interact with farming communities, collaborate with interdisciplinary teams, and contribute to policy dialogue. Motivated students are therefore more likely to engage in activities that strengthen these competencies, including academic writing, public speaking, critical reading, and professional communication. These motivational processes can ultimately influence the extent to which students perceive gaps in their communication abilities and their need for additional training.

Despite the recognized importance of communication skills in agricultural education, existing studies have primarily focused on identifying employability skill gaps or evaluating communication competencies among agricultural graduates (Navani *et al.*, 2015; Yadav & Kumar, 2019)^[12, 25]. While these studies provide valuable insights into the nature of communication deficiencies, they largely emphasize skill assessment without adequately examining the underlying psychological determinants that influence skill development. In particular, the role of motivational orientations in shaping communication competencies among postgraduate agricultural students remains relatively underexplored.

Motivation has been widely studied in educational psychology as a key driver of learning engagement, persistence, and academic performance (Deci & Ryan, 2000; Schunk *et al.*, 2014)^[3, 19]. However, limited research has systematically investigated how motivational construct affect students' perceived communication skill gaps and training requirements in higher agricultural education.

Understanding this relationship is particularly important because motivated learners are more likely to engage in communication-intensive academic activities such as research presentations, academic writing, and collaborative discussions, which contribute to skill development.

Furthermore, most previous studies have assessed communication competencies using general self-evaluation or employability frameworks, with relatively few studies applying structured quantitative measures to estimate communication skill gaps. Integrating motivational constructs with a systematic assessment of communication training needs can therefore provide deeper insights into how psychological factors influence professional skill development among agricultural students.

Academic motivation and achievement motivation represent two important dimensions of motivation relevant to higher education. Academic motivation refers to students' intrinsic and extrinsic drive to engage in learning tasks, persist in academic activities, and regulate their learning behaviours (Deci & Ryan, 2000; Schunk *et al.*, 2014)^[3, 19]. Achievement motivation, on the other hand, reflects an individual's orientation toward excellence and success in performance contexts (McClelland, 1987; Reddy, 1979)^[10, 15]. Both forms of motivation play a crucial role in shaping students' learning behaviours and their willingness to develop professional competencies.

To operationalize these constructs, the study employed the Motivation Measurement Scale (MMS) developed by Smith (2017)^[21] to assess academic motivation and the Achievement Motivation Scale (AMS) developed by Reddy (1979)^[15] to measure achievement motivation among postgraduate agricultural students. These instruments were selected due to their suitability for higher education contexts and their ability to capture motivation related to learning engagement and performance orientation. A detailed justification for the selection of these scales in comparison with other established motivation measures is provided in the Materials and Methods section.

In this context, the present study seeks to examine the relationship between academic motivation, achievement motivation, and perceived communication skill gaps among postgraduate students in agricultural universities. By combining motivational assessment with a Training Need Index-based analysis of communication competencies across multiple skill dimensions, the study aims to provide insights into the psychological factors influencing communication skill development in higher agricultural education.

Objectives of the Study

1. To assess the levels of academic motivation and achievement motivation among postgraduate agricultural students.
2. To identify the communication skill gaps and training needs across key communication competencies among postgraduate agricultural students.
3. To examine the relationship between motivational constructs and perceived communication skill gaps.

Materials and Methods

An *exploratory* and *descriptive* research design was employed for this study. Three leading agricultural

institutions were purposively selected based on their ranking and reputation in the National Institutional Ranking Framework (NIRF) 2024. The selection considered specific indicators under NIRF parameters with varying weights: Research and Professional Practice, Graduation Outcomes, Outreach and Inclusivity, and Perception. The chosen institutions reflect a diverse institutional profile, comprising a Deemed University (Indian Agricultural Research Institute, IARI), a State Agricultural University (G.B. Pant University of Agriculture and Technology, GBPUAT), and a Central University with an agricultural faculty (Banaras Hindu University, BHU). All three universities were ranked among the top ten, this rigorous selection process ensures that the research findings are relevant to and representative of high-performing institutions that play a significant role in shaping agricultural education in India. The study targeted postgraduate students enrolled in agricultural programs across the selected institutions. Inclusion criteria required that respondents be currently registered in a master's or doctoral program, with exposure to coursework, seminars, and academic writing, ensuring familiarity with communication-related tasks. To ensure representation from diverse institutional settings, seventy students each from three universities were selected through stratified sampling adding a total of 210 students. Care was taken to include students across different disciplines within agriculture, thereby enhancing the generalizability of findings within the postgraduate agricultural education context.

