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Utilization pattern of e-extension modules among veterinarians in the south zone of Telangana

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Abstract

The rapid advancement of Information and Communication Technologies (ICTs) has transformed veterinary extension by enabling timely access to scientific information, advisory services and continuous learning through digital platforms. e-Extension modules have emerged as valuable tools for strengthening the competencies of veterinarians and enhancing livestock service delivery. Understanding the utilization pattern of these digital resources is essential for promoting their effective adoption and use in veterinary extension. Therefore, the present study was undertaken to assess the utilization pattern of e-Extension modules among veterinarians in the south zone of Telangana. A post-test only experimental research design was adopted for the study. A total of 123 Veterinary Assistant Surgeons working in the south zone of Telangana were selected through proportionate stratified random sampling. The respondents were exposed to the developed e-Extension modules comprising a mobile application, video modules, a web portal and a digital manual for one month. Data were collected using a structured questionnaire and analysed using frequencies, percentages, weighted mean scores and ranking. The utilization pattern of e-Extension modules was examined through two dimensions, namely handling preferences and utilization. The handling preferences indicated that mobile applications secured the first rank, followed by social media platforms (Rank II), webinars (Rank III), digital manuals (Rank IV), web portals (Rank V), video modules (Rank VI), websites (Rank VII), television (Rank VIII), MOOCs (Rank IX) and expert systems (Rank X). The utilization findings showed that mobile applications were most frequently used for farmer advisory and consultation services (69.11%), followed by government schemes, subsidies and insurance (60.98%) and breeding and reproduction (55.28%). Web portals were predominantly utilized for government schemes (63.41%) and animal health record maintenance (56.91%), while webinars were mainly used for online training and education (56.91%) and expert interaction (52.03%). Social media platforms were widely utilized for farmer advisory and consultation services (69.11%), expert interaction (58.54%) and livestock market information (56.91%), whereas video modules were primarily utilized for online training and education (56.91%) and breeding and reproduction (55.28%). In contrast, websites showed comparatively lower utilization, while expert systems, MOOCs and television recorded consistently high levels of non-utilization across most livestock information areas. The findings suggest that veterinarians predominantly relied on interactive and easily accessible e-Extension modules for obtaining professional information and delivering veterinary advisory services.

Keywords: E-extension, veterinarians, veterinary assistant surgeons, ICTs

Introduction

Livestock is a vital component of India's agricultural economy and serves as a key source of income, nutrition, and employment for millions of rural households. The livestock sector contributed approximately 30.23 per cent of the agricultural Gross Value Added (GVA) and about 5.50 per cent of the total national GVA in India in 2022-23 (DAHD, 2024-2025) [2]. Veterinarians play a central role in ensuring livestock health, disease prevention, productivity enhancement, and food safety. Continuous skill upgradation and capacity building of veterinarians are therefore

essential. However, conventional capacity building programmes face challenges such as high costs, limited outreach, time constraints, and inadequate follow-up (Kumar *et al.* 2016) [9]. In recent years, the advancement of Information and Communication Technologies (ICTs) has transformed the delivery of extension and training services. ICT-based "e-Extension" modules including mobile applications, video modules, web portals, multimedia digital content, and interactive expert systems offer innovative ways for veterinarians to access need-based information anytime and anywhere (Anwar & Dhara, 2022) [1]. These

digital tools enable interactive, self-paced learning and can enhance decision-making by providing real-time data and expert knowledge. Previous studies have also reported the potential of ICT-based approaches in improving veterinary capacity and extension service delivery (Kumar *et al.* 2016; Jena *et al.* 2020; Burgess *et al.* 2022; Berendes *et al.* 2023) [9, 6, 4, 3]. In Telangana, the Department of Animal Husbandry and P.

V. Narsimha Rao Telangana Veterinary University have initiated various e-Extension programmes to enhance outreach and provide on-demand expert guidance to veterinary professionals. However, there is limited empirical evaluation of how effectively these digital tools are being utilized and contributing to capacity building among veterinarians in Telangana. Therefore, the present study was undertaken to study the utilization pattern of e-Extension modules of among veterinarians of south zone in Telangana.

