P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 7; July 2025; Page No. 183-187

Received: 04-05-2025
Accepted: 08-06-2025

Indexed Journal
Peer Reviewed Journal

Investigation of the predictive relationship between core competency factors of extension professionals

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DOI: https://www.doi.org/10.33545/26180723.2025.v8.i7c.2124

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Abstract

For the study, 120 extension professionals who had completed their post-graduation studies in agriculture and veterinary extension were randomly chosen as a sample. In order to assess the core competencies, i.e., the abilities in "communication," "leadership," "diversity and multiculturalism," "programme evaluation and research," "management," and "professionalism" a core competency measurement scale was developed. Expert opinion ratings were used to validate the scale. The core competency level of extension professionals was measured by mean score analysis. Using a "t test," the impact of the control variables (type of gender and kind of post-graduation program) was studied. The predictive relationship between the core competency factors was determined using a Pearson correlation matrix. To calculate the consistency and ascertain the proposed relationship between the core competency factors, PLS-SEM was employed. The extension professionals had the highest perceived competencies in the areas of 'leadership', 'professionalism', 'diversity and multiculturalism', and 'communication'. When compared to graduates with master's degrees, those with PhDs in extension showed substantially greater perceived core capabilities. Using the One a path analysis was done to estimate the strength of the proposed association between the competency factors. 'Leadership' and 'Professionalism' accounted for 85.6% of the variation in 'Management Skills'. 'Communication' and 'professionalism' abilities accounted for 68 percent of the variance in 'leadership skills'. The explanation of 'communication skills' alone accounted for 78.9 percent of the variation in 'professionalism'. Having one core competency skill, therefore, had a significant impact on the other skills.

Keywords: Core competency, extension, skills, path analysis

Introduction

The veterinary and agricultural extension service system's greatest advantage is its pool of knowledgeable extension specialists. Extension professionals must be proficient in both their area of expertise and the process of providing agriculture extension services due to the following factors: rapidly changing sociodemographic, evolving science and technologies, a diverse and dynamic agricultural system, growing competition for resources, and an increasingly globalized world (Cochran *et al*., 2012) [3]. By its very nature, the Agriculture Extension System ought to be pluralistic, demand-driven, and participatory (Rivera *et al*., 2009) [14]. Extension specialists need to be skilled and informed, able to assess the situation and build strong relationships with their clients. They also need to exhibit professionalism and possess a mastery of specialized information (Zwane, 2014) [19]. Furthermore, Hoffman (2014) notes that extension has benefited greatly from the efforts of extension workers who are able to make well-informed judgments and who have developed adaptability skills. According to Sulaiman and Davis (2012) [18], providing high-quality extension services requires that extension workers collaborate and work together more effectively. Additionally, extension professionals' knowledge, skills, and capacities need to be updated on a regular basis with the appropriate training (Mulder, 2014) [11]. Extension specialists should be proficient in both practical and process skills, or soft skills (Moore, 2015) [10].

It is a widely held belief that someone who possesses exceptional expertise in a particular field ought to be appointed as a leader in that field. Lawyer (2018) [8], however, in one of his study on leadership styles found that a person's leadership abilities are mostly independent of their subject-matter competence. The operation of the extension system is further hampered by low partnerships, insufficient staff, and a top-down, linear focus on extension (Babu *et al*., 2013) [1]. Activities related to agriculture and rural development must involve non-public sectors such as

input agencies, farmer organizations and cooperatives, non-governmental organizations (NGOs), financial institutions providing rural credit services, informal leaders such as progressive farmers, and local leaders. i.e., an approach that is pluralistic is required for extension (Sajesh *et al*., 2018) [17]. The goal of the current study was to gauge the graduates of extension programs' degree of competency. In general, key competencies interact and impact one another. Thus, using path analysis, an attempt was made to ascertain the proposed link between the key competency components.

Materials and Methods

For the study, 120 extension professionals who had completed post-graduation in veterinary and/or agricultural extension were selected randomly. The core competency skills in "communication," "leadership," "diversity and multiculturalism," "management," "professionalism," and "programme evaluation and research" were measured using a core competency measurement scale that was developed. Ratings from experts' opinions were used to verify the scale. To find the core competency level of extension professionals, mean score analysis was performed. Gender and type of post-graduation program were employed as control variables, and the "t test" was utilized to analyse their effects. The relationship between the core competency factors was ascertained using a Pearson correlation matrix. The predicted association between the core competency components was ascertained and the consistency was estimated using PLS-SEM. scores for dependability.