Rogers and Svenning in their 1969 study described motivation as a particular value that highlights a strong desire for excellence, enabling an individual to attain a sense of professional achievement. In an academic context, motivation is operationally defined as the extent of the students' desire to engage in academically focused behavior. Several established instruments exist for measuring academic and achievement motivation in educational research. For instance, the Academic Motivation Scale (AMS) developed by Vallerand *et al.* (1992) ^[24] is widely used to assess intrinsic and extrinsic motivation based on Self-Determination Theory. Similarly, the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich and De Groot (1990) ^[14] measures motivation along with learning strategies and self-regulation processes. In the domain of achievement motivation, instruments such as the Achievement Motivation Inventory (AMI) (Schuler *et al.*, 2004) ^[18] and McClelland's n-Ach test provide comprehensive measures of achievement orientation.

However, many of these instruments are relatively lengthy and designed for broader psychological or organizational research contexts. For example, the MSLQ consists of approximately 80 items and assesses multiple dimensions beyond motivation, while the AMI includes numerous subscales requiring extensive administration time. Similarly, projective techniques such as McClelland's n-Ach test require specialized training for administration and interpretation, making them less suitable for large-scale classroom surveys.

Considering the practical requirements of this study—particularly the need to administer instruments to a large sample of postgraduate students within a classroom survey setting—shorter and context-appropriate scales were preferred. The Motivation Measurement Scale (MMS)

developed by Smith (2017) ^[21] provides a concise measure of academic motivation focused on goal orientation and persistence in learning tasks, making it suitable for higher education research. Likewise, the Achievement Motivation Scale (AMS) developed by Reddy (1979) ^[15] has been widely used in Indian educational contexts and offers a culturally relevant and reliable measure of students' achievement orientation. The use of these two instruments therefore enabled a focused assessment of motivational orientations most relevant to communication skill development while maintaining feasibility for large-scale quantitative data collection.

The motivation measurement scale developed by John Smith (2017) ^[22], was used in this study to assess the academic motivation of the students. The scale includes twenty clear statements, and respondents were instructed to mark the appropriate score for each statement based on their self-evaluation and judgment. A score between 1 and 3 for any statement indicates low motivation (very demotivating) for that particular statement. A score between 4 and 7 reflects average motivation, with a score of 4 signifying a 'slightly motivating' attitude, and scores of 5 and 6 representing a 'neutral' stance on academic motivation for that statement. A score of 7 also indicates a 'slightly motivating' nature. Scores between 8 and 10 suggest high motivation (very motivating) for the corresponding statement.

Reddy in his 1979 study defines Achievement Motivation as personality orientation of the respondents that drives them to pursue excellence. Data was gathered from students using the achievement motivation scale developed in his study, which includes seven statements. Respondents were asked to rate their agreement with these statements on a five-point scale, ranging from strongly agree to strongly disagree. The highest possible score for each respondent was 35, while the lowest was 7. After analyzing the data, on the basis of Cumulative Square Root Frequency (CSRF), both Academic and Achievement motivation of the students was further categorized into 3 different categories

To ensure the internal consistency of the instruments used in the study, reliability analysis was conducted using Cronbach's alpha. The Motivation Measurement Scale (MMS) showed good internal consistency (Cronbach's $\alpha = 0.84$), while the Achievement Motivation Scale (AMS) demonstrated acceptable reliability (Cronbach's $\alpha = 0.78$), indicating that both scales were suitable for measuring motivational constructs in the present sample of postgraduate agricultural students.