Materials and Methods

The study was conducted in Telangana State, which was stratified into Northern, Central, and Southern Telangana zones. The present study was confined to the Southern Telangana zone, comprising Jogulamba Gadwal, Narayanpet, Wanaparthi, Nalgonda, Suryapet, Nagarkurnool, Rangareddy, Medchal-Malkajgiri, Yadadri-Bhuvanagiri, Vikarabad and the state capital region of Hyderabad.

A Proportionate Stratified Random Sampling method was adopted for selection of the respondents. The population consisted of Veterinary Assistant Surgeons (VAS) working in the Veterinary and Animal Husbandry Department of Telangana State. Of the total 885 VAS working in the state, 363 were from the South Zone, from which 123 respondents were selected. Within the zone, respondents were selected through simple random sampling using the list of Veterinary Assistant Surgeons obtained from the Veterinary and Animal Husbandry Department.

The utilization pattern of e-Extension modules was operationally defined as the extent to which veterinarians accessed, handled and used e-Extension modules for professional activities and livestock advisory services. It was studied under two components, namely handling and utilization. Handling was assessed based on respondents' preference for different e-Extension modules. Nine modules were considered, namely mobile apps, websites, web portals, webinars, social media platforms, video modules, expert systems, MOOCs and digital manual. Responses were recorded as Most Preferred, Preferred and Not Preferred and expressed using frequencies, percentages, weighted mean score and ranking. Utilization was assessed based on the frequency with which respondents used e-Extension modules for obtaining information related to professional work, diagnosis, treatment, advisory services and consultation. The frequency of utilization was recorded as Frequently, Occasionally and Never, with scores of 3, 2 and 1, respectively. The results were expressed in terms of frequencies and percentages.

Data were collected through a structured questionnaire administered through online mode. The questionnaire was shared with the respondents through WhatsApp in the form of Google Forms. The collected data were coded, tabulated and analyzed using frequencies, percentages, arithmetic

mean, standard deviation, total weighted score and ranking. Statistical analysis was carried out using SPSS Statistics version 16.0.

Results and Discussion

Handling

Mobile applications secured the first rank with a TWS of 305. Under this category, 47.97 per cent of the respondents reported them as most preferred, while 52.03 per cent considered them preferred and none reported them as not preferred. Social media platforms occupied the second rank with a TWS of 290. The highest proportion of respondents (62.60%) considered them preferred, followed by 36.59 per cent who reported them as most preferred, while only 0.81 per cent did not prefer them. Webinars secured the third rank with a TWS of 281. Among the respondents, 43.90 per cent considered them preferred, followed by 42.27 per cent who reported them as most preferred, while

13.82 per cent did not prefer them. Digital manuals ranked fourth with a TWS of 264. More than half of the respondents (51.22%) considered them preferred, followed by 31.71 per cent who reported them as most preferred and 17.07 per cent who did not prefer them. Web portals occupied the fifth rank with a TWS of 246. The most preferred category accounted for 37.40 per cent, while 32.52 per cent each reported them as preferred and not preferred. Websites secured the sixth rank with a TWS of 243. Among the respondents, 37.40 per cent considered them preferred, followed by 32.52 per cent who did not prefer them and 30.08 per cent who reported them as most preferred. Video modules occupied the seventh rank with a TWS of 241. About 39.02 per cent of the respondents considered them preferred, while 32.52 per cent did not prefer them and 28.46 per cent reported them as most preferred.

MOOCs secured the eighth rank with a TWS of 193. A majority of the respondents (60.98%) did not prefer them, while 21.14 per cent considered them preferred and 17.89 per cent reported them as most preferred. Expert systems received the ninth rank with a TWS of 184. The highest proportion of respondents (66.67%) did not prefer them, followed by 17.89 per cent who considered them preferred and 15.45 per cent who reported them as most preferred. The observed trend might be because mobile apps were preferred more as they provide information in a simple, quick and user-friendly manner and can be easily accessed during field work. Social media platforms might have been used more because they allow rapid exchange of information, discussion with peers and timely updates. A considerable preference for webinars could be due to opportunities for direct interaction with experts and learning about recent developments, while digital manuals may have been preferred as ready reference material for technical guidance. In contrast, expert systems and MOOCs might have been less preferred because they could be perceived as less familiar, time consuming or not as convenient for immediate field level needs compared to other commonly used digital sources.

These findings are partially in line with Kumari (2020) [7], who reported high preference for WhatsApp and other social media platforms, and Kumar and Naik (2025) [8], who highlighted that internet-based sources were the most preferred information sources (Table 1).

