

Determinants of Social Media Usage for Dissemination of Agricultural Technology by Extension Personnel in South Gujarat

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ABSTRACT

In India, the traditional approach to agricultural extension has primarily involved direct, in-person communication to share technology and information between researchers and farmers. However, ongoing issues like a lack of extension personnel and remote locations have historically hindered these conventional advisory services. To tackle these challenges, recent years have seen a shift towards digital solutions, with institutions such as the Indian Council of Agricultural Research (ICAR), Krishi Vigyan Kendras (KVKs), and State Agricultural Universities (SAUs) embracing Internet and social media platforms like WhatsApp, Facebook, and YouTube. This study explores the factors influencing social media use for spreading agricultural technology among 210 extension personnel across South Gujarat's seven districts, using an ex-post-facto research method. Data collected through structured interviews were analyzed using descriptive statistics, Karl Pearson's correlation, and step-down regression. The findings showed that most extension personnel were highly engaged digitally, with 65.71 per cent showing high engagement and 33.81 per cent very high engagement. Strong positive correlations were found between social media use and factors like information-seeking behaviour, e-readiness, mass media exposure, decision-making ability, and scientific orientation, while age and service experience had significant negative correlations. The step-down regression model explained 56.90 per cent of the variation in social media use ($R^2 = 0.569$), with age, education, mass media exposure, service experience, and management orientation being significant predictors ($p < 0.01$). The study concludes that the adoption of modern digital advisory services is largely driven by demographic and professional factors, suggesting that institutions should address generational gaps through targeted digital training and mentorship, and formally integrate social media tools into extension services.

Keywords: Social media usage, Extension personnel, Dissemination, Agricultural technology

INTRODUCTION

Social media has become a revolutionary tool in Internet-based communication, offering extensive opportunities for interaction and networking within the farming community. In India, agriculture is a cornerstone of the national economy but faces substantial challenges, including a shortage of extension personnel to effectively disseminate crucial information to all farmers. To bridge this gap, leveraging

social media platforms like Facebook, WhatsApp, and YouTube is essential. These platforms provide powerful means to share valuable agricultural practices, connecting extension personnel with farmers and experts. By facilitating knowledge exchange, social media empowers both extension personnel and farmers to learn from each other, fostering a dynamic learning and support community.

Recently, both extension personnel and farmers in India have widely adopted social media to enhance communication and expand their agricultural knowledge. Notably, organizations such as the Indian Council of Agricultural Research (ICAR), State Agricultural Universities (SAUs), Krishi Vigyan Kendras (KVKs), and NGOs have actively created multiple social media accounts. These platforms are invaluable for sharing information and insights on agricultural technologies. Extension personnel can directly connect with farmers, sharing important updates on the latest agricultural technology advancements, best practices, and relevant information via social media. Meanwhile, farmers use these platforms to seek guidance, ask questions, and share experiences with extension personnel and fellow farmers, creating a collaborative and supportive community.

Beyond cost-effective communication, social media fosters social connections and long-term engagement in extension programs (O'Neill et al., 2011). For the farming community, social media offers an effective way to network and gain social capital through trust, engagement, and community involvement (Stanley, 2013; Mains et al., 2013). Moreover, these tools significantly reduce issues of physical distance and isolation in agriculture (Varner, 2012). The rising use of social media among extension personnel and farmers in India is transforming agricultural communication and knowledge sharing. By harnessing digital platforms, they work together to improve the agricultural sector, leading to enhanced productivity and growth. Extension personnel use these platforms to reach larger audiences, overcome geographical barriers, and connect with farmers who previously lacked easy access to traditional extension services. Ultimately, using social media to disseminate agricultural technology presents an effective way to keep farmers informed and support ongoing research efforts.

While numerous studies have examined social media use among agricultural researchers and educators, less attention has been given to its specific role in disseminating agricultural technology by extension personnel. Documenting how social media directly benefits the farming community is essential. Understanding usage trends and developing strategies to integrate social media as a key component for agricultural technology dissemination are crucial steps in maximizing the reach of advisory services. Therefore, this research aims to assess the factors influencing social media use for disseminating agricultural technology by extension personnel in South Gujarat.

OBJECTIVES

1. To assess the extent of social media usage by extension personnel for disseminating agricultural technology in South Gujarat.
2. To identify the socio-economic factors influencing social media adoption and usage among extension personnel.