Required Communication skills for students were gathered with using Delphi technique among five dimensions *viz*, speaking, writing, reading, listening and non-verbal skills, perceived competency in these Communication skills was gathered with the help of five-point scale. The Training Need Index (TNI) for communication skills is computed with the help of following formula (Patil and Kokate, 2011). Training need index is calculated by dividing Total obtained score by maximum obtainable score, and by multiplying with 100,

$$TNI = \frac{\text{Total obtained score}}{\text{Maximum obtainable score}} \times 100 \quad \text{-(I)}$$

$$\text{Skill gap} = \text{Training need} = 100 - TNI \quad \text{-(II)}$$

The communication competencies assessed in this study are based on students' self-perceived levels of competence and importance of specific communication skills. The Training Need Index therefore reflects perceived communication training needs rather than objectively measured communication proficiency. Perception-based assessment is widely used in training need analysis because it captures learners' subjective evaluation of their own skill gaps and

identifies areas where they feel additional training or support is required. However, such assessments may also be influenced by individual self-evaluation tendencies. Therefore, the findings should be interpreted as indicators of perceived communication skill gaps among postgraduate students.

Major findings

Table 1: Distribution of students' according to achievement motivation

S. N.	Achievement Motivation	Category	IARI (n=70)		GBPUAT (n=70)		BHU (n=70)		Total Students (n=210)	
			f	%	f	%	f	%	f	%
1	Low	<21.23	24	34.29	26	37.14	27	38.57	77	36.67
2	Medium	21.23-27.08	27	38.57	27	38.57	21	30.00	75	35.71
3	High	>27.08	19	27.14	17	24.29	22	31.43	58	27.62

Table 1 reflects achievement motivation, among total students 27.62 per cent of students shows high degree of motivation which was comparatively lower to 36.67 per cent and 35.71 per cent students belonging to low and medium category of respectively, indicating that while a notable portion demonstrates adequate drive, a significant number remain less motivated. Institution-wise, IARI and GBPUAT

had more students in the low and medium categories, whereas BHU showed a relatively higher proportion (31.43%) with high motivation. These results suggest a need for targeted strategies, such as mentorship and goal-setting interventions, to enhance achievement motivation and academic engagement among students (Schunk *et al.*, 2014; Vallerand, 1997) ^[19, 23].

Table 2: Distribution of students' according to academic motivation

S.N.	Academic Motivation	Category	IARI(n=70)		GBPUAT(n=70)		BHU(n=70)		Total Students (n=210)	
			f	%	f	%	f	%	f	%
1	Low	<105.30	16	22.86	14	20	15	21.43	45	21.43
2	Medium	105.30-149.95	26	37.14	32	45.72	28	40	86	40.95
3	High	>149.95	28	40	24	34.28	27	38.57	79	37.62

Table 2 depicts academic motivation, among total students 21.43 per cent of students belongs to low category of motivation which was comparatively lower to 37.61 per cent and 40.95 per cent students belonging to low and medium category respectively, suggesting that most students demonstrate moderate to strong engagement in academic pursuits, but still significant number of students have low degree of motivation. At the institutional level, IARI and BHU had a slightly higher proportion of highly motivated students, whereas GBPUAT had more in the medium category, reflecting a fairly balanced distribution overall,

with a slightly stronger inclination toward higher motivation at IARI and BHU. These results are consistent with Vallerand *et al.* (1992) ^[24] and Ryan & Deci (2000) ^[17], who emphasize the role of intrinsic and extrinsic motivation in academic engagement and performance. The findings suggest that, although the majority are motivated, interventions such as mentoring, goal-setting, and active learning could further enhance students' academic motivation and outcomes (Schunk *et al.*, 2014; Pintrich & De Groot, 1990) ^[19, 14].