Table 1: Distribution of veterinarians according to handling of e-Extension modules N=123

Sl. No.	e- Extension modules	MP	P	NP	TWS	Ranking
1	Mobile apps	59 (47.97)	64 (52.03)	0 (0.00)	305	1
2	Websites	37 (30.08)	46 (37.40)	40 (32.52)	243	6
3	Web portals	46 (37.40)	37 (30.08)	40 (32.52)	246	5
4	Webinars	52 (42.27)	54 (43.90)	17 (13.82)	281	3
5	Social media platforms	45 (36.59)	77 (62.60)	1 (0.81)	290	2
6	Video modules	35 (28.46)	48 (39.02)	40 (32.52)	241	7
7	Expert systems	19 (15.45)	22 (17.89)	82 (66.67)	184	9
8	MOOCs	22 (17.89)	26 (21.14)	75 (60.98)	193	8
9	Digital Manual	39 (31.71)	63 (51.22)	21 (17.07)	264	4

(Figures in parenthesis indicate percentage)

Note: MP-Most Preferred, P- Preferred, NP-Not Preferred, TWS-Total Weighted Score

Utilization

As presented in Table 2, information related to livestock disease diagnosis and treatment, frequent utilization was highest for mobile apps, web portals, social media platforms and video modules, each accounting for 48.78 per cent, followed by webinars at 40.65 per cent. Websites were occasionally utilized by 34.15 per cent, while never utilization was reported by 39.84 per cent. Among the remaining modules, 49.59 per cent never utilized expert systems, 52.85 per cent never utilized MOOCs and 68.29 per cent never utilized television. Deworming and vaccination showed a different pattern, with mobile apps being occasionally utilized by the highest proportion of respondents (65.85%). Frequent utilization was highest for web portals (42.28%), followed by social media platforms (40.65%), video modules (39.02%), webinars (35.77%) and websites (19.51%). Never utilization was reported by 54.47 per cent for expert systems and MOOCs, while television recorded 65.85 per cent.

In relation to disease control practices, social media platforms recorded the highest frequent utilization (50.41%), followed by mobile apps, web portals and video modules at 47.15 per cent each and webinars at 42.28 per cent. Websites were never utilized by 39.02 per cent of the respondents. The corresponding figures for expert systems, MOOCs and television under never utilization were 52.85, 54.47 and 68.29 per cent, respectively. For feeding, fodder and nutrition management, social media platforms recorded 52.03 per cent frequent utilization, followed by mobile apps (50.41%), web portals and video modules (48.78% each) and webinars (43.90%). Websites were occasionally utilized by 33.33 per cent. Never utilization was reported for expert systems by 51.22 per cent, MOOCs by 52.85 per cent and television by 63.41 per cent.

The pattern observed for feed formulation and ration balancing showed frequent utilization of social media platforms at 45.53 per cent, followed by web portals and video modules at 42.28 per cent each, and mobile apps and

webinars at 40.65 per cent each. Websites recorded 35.77 per cent occasional utilization. Expert systems, MOOCs and television recorded 47.97, 50.40 and 69.92 per cent, respectively, under never utilization. For breeding and reproduction, video modules were frequently utilized by the highest proportion of respondents (55.28%), followed by social media platforms (48.78%), mobile apps and web portals (47.15% each) and webinars (42.28%). Websites recorded 41.46 per cent never utilization. Never utilization was also high for expert systems (49.59%), MOOCs (51.22%) and television (64.23%).

The use of e Extension modules for scientific farm management practices was highest under frequent utilization for video modules (44.63%), followed by web portals (43.90%), mobile apps and social media platforms (42.28% each) and webinars (39.02%). Websites recorded 36.59 per cent occasional utilization, whereas never utilization was reported for expert systems (56.10%), MOOCs (54.47%) and television (61.79%). In the case of housing, sanitation and farm hygiene practices, social media platforms recorded the highest frequent utilization (47.15%), followed by web portals (45.53%), mobile apps (44.72%), video modules (43.90%) and webinars (40.65%). Websites showed 37.40 per cent occasional utilization. Expert systems and MOOCs recorded 56.10 per cent never utilization each, while television recorded 59.35 per cent.

