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The Impact of Digital Competence on Social Media Practices among Agricultural Research Scientists at Ayub Agricultural Research Institute, Faisalabad, Pakistan: An Analysis using Gratification Theory

Faiza Tabassum

Librarian, University of Education, Lahore, Pakistan

faiza.tabassum@ue.edu.pk

Muhammad Nadeem Akhtar

Head, Main Library & IT Department, Ayub Agricultural Research Institute, Faisalabad, Pakistan

ch.nadeem@aari.punjab.gov.pk

Prof. Dr. Khalid Mahmood

Pro Vice Chancellor, University of the Punjab, Lahore, Pakistan

khalid.im@pu.edu.pk

Sidra Batool

Technical Librarian, Ayub Agricultural Research Institute, Faisalabad, Pakistan

sidra.batool@aari.punjab.gov.pk

ABSTRACT

The increasing integration of digital technologies has reshaped professional landscapes including agricultural research where social media plays a crucial role in collaboration, knowledge dissemination and research outreach. This study examines the impact of digital competence on the social media practices of agricultural research scientists at Ayub Agricultural Research Institute (AARI), Faisalabad using Gratification Theory as a framework. Specifically, it explores how these scientists use social media to achieve social gratifications with digital competence as a key factor. Their engagement in broadening networks, maintaining ties, enjoyment, and tension release and fulfilling information needs is empirically analyzed. A quantitative research design was employed and data were collected from 281 agricultural research scientists at AARI through a structured questionnaire. The findings indicate a positive relationship between digital competence and social media engagement particularly in expanding professional networks, maintaining connections, enhancing enjoyment, relieving tension and meeting information needs. However, challenges such as limited digital skills, privacy concerns and inadequate institutional support hinder optimal usage. The study highlights the critical role of digital competence in maximizing social media's potential for agricultural research and underscores the need for institutional initiatives to bridge digital skill gaps. These insights offer valuable recommendations for fostering digital competence and leveraging social media to enhance research innovation and collaboration.

Keywords: Digital Competence; Social Media Practices; Agricultural Research; Agricultural Research Scientists; Gratification Theory; Ayub Agricultural Research Institute; AARI.

Introduction

Digital technology has transformed professional work environments in agricultural research and all other fields. Scientists now use social media platforms as essential tools for sharing knowledge by connecting to worldwide scholarly communities thus expanding their networks by accessing scholarly materials. Agricultural research scientists widely adopt Twitter, LinkedIn, Facebook and ResearchGate platforms to develop their professional network while exchanging information and securing professional growth opportunities. Scientists with advanced digital competence use social media to a greater extent while experiencing more gratifying benefits through these platforms. Academic and research social media practices depend heavily on digital competence described as the skill to utilize digital tools effectively for personal and educational and professional needs (Ferrari, 2013). Scientists with different degrees of digital competency demonstrate unique online conduct patterns that influence their success in scientific information distribution through social media and professional network development. Digital competence influences social media engagement through the Uses and Gratifications Theory (UGT) which serves as an effective analytical framework. According to UGT people consciously interact with media systems to address their particular requirements (Katz, Blumler, & Gurevitch, 1973). The data shows that social media tools bring positive effects to classroom cooperation especially when used by shy students studying at college level. According to Voorn and Kommers (2013) introverted students see social media as helpful because it can strengthen collaboration and boost self-confidence since they struggle in direct interactions so choose online communication. The study participants unanimously sought to increase the presence of social media in their educational environment. Research outcomes indicate that post-secondary establishments need to use social media platforms to promote collective student learning.

Having digital literacy enables users to access financial resources in addition to agricultural production services therefore they can convert e-commerce sales willingness into buying behavior for agricultural products (Zhang & Zhang, 2024). Notwithstanding, there are significant differences between levels of digital competence in different age groups and professional groups. For example, one study showed male college teachers thought that they were more digitally competent than female college teachers (Zhao et al., 2021). The variations indicate that there is no one digital competence which influences the social media practices the same across contexts and user groups.