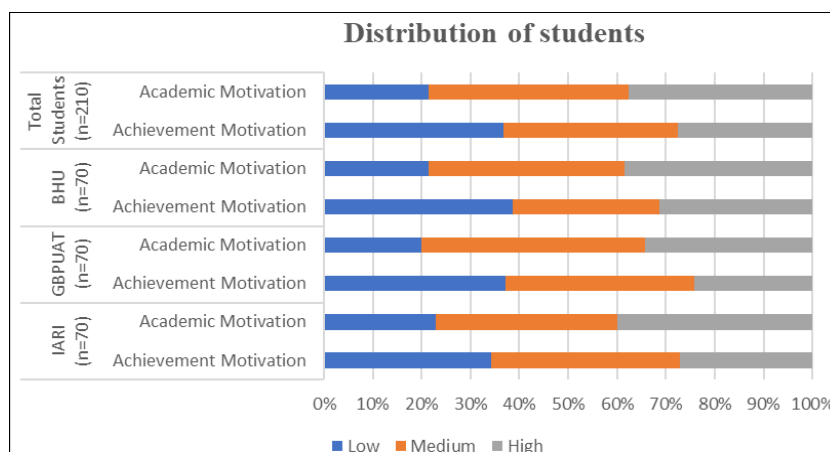


Fig 1: Distribution of students among the institutes

Table 3: Freidman test for Motivation

Indicators	Universities	Mean rank	Chi-square	Sig.
Academic Motivation	GBPUAT	1.90	1.229	0.451
	IARI	2.01		
	BHU	2.09		
Achievement Motivation	GBPUAT	1.94	0.792	0.693
	IARI	2.08		
	BHU	1.99		

Table 3 illustrates the mean rank and chi-square scores of academic and achievement motivation across GBPUAT, IARI, and BHU showed no statistically significant differences, these findings suggest that institutional affiliation does not substantially influence motivation

Table 4: Communication skills dimensions Results of TNI

Indicators	Score	GBPUATNI%	IARI TNI%	BHU TNI%	Over All TNI%	Skill gap/ Training need	Rank
Speaking skills	7860 (11 skills)	63.12	72.55	72.31	68.05	31.95	2
Writing skills	11299 (16 skills)	63.09	71.51	72.60	67.26	32.74	1
Listening skills	13102 (18 skills)	63.25	68.95	69.57	69.32	30.68	4
Reading skills	7159 (10 skills)	66.40	69.19	72.38	68.18	31.82	3
Non-verbal skills	8735 (12 skills)	63.46	69.57	71.51	69.33	30.67	5
Overall communication skills	48272 (67 skills)				68.62	31.38	

The table 4 highlights lowest TNI values for Writing and speaking skills indicate these areas require the most immediate training to enhance overall communication skills. Writing skills emerged as the most critical area requiring intervention. Postgraduate students often struggle with academic writing, scientific communication, and technical documentation, which are vital for publishing research, preparing extension reports, and drafting grant proposals (Flowerdew, 2015; Hyland, 2019) ^[5, 7]. Research indicates that structured writing interventions—such as peer review, writing workshops, and guided feedback—can substantially improve academic writing proficiency (Graham & Perin, 2007) ^[6]. Speaking skills were identified as the second most critical training need, underscoring the importance of improving verbal communication for academic presentations, professional interactions, and extension work. According to Segrin and Flora (2019) ^[20], effective public speaking is vital for career development, and they advocate using interactive approaches such as mock presentations and group discussions to strengthen these skills. Reading and listening skills are fundamental for academic understanding and professional development. Strong reading skills enable students to analyze research articles, interpret policies, and make evidence-based decisions (Lundberg & Linnakyla, 1993) ^[8], while active listening promotes knowledge retention, collaboration, and effective communication in research and extension contexts (Brown *et al.*, 2014) ^[2]. Training programs incorporating reading strategies (e.g., skimming, critical analysis) and listening exercises can enhance these competencies significantly. Although non-verbal communication had the lowest training need score, it remains an essential aspect of interpersonal interaction. Mehrabian (2017) ^[11] highlights the importance of body language, eye contact, and gestures, especially in multicultural and extension settings. Overall, these findings are consistent with previous studies on communication training needs in higher education. Segrin and Flora (2019) ^[20] stress the importance of verbal

among postgraduate agricultural students, aligning with prior research emphasizing that motivation is largely influenced by individual factors such as personal goals, self-efficacy, and intrinsic interest rather than institutional context (Reddy, 1979; Vallerand *et al.*, 1992) ^[15, 24]. Schunk *et al.* (2014) ^[19] also note that while educational environments can provide supportive structures, motivation primarily stems from internal drives and goal-directed behaviors. The similarity in motivation levels across IARI, GBPUAT, and BHU indicates a relatively homogeneous student cohort in terms of academic engagement and achievement orientation, which could facilitate generalizable interventions aimed at enhancing motivation and communication skills in agricultural education.

communication for professional advancement, while Brown *et al.* (2014) ^[2] highlight foundational listening and reading skills for improved learning outcomes. The results suggest that agricultural universities should design a comprehensive communication training program prioritizing writing and speaking skills, followed by reading, listening, and non-verbal communication.