The utilization of modules for clean milk production practices was highest under frequent utilization for social media platforms and video modules (45.53% each), followed by mobile apps and web portals (43.90% each) and webinars (39.02%). Websites recorded 34.96 per cent occasional utilization. Expert systems and MOOCs showed 47.15 and 56.10 per cent never utilization, respectively, while television recorded 68.29 per cent. Animal health record maintenance was most frequently supported through web portals, which recorded 56.91 per cent utilization, followed by mobile apps (40.65%), social media platforms (37.40%), video modules (35.77%) and webinars (34.15%). Websites recorded 42.28 per cent never utilization. Expert systems and television were never utilized by all respondents (100.00% each), while MOOCs recorded 99.19 per cent never utilization.

For animal welfare and biosecurity practices, frequent utilization was highest for social media platforms (48.78%), followed by mobile apps, web portals and video modules (45.53% each) and webinars (42.28%). Websites recorded 31.71 per cent occasional utilization. Never utilization was reported for expert systems by 54.47 per cent, MOOCs by 56.10 per cent and television by 65.04 per cent. The utilization pattern related to climate based livestock management practices showed 42.28 per cent frequent utilization each for mobile apps, web portals and social media platforms, followed by video modules (40.65%) and webinars (39.02%). Websites recorded 46.34 per cent never utilization. Expert systems and MOOCs recorded 54.47 per cent never utilization each, while television recorded 62.60 per cent.

For livestock market trends and price information, social media platforms recorded the highest frequent utilization (56.91%), followed by mobile apps and web portals (48.78% each) and webinars (43.90%). Video modules recorded 37.40 per cent frequent utilization, while websites

recorded 29.27 per cent occasional utilization. Expert systems, MOOCs and television showed 60.98, 59.35 and 54.47 per cent never utilization, respectively. With respect to processing and value addition of livestock products, video modules recorded the highest frequent utilization (47.15%), followed by social media platforms (44.72%), mobile apps (39.02%) and webinars and web portals (37.40% each). Websites recorded 46.34 per cent never utilization. Expert systems showed the highest non utilization at 67.48 per cent, followed by MOOCs (60.98%) and television (57.72%).

Entrepreneurship and livestock enterprise development recorded the highest frequent utilization through social media platforms (44.72%), followed by video modules (42.28%), mobile apps (36.59%), webinars (35.77%) and web portals (34.15%). Websites recorded 48.78 per cent never utilization. The corresponding never utilization figures were 73.98 per cent for expert systems, 59.35 per cent for MOOCs and 55.28 per cent for television. The use of modules for government schemes, subsidies and insurance information was highest through web portals, with 63.41 per cent frequent utilization, followed by mobile apps (60.98%) and social media platforms (52.85%). Webinars recorded 39.02 per cent frequent utilization and websites 35.77 per cent. Never utilization was recorded at 38.21 per cent for video modules, 72.36 per cent for expert systems, 62.60 per cent for MOOCs and 63.41 per cent for television. Farmer advisory and consultation services showed the highest frequent utilization through mobile apps and social media platforms (69.11% each), followed by web portals and video modules (42.28% each) and webinars (39.02%). Websites recorded 34.15 per cent occasional utilization. Expert systems, MOOCs and television recorded 73.98, 64.23 and 71.54 per cent, respectively, under never utilization. For expert interaction and farmer expert discussions, social media platforms recorded the highest frequent utilization (58.54%), followed by webinars (52.03%), mobile apps (39.02%) and video modules (34.15%). Websites and web portals showed 68.29 and 65.85 per cent never utilization, respectively. The corresponding figures for expert systems, MOOCs and television were considerably higher at 82.11, 75.61 and 86.99 per cent, respectively.

The highest frequent utilization for online training and education was recorded for webinars and video modules (56.91% each), followed by social media platforms (42.28%), mobile apps (36.59%) and web portals (35.77%). Websites recorded 37.40 per cent occasional utilization.

Expert systems showed 64.23 per cent never utilization, while MOOCs and television recorded 41.46 and 71.54 per cent, respectively. For research updates and new technology developments, social media platforms recorded the highest frequent utilization (52.85%), followed by mobile apps (44.72%) and web portals, webinars and video modules (43.90% each). Websites recorded 40.65 per cent never utilization. Expert systems and MOOCs showed 54.47 and 51.22 per cent never utilization, respectively, while television recorded 65.04 per cent.