Results and Discussion

The extension graduates' highest rated competencies were in "communication skills" (M = 4.11), "leadership skills" (M = 4.08), "diversity and multiculturalism skills" (M = 4.29), and "professionalism skills" (M = 4.33). The two factors, "Management skills" (M = 3.89) and "Program Evaluation and Research skills" (M = 3.85) had comparatively lower results.

Table 1: Perceived Core Competency Scores of Extension Professionals

#	Core Competencies	Mean Score (Z)
1	Professionalism Skills	4.33
2	Diversity and Multiculturalism Skills	4.29
3	Leadership Skills	4.08
4	Communication Skills	4.11
5	Program Evaluation and Research Skills	3.85
6	Management Skills	3.89

When gender and type of post-graduation program were taken into account, the results revealed some intriguing trends (Table 2&3). When compared to graduates with master's degrees, those with PhDs in extension showed substantially greater perceived core capabilities.

Table 2: Core Competency Scores controlled for type of post-graduation

Graduate Competencies	Total (N=120)	Masters (N=68)	PhD (N=52)
Communication Skills	4.11 (.082)	3.79 (.070)	4.54 (.082) ***
Leadership Skills	4.08 (.086)	4.00 (.056)	4.27 (.089) ***
Diversity, Pluralism and Multiculturalism	4.29 (.078)	4.21 (.070)	4.54 (.084) **
Programme Evaluation and Research	3.85 (.092)	3.59 (.086)	4.50 (.085) ***
Management	3.89 (.089)	3.46 (.054)	4.32 (.056) ***
Professionalism	4.33 (.081)	4.00 (.082)	4.77 (.078) ***

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

In comparison to females (M = 4.00), males reported considerably greater perceived abilities in "communication skills" (M = 4.50). In addition, men's management skills were significantly greater (M = 4.50) than women's (M = 3.85). According to a South African study, women extension advisors received little agricultural training, and this posed a significant obstacle to their ability to provide extension services (Raidimi and Kabiti, 2017) [13].

Table 3: Core Competency Scores controlled for gender

Graduate Competencies	Total (N=120)	Male (N=92)	Female (N=28)
Communication Skills	4.11 (.082)	4.50 (.084)	4.00 (.082) **
Leadership Skills	4.08 (.086)	4.15 (.056)	4.00 (.089)
Diversity, Pluralism and Multiculturalism	4.29 (.078)	4.30 (.068)	4.50 (.072)
Programme Evaluation and Research	3.85 (.092)	3.98 (.086)	4.00 (.085)
Management	3.89 (.089)	4.50 (.056)	3.85 (.058) ***
Professionalism	4.33 (.081)	4.50 (.082)	4.28 (.078)

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Measuring the strength and interaction between key competency factors

The core competency factors that demonstrated a positive and substantial link with one another were correlated using correlation analysis (Table 4).

Table 4: Correlation between the core competency factors

	Communication Skills	Diversity Pluralism Multiculturalism	Leadership Skills	Program Evaluation and Research	Management skills
Communication Skills	1				
Diversity, Pluralism and Multiculturalism	0.696***	1			
Leadership Skills	0.553***	0.495***	1		
Program Evaluation and Research	0.605***	0.383**	0.551***	1	
Management skills	0.883***	0.358**	0.532***	0.510***	1
Professionalism	0.711***	0.519***	0.514***	0.387**	0.724***

It was clear from the correlation matrix that there was a strong association between the core competency factors. As a result, having one skill had a big impact on the other. By creating a path diagram using partial least squares structural equation modelling (PLS-SEM) the strength of the proposed association between the competency factors was estimated (Figure 1). In order to achieve model fit, "Program Evaluation and Research," one of the core competency factor, was removed from the path model. Additionally, all of the items with low factor loadings were likewise eliminated (Table 7). To estimate the consistency of the findings, composite reliability was calculated (Table 5).

Table 5: Reliability Scores of Core competency factors

Latent Variable	Composite reliability
Communication Skills	0.832
Leadership Skills	0.718
Professionalism	0.923
Diversity& multiculturalism	0.912
Management	0.834

With a coefficient of determination (R2) of 0.856, the core competency in management, showed that the interaction of leadership skills (r = 0.300) and professionalism skills (r = 0.422) explained 85.6 percent of the variance in management abilities (Table 6). In management, professionalism is essential. A strong internal commitment serves as the best guiding mechanism for professionalism. Management vision depends on a sustainable and fruitful dialogue with efficient leadership and conflict resolution (Romme, 2019) [16]. Managers jeopardize their performance and professional conduct when they disregard and distort their professional ideals in tumultuous and extremely complicated situations (Flyvbjerg, 2006) [4]. In addition to the knowledge component, the idea of professionalism also alludes to social norms on appropriate professional conduct (Romme, 2016) [15]. Higher correlation coefficients between the leadership profiles of external emphasis and quality management principles were found in a 2017 study by Barbosa *et al*. The constant pursuit of excellence is empowered, guided, and supported by great leadership, which also fosters an atmosphere of authenticity, trust, and open communication. (Panda, 2019).