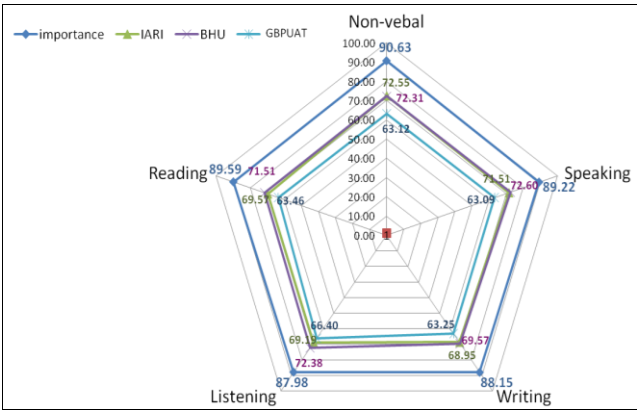


Fig 2: TNI values depicting skill gaps among institutes

Figure 2, illustrates a notable gap between the maximum attainable TNI score (100%) and the perceived importance levels of all five communication skill dimensions: speaking (89.22%), writing (88.15%), listening (87.98%), reading (89.59%), and non-verbal skills (90.63%). The figure also highlights a significant discrepancy between students' perceived performance and the importance level across all universities. Notably, students from IARI and BHU reported nearly similar and comparatively higher perceived performance in all five communication skill dimensions than students from GBPUAT. The Spearman correlation results indicate that both academic motivation ($r = -0.213, p < 0.01$) and achievement motivation ($r = -0.264, p < 0.01$) are significantly and

negatively correlated with communication training needs. This suggests that students who are more motivated academically and in terms of achievement tend to perceive fewer gaps in their communication skills, that implies higher motivation levels are associated with stronger self-directed learning, persistence, and willingness to improve, which reduce the need for external training interventions.

The regression analysis further supports this relationship. Academic motivation ($\beta = -0.671$, $p < 0.05$) and achievement motivation ($\beta = -0.575$, $p < 0.01$) both showed significant negative contributions to communication skill gaps. This implies that for every one-unit increase in academic and achievement motivation, the perceived communication skill gap decreases by 0.671 and 0.575 units, respectively. The results highlight that students with higher motivation levels tend to report fewer communication skill gaps, reinforcing the idea that motivated students are more proactive in practicing, refining, and applying communication-related academic activities such as presentations, discussions, and scientific writing, which can contribute to the development of communication and professional competencies.

These findings are consistent with existing literature. Schunk *et al.* (2014)^[19] and Pintrich & De Groot (1990)^[14] emphasized that motivated learners are more likely to adopt effective learning strategies, engage in practice, and

overcome skill deficits. Similarly, Ryan and Deci's (2000)^[17] Self-Determination Theory suggests that intrinsic and achievement-oriented motivation fosters competence development, including communication abilities. The significant negative relationship in this study therefore underlines the importance of enhancing students' motivation as part of communication training programs in agricultural universities. Tailored interventions that integrate motivation-building strategies—such as goal-setting, feedback, and recognition—could be particularly effective in narrowing communication skill gaps.

The multiple linear regression analysis provides further insights into the factors that contribute to communication skill gaps. The adjusted R-square value 0.75 suggests that the independent variables collectively explain a substantial portion of the variance in communication skills needs. The significant negative contribution of variables such as academic performance, mother's education, empathy, self-esteem, and self-confidence along with Academic and Achievement motivation supports the notion that students with higher levels of these traits experience fewer communication skill deficits. Navani *et al.* (2015)^[12] reported that 80 per cent of employers required agricultural graduates to have excellent interpersonal, reading, comprehension, and listening skills. Critical thinking and empathy were deemed essential by almost all respondents.