Zoonotic disease prevention and control was frequently accessed through social media platforms by 48.78 per cent of respondents, followed by mobile apps, web portals and video modules at 47.15 per cent each and webinars at 40.65 per cent. Websites recorded 39.02 per cent never utilization. Expert systems, MOOCs and television recorded 56.10, 54.47 and 67.48 per cent, respectively, under never utilization. Finally, success stories, innovations and best practices recorded the highest frequent utilization through social media platforms (55.28%), followed by video modules (48.78%), webinars (40.65%) and mobile apps (39.02%). Web portals recorded 34.15 per cent frequent utilization, while websites showed 43.09 per cent never utilization. Expert systems recorded the highest non utilization (73.98%), followed by MOOCs (59.35%) and television (51.22%).

The findings showed that the utilization of e Extension modules varied according to the type of module and the information requirement of the veterinarians. Mobile applications, social media platforms, web portals, webinars and video modules were utilized more actively, particularly for information and activities directly related to routine veterinary and advisory work. This indicated that the respondents were making greater use of modules that supported their immediate information needs. In contrast, expert systems, MOOCs and television showed comparatively lower utilization across most of the information requirements. Their limited use was particularly evident for activities involving expert interaction, farmer consultation, training and access to livestock related information. The overall pattern suggested that veterinarians were more inclined towards e Extension modules that were actively used in their professional and extension activities, while modules with comparatively limited utilization remained less used. These findings are in line with the findings of Panda *et al.* (2018) ^[11] and partially in line with the findings of Shivalika *et al.* (2026) ^[16].

Table 2: Distribution of veterinarians based on utilization of e-Extension modules N=123

Sl. No.	Statements	Mobile apps			Websites			Web portals		
		F	O	N	F	O	N	F	O	N
1.	Livestock disease	60	40	23	32	42	49	60	38	25
	diagnosis and treatment	(48.78)	(32.52)	(18.70)	(26.02)	(34.15)	(39.84)	(48.78)	(30.89)	(20.33)
2.	Deworming and	8	81	34	24	48	51	52	48	23
	Vaccination	(6.50)	(65.85)	(27.64)	(19.51)	(39.02)	(41.46)	(42.28)	(39.02)	(18.70)
3.	Disease control practices	58	42	23	35	40	48	58	40	25
		(47.15)	(34.15)	(18.70)	(28.46)	(32.52)	(39.02)	(47.15)	(32.52)	(20.33)
4.	Feeding, fodder, and	62	40	21	39	41	43	60	40	23
	nutrition management	(50.41)	(32.52)	(17.07)	(31.71)	(33.33)	(34.96)	(48.78)	(32.52)	(18.70)
5.	Feed formulation and	50	40	33	27	44	52	52	40	31
	ration balancing	(40.65)	(32.52)	(26.83)	(21.95)	(35.77)	(42.28)	(42.28)	(32.52)	(25.20)
6.	Breeding and reproduction	58	38	27	30	42	51	58	38	27