METHODOLOGY

This study was conducted in South Gujarat, covering all seven districts: Navsari, Valsad, Surat, Tapi, Narmada, Bharuch, and The Dang. A complete enumeration was used to select 30 extension personnel from Krishi Vigyan Kendras (KVKs) and line departments in each district, totaling 210 respondents. An ex-post-facto research design was employed, and data were collected through pre-tested structured

interviews. Secondary data were also gathered from reference books, research papers, journals, reports, and theses. Statistical tools like mean, frequency, percentage, standard deviation, Karl Pearson's correlation coefficient, and regression were used for analysis. MS Excel was used for tabulation, while IBM SPSS Statistics and R studio software were used for data analysis. Social media usage for agricultural technology dissemination was the dependent variable, defined as the extent of social media platform utilization by extension personnel for sharing agricultural information, measured through a specially developed Likert-type scale and categorized into low, medium, and high levels based on scores. Twelve independent variables—age, education, mass media exposure, service experience, scientific orientation, management orientation, decision-making ability, information-seeking behaviour, leadership ability, innovativeness, achievement motivation, and e-readiness—were included in the study.

RESULTS AND DISCUSSION

The analysis of social media usage among extension personnel revealed that the vast majority exhibited high levels of digital engagement, with 65.71 per cent in the high usage category and 33.81 per cent in the very high usage category. Only a negligible fraction (0.48%) reported medium usage, and none fell into the low or very low categories. This high adoption rate highlights a modern shift toward ICT-driven advisory frameworks, reflecting rapid digital penetration and widespread smartphone accessibility among agricultural extension professionals in the study area.

Given the high adoption and widespread digital engagement among extension personnel, it is recommended that agricultural universities and department heads integrate social media platforms (such as WhatsApp, YouTube, and specialized agricultural portals) into the formal components of extension service delivery. Policymakers should focus on providing advanced digital training, robust internet connectivity, and official recognition for online advisory work to bridge communication gaps and enhance the timely transfer of agricultural technologies to farmers. These findings align with those of Patel et al. (2021), Rathod et al. (2022), and Kumar and Chauhan (2023).

Relationship between social media usage and selected independent variables

The analysis showed a strong positive and significant correlation between extension personnel' social media usage and key behavioral attributes, including information-seeking behavior ($r = 0.545$), e-readiness ($r = 0.524$), mass media exposure ($r = 0.450$), decision-making ability ($r = 0.450$), and scientific orientation ($r = 0.427$). Additionally, management orientation ($r = 0.330$), achievement motivation ($r = 0.319$), innovativeness ($r = 0.268$), and education ($r = 0.176^*$) were significantly positively associated. These findings indicate that digitally prepared professionals who are proactive in acquiring knowledge and strategically oriented are more likely to integrate web-based tools into their advisory practices. These results align with the findings of James et al. (2020), Patel et al. (2021), Malik et al. (2021), Rathod et al. (2022), and Onyemekonwu et al. (2024).

Conversely, age ($r = -0.718$) and service experience ($r = -0.503$) showed strong negative correlations with digital platform utilization, highlighting a generational divide where younger professionals readily embrace modern social networks, while older staff may encounter technological barriers or rely on conventional communication channels. These findings are consistent with the observations of Tanko et al. (2013), Kabir and Roy (2015), and Fasina et al. (2022), who reported inverse trends regarding age and service tenure with ICT and digital tool adoption. However, these results differ somewhat from Prodhan and Afrad (2014), Samansiri and Wanigasundera (2014), and Crispus and Nakimbugwe (2024), who found non-significant relationships between age or experience and digital tool use. Interestingly,

leadership ability ($r = 0.038\text{NS}$) was found to be non-significant, suggesting that formal leadership traits do not directly drive personal engagement with social media, as administrative leaders may delegate online dissemination tasks rather than execute them personally.

Factors influencing social media usage for agricultural technology dissemination

The step-down regression model provided insights into the factors influencing social media usage among extension personnel. The model yielded an R^2 value of 0.569, indicating that the independent variables collectively explain 56.90 per cent of the variation in social media usage, with the remaining 43.10 per cent due to other unmeasured factors. This explanatory power is consistent with technology adoption frameworks in educational and rural settings, such as those reported by Balakrishnan (2017), where key determinants account for major variance in digital tool adoption.