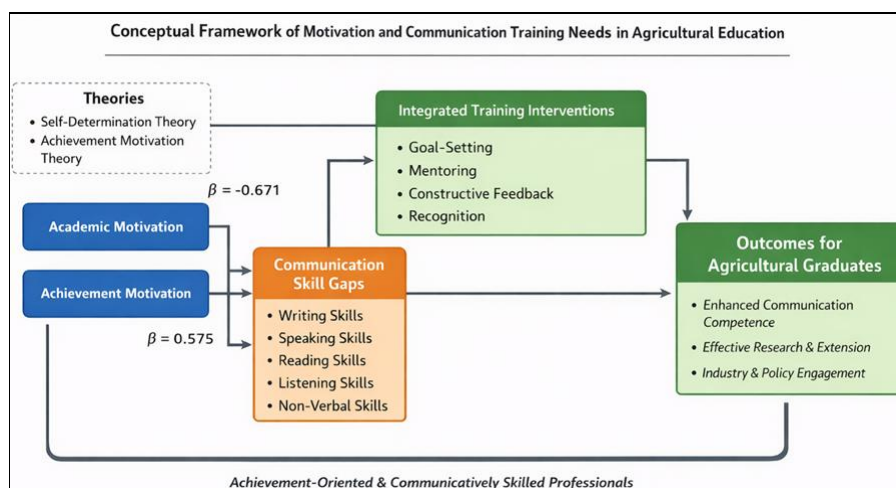


Fig 3: conceptual framework

Discussion

The findings of the study highlight the important role of motivation in shaping communication training needs among postgraduate agricultural students. A considerable proportion of students exhibited low to moderate levels of achievement motivation and academic motivation, suggesting that motivational orientation may influence the extent to which students engage in communication-related academic activities. Motivation has long been recognized as a key determinant of learning engagement and skill development in higher education (Schunk *et al.*, 2014)^[19]. Students who possess stronger motivational orientation are more likely to participate actively in learning tasks, seek feedback, and invest effort in developing professional competencies.

Among the different communication competencies assessed, the prominence of writing and speaking skill gaps observed

in reflect the increasing importance of scientific communication in postgraduate agricultural education. Postgraduate students are required to prepare research proposals, scientific manuscripts, and thesis documents, which demand strong academic writing abilities. Similarly, oral communication skills are essential for seminar presentations, conference participation, and extension outreach activities. Previous research has also identified deficiencies in scientific writing and presentation skills among agricultural graduates, suggesting that communication training remains an important component of professional development in agricultural education (Navani *et al.*, 2015; Yadav & Kumar, 2019)^[12, 25].

The negative association observed between motivation and communication skill gaps suggests that students with higher levels of academic and achievement motivation tend to report fewer perceived communication deficiencies. This

finding aligns with Self-Determination Theory, which emphasizes that intrinsically motivated learners demonstrate greater persistence, self-regulation, and engagement in academic tasks (Deci & Ryan, 2000) ^[3]. Students who are motivated to achieve academic success may actively seek opportunities to improve their communication abilities through presentations, academic writing, and collaborative learning activities. Similarly, Achievement Motivation Theory suggests that individuals with strong achievement orientation tend to set higher goals and continuously strive for performance improvement (McClelland, 1961) ^[9]. Such motivational tendencies may encourage students to practice and refine communication skills, thereby reducing perceived training needs.

The absence of significant differences in motivation levels across the three universities suggests that motivational orientations among postgraduate agricultural students may be influenced more by individual characteristics than by institutional factors. Previous studies have also indicated that personal attributes such as goal orientation, self-efficacy, and intrinsic interest play a stronger role in shaping motivation than institutional context alone (Schunk *et al.*, 2014) ^[19]. This finding implies that communication training interventions designed to enhance motivation could potentially be applied across different agricultural universities.

The institutions represent different organizational structures, including a deemed university, a state agricultural university, and a central university with an agricultural faculty. These institutions differ in terms of academic culture, research orientation, and exposure to communication-related academic activities. However, postgraduate agricultural programs typically share common academic requirements such as thesis writing, seminar presentations, and research dissemination activities. These shared expectations may contribute to relatively similar motivational orientations among students across institutions. Nevertheless, institutional environments can influence the availability of structured opportunities for communication practice, such as seminar systems, writing support programs, and extension engagement activities (Boyle, 2012) ^[1].