		(47.15)	(30.89)	(21.95)	(24.39)	(34.15)	(41.46)	(47.15)	(30.89)	(21.95)
7.	Scientific farm management practices	52	45	26	26	45	52	54	44	25
8.	Housing, sanitation, and farm hygiene practices	(42.28)	(36.59)	(21.14)	(21.14)	(36.59)	(42.28)	(43.90)	(35.77)	(20.33)
9.	Clean milk production practices	55	40	28	18	46	59	56	42	25
		(44.72)	(32.52)	(22.76)	(14.63)	(37.40)	(47.97)	(45.53)	(34.15)	(20.33)
10.	Animal health record maintenance	54	42	27	28	43	52	54	44	25
		(43.90)	(34.15)	(21.95)	(22.76)	(34.96)	(42.28)	(43.90)	(35.77)	(20.33)
11.	Animal welfare and biosecurity practices	50	40	33	30	41	52	70	32	21
		(40.65)	(32.52)	(26.83)	(24.39)	(33.33)	(42.28)	(56.91)	(26.02)	(17.07)
12.	Climate-based livestock management practices	56	42	25	37	39	47	56	40	27
		(45.53)	(34.15)	(20.33)	(30.08)	(31.71)	(38.21)	(45.53)	(32.52)	(21.95)
13.	Livestock market trends and price information	52	42	29	22	44	57	52	40	31
		(42.28)	(34.15)	(23.58)	(17.89)	(35.77)	(46.34)	(42.28)	(32.52)	(25.20)
14.	Processing and value addition of livestock products	60	36	27	41	36	46	60	34	29
		(48.78)	(29.27)	(21.95)	(33.33)	(29.27)	(37.40)	(48.78)	(27.64)	(23.58)
15.	Entrepreneurship and livestock enterprise development	48	42	33	26	40	57	46	42	35
		(39.02)	(34.15)	(26.83)	(21.14)	(32.52)	(46.34)	(37.40)	(34.15)	(28.46)
16.	Government schemes, subsidies, and insurance information	45	42	36	22	41	60	42	42	39
		(36.59)	(34.15)	(29.27)	(17.89)	(33.33)	(48.78)	(34.15)	(34.15)	(31.71)
17.	Farmer advisory and consultation services	75	32	16	44	45	34	78	28	17
		(60.98)	(26.02)	(13.01)	(35.77)	(36.59)	(27.64)	(63.41)	(22.76)	(13.82)
18.	Expert interaction and farmer-expert discussions	85	24	14	36	42	45	52	40	31
		(69.11)	(19.51)	(11.38)	(29.27)	(34.15)	(36.59)	(42.28)	(32.52)	(25.20)
19.	Online training and education	48	40	35	5	34	84	10	32	81
		(39.02)	(32.52)	(28.46)	(4.07)	(27.64)	(68.29)	(8.13)	(26.02)	(65.85)
20.	Research updates and new technology developments.	45	42	36	17	46	60	44	40	39
		(36.59)	(34.15)	(29.27)	(13.82)	(37.40)	(48.78)	(35.77)	(32.52)	(31.71)
21.	Zoonotic disease prevention and control	55	40	28	34	39	50	54	40	29
		(44.72)	(32.52)	(22.76)	(27.64)	(31.71)	(40.65)	(43.90)	(32.52)	(23.58)
22.	Success stories, innovations, and best practices	58	40	25	38	37	48	58	40	25
		(47.15)	(32.52)	(20.33)	(30.89)	(30.08)	(39.02)	(47.15)	(32.52)	(20.33)
		48	42	33	29	41	53	42	40	41
		(39.02)	(34.15)	(26.83)	(23.58)	(33.33)	(43.09)	(34.15)	(32.52)	(33.33)

Sl. No.	Statements	Webinars			Social media			Video modules		
		F	O	N	F	O	N	F	O	N
1.	Livestock disease diagnosis and treatment	50	40	33	60	40	23	60	38	25
		(40.65)	(32.52)	(26.83)	(48.78)	(32.52)	(18.70)	(48.78)	(30.89)	(20.33)
2.	Deworming and Vaccination	44	46	33	50	48	25	48	50	25
		(35.77)	(37.40)	(26.83)	(40.65)	(39.02)	(20.33)	(39.02)	(40.65)	(20.33)
3.	Disease control practices	52	40	31	62	38	23	58	38	27
		(42.28)	(32.52)	(25.20)	(50.41)	(30.89)	(18.70)	(47.15)	(30.89)	(21.95)
4.	Feeding, fodder, and nutrition management	54	29	40	64	40	19	60	40	23
		(43.90)	(23.58)	(32.52)	(52.03)	(32.52)	(15.45)	(48.78)	(32.52)	(18.70)
5.	Feed formulation and ration balancing	50	36	37	56	40	27	52	40	31
		(40.65)	(29.27)	(30.08)	(45.53)	(32.52)	(21.95)	(42.28)	(32.52)	(25.20)
6.	Breeding and reproduction	52	38	33	60	38	25	68	34	21
		(42.28)	(30.89)	(26.83)	(48.78)	(30.89)	(20.33)	(55.28)	(27.64)	(17.073)
7.	Scientific farm management practices	48	44	31	52	45	26	54	42	25
		(39.02)	(35.77)	(25.20)	(42.28)	(36.59)	(21.14)	(44.63)	(34.71)	(20.66)
8.	Housing, sanitation, and farm hygiene practices	50	42	31	58	40	25	54	42	27
		(40.65)	(34.15)	(25.20)	(47.15)	(32.52)	(20.33)	(43.90)	(34.15)	(21.95)
9.	Clean milk production practices	48	42	33	56	40	27	56	40	27
		(39.02)	(34.15)	(26.83)	(45.53)	(32.52)	(21.95)	(45.53)	(32.52)	(21.95)
10.	Animal health record maintenance	42	40	41	46	40	37	44	40	39
		(34.15)	(32.52)	(33.33)	(37.40)	(32.52)	(30.08)	(35.77)	(32.52)	(31.71)
11.	Animal welfare and biosecurity practices	52	40	31	60	40	23	56	40	27
		(42.28)	(32.52)	(25.20)	(48.78)	(32.52)	(18.70)	(45.53)	(32.52)	(21.95)
12.	Climate-based livestock management practices	48	40	35	52	42	29	50	42	31
		(39.02)	(32.52)	(28.46)	(42.28)	(34.15)	(23.58)	(40.65)	(34.15)	(25.20)