Regression results revealed that age, education, mass media exposure, service experience, and management orientation were significant at the 1.00 per cent probability level, leading to the rejection of the null hypothesis for these variables. Conversely, scientific orientation, decision-making ability, information-seeking behavior, leadership ability, innovativeness, achievement motivation, and e-readiness were not significant, mirroring findings by Olaitan et al. (2024) and Zade et al. (2024) regarding non-significant demographic dimensions in ICT utilization models.

Age of the respondents

Age significantly and negatively influenced social media usage, with a partial regression coefficient of -1.131 ($p < 0.01$). This indicates that as age increases, social media usage for agricultural technology dissemination decreases. Specifically, for every one-unit increase in age, social media usage is predicted to decrease by 1.131 units. This negative relationship supports the notion that younger professionals more readily adapt to digital innovations, whereas older workers may face digital literacy barriers or resist technology (Matema et al., 2024). Similar age-related differences in digital engagement have been documented in technology acceptance literature, highlighting generational divides in technology assimilation (Rahman et al., 2021).

Education of the respondents

Education showed a positive and significant influence on social media usage, with a partial regression coefficient of 1.408 ($p < 0.01$). Each additional unit of educational attainment corresponded to an increase in social media usage by 1.408 units. This aligns with Matema et al. (2024), who found that higher education enhances cognitive readiness, confidence, and proficiency in using communication technologies for professional knowledge dissemination. This also supports Molla (2021), who found that educational background and structured learning objectives directly drive the active use of digital networks.

Mass media exposure of the respondents

Mass media exposure had a positive and highly significant influence on social media usage, with a partial regression coefficient of 0.575 ($p < 0.01$). Extension personnel who frequently engage with traditional mass media sources are likely more aware of contemporary digital trends, encouraging them to adopt social media as an effective dissemination tool. This is consistent with Zade et al. (2024), who found that regular engagement with traditional and modern media channels significantly correlates with ICT tool use. Broad exposure broadens cognitive horizons regarding media utility, aligning with general technology diffusion principles.

Service experience of the respondents

Service experience showed a significant impact on social media usage, with a partial regression coefficient-

ent of 0.386 ($p < 0.01$). While zero-order correlations suggested an inverse relationship due to established habits, the partial regression coefficient highlights unique institutional dynamics when other demographic factors are controlled. Similar trends where entrenched operational habits temper rapid digital adoption among highly tenured personnel have been observed in institutional ICT integration studies (Elnadi, 2022).

Management orientation of the respondents

Management orientation had a positive and significant effect on social media usage, with a partial regression coefficient of 0.224 ($p < 0.01$). This suggests that extension personnel with strong planning, organizational, and strategic thinking skills are more inclined to integrate social media into professional activities to efficiently achieve institutional extension goals, validating Elnadi's (2022) observations on organizational readiness and strategic administrative support driving modern digital extension efforts.

CONCLUSION

The study confirms that social media significantly enhances the capacity and motivation of extension personnel to disseminate agricultural information, creating expanded opportunities for knowledge transfer. A majority of respondents (65.71% high and 33.81% very high) reported heavy social media use for disseminating agricultural technology. Key socio-economic and psychological attributes—age, education, mass media exposure, service experience, and management orientation—had a notable impact on social media engagement. These variables should be central to future policy and advisory frameworks aimed at increasing digital adoption and communication effectiveness among extension personnel in agricultural development initiatives.

RECOMMENDATION

Based on the study's findings, it is recommended that state and institutional policy frameworks proactively address the digital divide by bridging generational gaps. Extension agencies should design specialized, hands-on digital training modules and peer-mentoring initiatives for senior or more experienced field personnel, directly offsetting the negative correlations linked to age and service length. Additionally, administrators should institutionalize digital advisory services by incorporating mandatory social media communication goals into regular performance tracking, supported by robust smartphone and internet connectivity at grassroots field units. To maximize impact, future agricultural development plans must strategically leverage officers' e-readiness, mass media exposure, and management orientation to accelerate technology transfer. State agricultural universities and extension departments should institutionalize continuous digital upgrading through routine workshops, content curation toolkits, and updated academic syllabi that cultivate high cognitive and technical readiness among upcoming extension professionals. This ensures that field personnel can efficiently convert modern web tools and information networks into accessible, actionable guidance for farming communities.

CONFLICT OF INTEREST

There are no conflicts of interest among any authors regarding the publication of this research paper in the journal or the content.

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