The interaction between professionalism skills (r = 0.336) and communication skills (r = 0.511) significantly explained 68% of the variance in leadership skills, according to the core competency in leadership with a coefficient of determination (R2) of 0.68. Colleagues with strong communication skills are inspired and motivated to put in a lot of effort and accomplish team and organizational goals. Employee motivation and performance would be determined by how consistently strong leadership was provided (Galli, 2021) [5]. Excellent communicators also make for great professionals, and this affects how they lead.

Remarkably, Professionalism's coefficient of determination (R2) of 0.789 showed that communication abilities alone accounted for 78.9% of the variance in Professionalism (r = 0.888). When working with customers, having effective communication skills is crucial for managing a variety of stressors and boosting their sense of professional self-efficacy (Leal-Costa *et al*., 2020) [9].

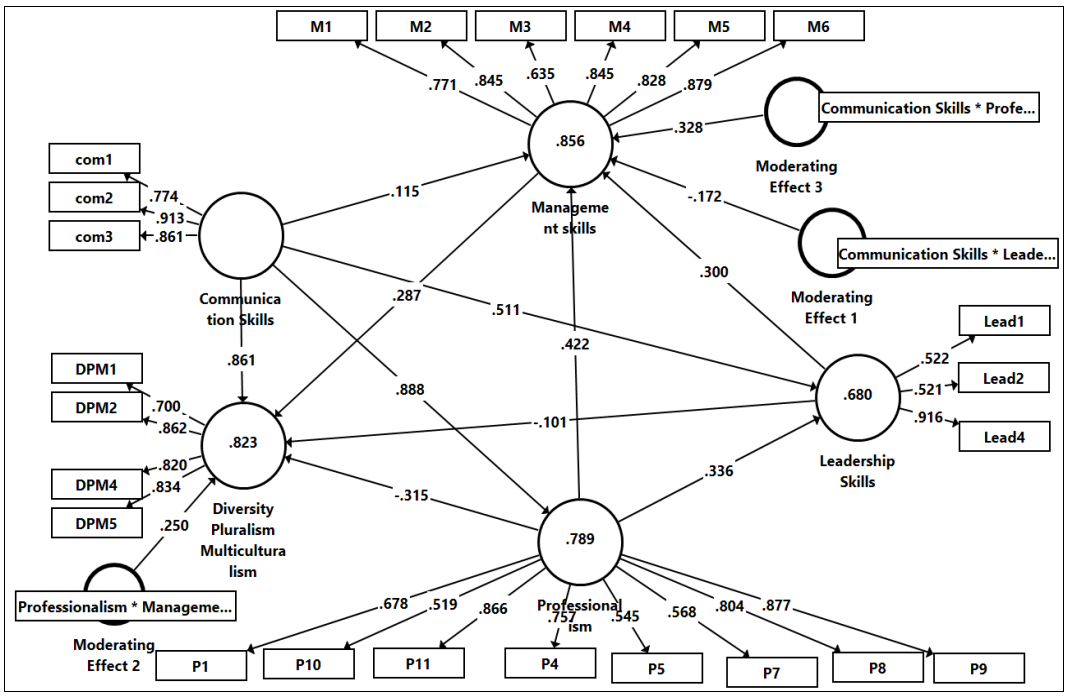
With a coefficient of determination (R2) of 0.823, the interaction of management skills (r = 0.287) and communication skills (r = 0.861) explained 82.3 percent of the variance in Diversity and Multiculturalism skills. It is becoming more and more crucial to have effective communication skills in the ever-changing multicultural workplace. Managing diversity involves more than just accepting individual differences. A communicator's capacity to adjust to quickly shifting tasks and professional connections is vital (Okoro *et al*., 2012) [12]. While professionalism did not have a significant impact on diversity, pluralism, or multiculturalism, it did have a substantial impact when it was mediated by management abilities (r = 0.250).