Sl. No.	Statements	Webinars			Social media			Video modules		
		F	O	N	F	O	N	F	O	N
13.	Livestock market trends and price information	54	36	33	70	32	21	46	36	41
		(43.90)	(29.27)	(26.83)	(56.91)	(26.02)	(17.07)	(37.40)	(29.27)	(33.33)
14.	Processing and value addition of livestock products	46	40	37	55	38	30	58	38	27

		(37.40)	(32.52)	(30.08)	(44.72)	(30.89)	(24.39)	(47.15)	(30.89)	(21.95)
15.	Entrepreneurship and livestock enterprise development	44 (35.77)	40 (32.52)	39 (31.71)	55 (44.72)	38 (30.89)	30 (24.39)	52 (42.28)	38 (30.89)	33 (26.83)
16.	Government schemes, subsidies, and insurance information	48 (39.02)	36 (29.27)	39 (31.71)	65 (52.85)	38 (30.89)	20 (16.26)	40 (32.52)	36 (29.27)	47 (38.21)
17.	Farmer advisory and consultation services	48 (39.02)	36 (29.27)	39 (31.71)	85 (69.11)	28 (22.76)	10 (8.13)	52 (42.28)	40 (32.52)	31 (25.20)
18.	Expert interaction and farmer-expert discussions	64 (52.03)	34 (27.64)	25 (20.33)	72 (58.54)	32 (26.02)	19 (15.45)	42 (34.15)	38 (30.89)	43 (34.96)
19.	Online training and education	70 (56.91)	30 (24.39)	23 (18.70)	52 (42.28)	40 (32.52)	31 (25.20)	70 (56.91)	32 (26.02)	21 (17.07)
20.	Research updates and new technology developments.	54 (43.90)	38 (30.89)	31 (25.20)	65 (52.85)	38 (30.89)	20 (16.26)	54 (43.90)	40 (32.52)	29 (23.58)
21.	Zoonotic disease prevention and control	50 (40.65)	40 (32.52)	33 (26.83)	60 (48.78)	40 (32.52)	23 (18.70)	58 (47.15)	40 (32.52)	25 (20.33)
22.	Success stories, innovations, and best practices	50 (40.65)	38 (30.89)	35 (28.46)	68 (55.28)	36 (29.27)	19 (15.45)	60 (48.78)	38 (30.89)	25 (20.33)

Figures in parenthesis indicate percentage)