From a practical perspective, the results highlight the importance of integrating communication skill development with motivation-enhancing strategies in agricultural education. Traditional communication training programs often focus primarily on technical skill development, such as writing workshops or presentation training. However, the findings of this study suggest that motivational factors may also influence students' willingness to engage with such training. Therefore, educational institutions may benefit from adopting holistic approaches that combine communication skill development with strategies aimed at strengthening students' motivation, such as mentoring, goal-setting exercises, feedback mechanisms, and collaborative learning opportunities.

Overall, the study contributes to the growing body of literature emphasizing the role of psychological factors in professional skill development. By linking motivational constructs with communication training needs, the findings provide insights that may help agricultural universities design more effective training programs for postgraduate

students. Strengthening both motivation and communication competencies can enhance the professional preparedness of agricultural graduates and improve their ability to effectively engage with research, extension, and policy processes.

Practical implications for agricultural education

The findings highlight important implications for communication training in higher agricultural education. Since writing and speaking skills emerged as the most prominent communication training needs, agricultural universities should prioritize structured opportunities to develop these competencies through initiatives such as scientific writing workshops, research presentation seminars, and communication-focused coursework within postgraduate curricula.

The observed relationship between motivation and communication skill gaps also suggests that communication training may be more effective when combined with strategies that enhance students' motivation and engagement. Mentorship programs, goal-setting exercises, peer-learning activities, and constructive feedback mechanisms can encourage students to actively practice communication skills and build confidence in academic interactions. Experiential learning approaches, including student-led seminars and extension communication simulations, can further provide opportunities for applying communication skills in realistic academic and professional contexts.

At the policy level, curriculum planners and agricultural education authorities may consider integrating structured communication competency frameworks within postgraduate training programs to strengthen the professional preparedness of agricultural graduates and improve research dissemination and extension communication (Boyle, 2012) ^[1]. Future research may incorporate objective assessments of communication competencies and longitudinal approaches to better understand how motivation and communication skills evolve during postgraduate training.

Limitations

The study relies on self-reported assessments of communication competencies, which reflect students' perceived skill levels rather than objective communication performance. Self-perception measures may be influenced by factors such as over- or under-estimation of one's abilities and social desirability bias. Consequently, the Training Need Index calculated in this study represents perceived communication training needs among students. However, given the cross-sectional nature of the study, the results should be interpreted as indicating associations rather than causal relationships between motivational orientations and perceived communication skill gaps. Future research may complement perception-based assessments with objective measures of communication performance, such as evaluation of presentation skills, scientific writing assessments, or instructor-based communication competency ratings.

Conclusion

The present study highlights the important role of academic

motivation and achievement motivation in shaping communication training needs among postgraduate students in higher agricultural education. The findings indicate that a considerable proportion of students exhibit low to moderate levels of motivation, which may influence the presence of communication skill gaps, particularly in writing and speaking competencies. The Training Need Index analysis revealed that these two domains represent the most prominent training needs, reflecting their critical importance in research dissemination, extension communication, and professional engagement.

The correlation and regression analyses further indicate a significant negative association between motivational orientation and perceived communication training needs. Students with higher levels of academic and achievement motivation tend to report fewer communication skill gaps, suggesting that motivated learners may be more self-directed, persistent, and proactive in refining their communication abilities. These findings emphasize that motivation functions not only as an internal driver of learning but also as an important factor associated with the development of professional competencies among agricultural graduates.

The study therefore underscores the need for agricultural universities to adopt holistic training approaches that integrate communication skill development with motivation-enhancing strategies. Initiatives such as goal-setting exercises, mentoring programs, constructive feedback mechanisms, and recognition-based learning environments can strengthen students' motivation while simultaneously improving their communication competencies. Strengthening both motivation and communication skills can enhance the ability of postgraduate students to effectively disseminate research findings, engage with farming communities, and contribute to extension, policy dialogue, and industry collaboration.

Overall, integrating motivational support with structured communication training can help develop achievement-oriented and communicatively competent agricultural professionals capable of addressing the complex challenges facing the agricultural sector and supporting the broader agricultural innovation system.

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