Table 6: Regression analysis of the elements in the core competency that are hypothesized to be related using path analysis

Dependent Variable	Independent Variable	β	R^2 Value
Diversity and Multiculturalism Skills	Communication Skills	0.861***	0.823
	Professionalism Skills	-0.315	
	Leadership Skills	-0.101	
	Management Skills	0.287**	
	Management*Professionalism Interaction	0.250*	
Leadership Skills	Communication Skills	0.511***	0.680
	Professionalism Skills	0.336**	
Management Skills	Communication Skills	0.115	0.856
	Communication *Professionalism Interaction	0.328	
	Communication *Leadership Interaction	-0.172	
	Professionalism Skills	0.422*	
	Leadership Skills	0.300*	
Professionalism Skills	Communication Skills	0.888***	0.789

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Path diagram illustrating the suggested correlation between the Core Competency Factors



Factors accepted/eliminated during the process of path analysis due to poor factor loading

#	Core Competency Factor Items	Item Code	Accepted/ Eliminated
	Communication Skills		
1	Awareness of various styles of communication and be ability to use them	com1	Accepted
2	Demonstration of good speaking skills with clients	com2	Accepted
3	Demonstration of effective listening skills	com3	Accepted
4	Practicing appropriate communication that suit the needs of clients	com4	Eliminated
5	Awareness of local dialects and cultures while communicating with clients	com5	Eliminated
	Leadership Skills		
6	Positive belief in teamwork and encouraging teamwork in organization	lead1	Accepted
7	Practicing the basic approaches to conflict resolution	lead2	Accepted
8	Positively engaging with the local political forces in community development activities	lead3	Eliminated
9	Practice consensus decision making among clients and stakeholders	lead4	Accepted
10	Effectively delegate tasks to staff members/ subordinates	lead5	Eliminated
	Diversity and Multiculturalism		
11	Demonstrate sensitivity to the diverse needs of various cultural groups in the community	DPM1	Accepted
12	Engage and enhance the participation of various ethnic and socio-cultural groups in extension programs	DPM2	Accepted
13	Ensure that women and farmers from rural areas and marginalized groups participate in the extension programs	DPM3	Eliminated
14	Identify, understand and appreciate the needs of my staff members	DPM4	Accepted
15	Ensure the collaboration with private sector agencies, NGOs, farmer cooperatives, etc. in delivering extension services to the clients.	DPM5	Accepted
	Program evaluation and research		
16	Regularly monitor the extension programs and services	PER1	Eliminated
17	Adopt formative and summative evaluations to address the extension programs	PER2	Eliminated
18	Communicate monitoring and evaluation findings to clients—farmers, researchers, educators, line agencies and departments.	PER3	Eliminated
19	Improve and/or redesign programs based on evaluation results	PER4	Eliminated
20	Remain current with extension-related research findings and research approaches	PER5	Eliminated
	Management		
21	Understand and able to convey information about the vision, mission and goals of the extension services	M1	Accepted
22	Conduct staff appraisal and keep staff members informed of their performance	M2	Accepted
23	Effectively implement reward and punishment systems in my workplace	M3	Accepted
24	Engaged in identifying the needs of my staff and address them	M4	Accepted
25	Organize staff meetings in a timely manner and seek staff input	M5	Accepted
26	Understand and efficiently engage in fiscal management	M6	Accepted
	Professionalism		

27	Demonstrate a strong work ethic	P1	Accepted
28	Commitment to continuous learning and career advancement	P2	Eliminated
29	Positive attitude towards extension work	P3	Eliminated
30	Demonstrate critical thinking and problem-solving skills	P4	Accepted
31	Working independently	P5	Accepted
32	Adhere to deadlines (i.e., accomplish tasks on time)	P6	Eliminated
33	Demonstrate punctuality (i.e., arrive on time for work/meetings)	P7	Accepted
34	Perform job at optimal levels	P8	Accepted
35	Understand the ethical implications of the decisions made	P9	Accepted
36	Open to and respond positively to constructive criticism	P10	Accepted
37	Exhibit a professional appearance (i.e., appropriate attire, physical appearance, personal hygiene)	P11	Accepted

Conclusion

The path analysis and the measurement of core competences across six dimensions showed that each core competency aspect was highly influencing the others. Consequently, it is imperative that academic institutions and instructors foster a free and encouraging learning environment that encourages professional development in extension students, since this enhances their capacity for leadership and communication. All of these elements ought to be emphasized more in university education generally in order to raise extension workers' overall effectiveness and so support the nation's economic expansion.

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