Note: F- Frequently, O-Occasionally, N-Never

N=123

Sl. No.	Statements	Expert System			MOOCs			Television		
		F	O	N	F	O	N	F	O	N
1.	Livestock disease diagnosis and treatment	26 (21.14)	36 (29.27)	61 (49.59)	20 (16.26)	38 (30.89)	65 (52.85)	11 (8.94)	28 (22.76)	84 (68.29)
2.	Deworming and Vaccination	18 (14.63)	38 (30.89)	67 (54.47)	16 (13.01)	40 (32.52)	67 (54.47)	7 (5.69)	35 (28.46)	81 (65.85)
3.	Disease control practices	22 (17.89)	36 (29.27)	65 (52.85)	18 (14.63)	38 (30.89)	67 (54.47)	10 (8.13)	29 (23.58)	84 (68.29)
4.	Feeding, fodder, and nutrition management	28 (22.76)	32 (26.02)	63 (51.22)	22 (17.89)	36 (29.27)	65 (52.85)	15 (12.20)	30 (24.39)	78 (63.41)
5.	Feed formulation and ration balancing	34 (27.64)	30 (24.39)	59 (47.97)	26 (21.14)	34 (27.64)	63 (51.22)	9 (7.32)	28 (22.76)	86 (69.92)
6.	Breeding and reproduction	30 (24.39)	32 (26.02)	61 (49.59)	26 (21.14)	34 (27.64)	63 (51.22)	13 (10.57)	31 (25.20)	79 (64.23)
7.	Scientific farm management practices	20 (16.26)	34 (27.64)	69 (56.10)	20 (16.26)	36 (29.27)	67 (54.47)	14 (11.38)	33 (26.83)	76 (61.79)
8.	Housing, sanitation, and farm hygiene practices	20 (16.26)	34 (27.64)	69 (56.10)	18 (14.63)	36 (29.27)	69 (56.10)	16 (13.01)	34 (27.64)	73 (59.35)
9.	Clean milk production practices	20 (16.26)	45 (36.59)	58 (47.15)	20 (16.26)	34 (27.64)	69 (56.10)	12 (9.76)	27 (21.95)	84 (68.29)
10.	Animal health record maintenance	0 (0.00)	0 (0.00)	123 (100.00)	0 (0.00)	1 (0.81)	122 (99.19)	0 (0.00)	0 (0.00)	123 (100.00)
11.	Animal welfare and biosecurity practices	22 (17.89)	34 (27.64)	67 (54.47)	20 (16.26)	34 (27.64)	69 (56.10)	13 (10.57)	30 (24.39)	80 (65.04)
12.	Climate-based livestock management practices	22 (17.89)	34 (27.64)	67 (54.47)	22 (17.89)	34 (27.64)	67 (54.47)	15 (12.20)	31 (25.20)	77 (62.60)
13.	Livestock market trends and price information	18 (14.63)	30 (24.39)	75 (60.98)	18 (14.63)	32 (26.02)	73 (59.35)	22 (17.89)	34 (27.64)	67 (54.47)
14.	Processing and value addition of livestock products	12 (9.76)	28 (22.76)	83 (67.48)	18 (14.63)	30 (24.39)	75 (60.98)	19 (15.45)	33 (26.83)	71 (57.72)
15.	Entrepreneurship and livestock enterprise development	8 (6.50)	24 (19.51)	91 (73.98)	20 (16.26)	30 (24.39)	73 (59.35)	21 (17.07)	34 (27.64)	68 (55.28)
16.	Government schemes, subsidies, and insurance information	10 (8.13)	24 (19.51)	89 (72.36)	16 (13.01)	30 (24.39)	77 (62.60)	14 (11.38)	31 (25.20)	78 (63.41)
17.	Farmer advisory and consultation services	8 (6.50)	24 (19.51)	91 (73.98)	14 (11.38)	30 (24.39)	79 (64.23)	8 (6.50)	27 (21.95)	88 (71.54)
18.	Expert interaction and farmer-expert discussions	2 (1.63)	20 (16.26)	101 (82.11)	4 (3.25)	26 (21.14)	93 (75.61)	0 (0.00)	16 (13.01)	107 (86.99)

(Figures in parenthesis indicate percentage) Note: F- Frequently, O-Occasionally, N-Never

Conclusion

The study concluded that e Extension modules had become useful digital resources for veterinarians in the South Zone of Telangana, particularly for meeting immediate professional and advisory information needs. Among the different modules, mobile applications emerged as the most

preferred medium, followed by social media platforms and webinars, indicating a clear inclination towards digital sources that were easily accessible, interactive and convenient for field level use. The utilization pattern further showed that mobile applications, social media platforms, web portals, webinars and video modules were actively used

across a wide range of livestock related information needs, with their use being particularly prominent for farmer advisory and consultation, government schemes, expert interaction, online training, research updates and livestock market information. In contrast, expert systems, MOOCs and television recorded consistently high levels of non-utilization, while websites showed relatively limited engagement. Overall, the findings demonstrated that veterinarians tended to favour digital platforms that provided quick access, practical information and opportunities for interaction. Strengthening the content, accessibility and user orientation of these preferred e Extension modules, while improving awareness and ease of use of less utilized platforms, could further enhance their contribution to veterinary professional development and livestock extension service delivery in Telangana.

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