Examining the relationship between digital competence and social media practices among agricultural research scientists is facilitated from a unique setting at Ayub Agricultural Research Institute (AARI), Faisalabad, a research center predominantly purposed for agricultural research and education. Given that the institution that is being investigated is as an institution of experts coming from different academic and research backgrounds, this is an ideal case to examine the role that digital literacy plays in improving social engagement through social media. The purpose of this study is to review the influence of digital competence on the social media use attitude of agricultural scientists at AARI and to examine to what extent the level of their digital skills modulates their social media use to network in the professional setting, disseminate the research and participate in academia. This thesis applies Gratification Theory to determine whether scientists with a higher digital competence get greater cognitive, social and personal gratifications from using social media platforms.

While much has been researched in terms of social media in the academic contexts (Veletsianos, 2012), there is a dearth in such research regarding the impact that digital competence plays in these behaviors and gratifications, hence, in developing countries such as Pakistan. Such gap is filled by this study using empirical insight within agricultural research scientists at AARI on how social media is used and how their digital skills contribute towards the social engagement of research on social media. This work will help the digital literacy programs, research support services, and fostering the use of social media for the research and professional development. The facility of researchers with digital competence among the agricultural scientists will not only support their engagement with digital platform but also optimize the application of their research findings in global research and agricultural community.

Literature Review

Digital Competence

Digital competence describes using digital technology with confidence and critical understanding for activities at work along with leisure needs and communication processes. The ability to operate digitally demands specific information together with practical capabilities as well as mental approaches for successful digital environment use (Cabero-Almenara et al., 2023). Scientists who are researchers must have digital competence skills to search databases and manage collaborative work through digital platforms and produce digital materials for dissemination (Ferrari, 2013). Educational instruction demands teachers to acquire both technology proficiency and classroom instruction digital abilities to successfully incorporate technology into their classroom activities (Krumsvik, 2008).

Higher education depends strongly on digital competence since it drives both curriculum design and staff professional development. University faculty members face digital skill limitations because they lack proper training and institutional support according to Ilomäki et al. (2016). Student academic outcomes increase when students develop their digital competence skills as established by Punie and Redecker (2017) research. According to Løvskar et al. (2024) digital competence discourses fail to address the examination of internet politics as they only focus on digital political participation. We need a critical method of teaching digital competence which includes analysis of ethics together with participation in democratic processes.

Digital competence emerged as a fundamental skill for modern society which consists of integrated areas related to digital technology usage. Students in compulsory education categories can have their digital competence evaluated through the INCODIES methodology which extracts concepts from DIGCOMP (Muñoz-Repiso et al., 2020). The experts validated this model which functions as a base to develop evaluation tests for specific purposes. Digital competence brings value to both individual people and organizational groups. Digital competence at the organizational hub consists of three elements: digital infrastructure and digital integration together with digital management (Yu & Moon, 2021).

Digital competence functions as a key tool for modifying corporate resources while boosting organizational performance throughout uncertain digital markets. The concept of digital competence consists of multiple aspects that begin with personal abilities but incorporate business functions as well. Digital competence remains vital because it benefactors individuals as well as professionals alongside all of society. Digital competence development continues as an ongoing challenge since multiple frameworks and assessment models are being validated by

experts to meet these requirements (Muammar et al., 2022; Tondeur et al., 2023). Technology's continuous advancements demand a permanent process of improving both digital competence measurement methods and our knowledge base about it.

Uses and Gratification Theory

The initial investigations into media preferences by people emerged from Uses and Gratification Theory during the decade of the 1940s. Audience satisfaction emerging from media usage was an initial emphasis prior to the 1970s when research shifted toward the psychological and social functions media provides to users. The Uses and Gratifications Theory (UGT) demonstrates that media audiences purposely choose their content selection to meet needs for gaining information as well as entertainment and developing personal identity and social relationships (Katz, Blumler & Gurevitch, 1973; Blumler & Katz, 1974). The theory indicates that how people use media stems from their personal motivations which shows that users behave as participants rather than passive receivers because they consume content to reach their cognitive emotional and social desires. UGT shows how social media networks serve think and feel requirements during luxury brand promotional activities (Athwal et al., 2018). People choose their social media platform based on gratification needs which affects their behavior toward fake news sharing either through immediate sharing or news verification (Sampat & Raj, 2022).

Users engage in narrative analyses to determine brand value which strengthens market relevance in the psychological analysis of marketing. UGT explains social media knowledge-sharing behavior through its partnership with Social Exchange Theory and Self-Determination Theory as explained by Yaqub and Alsabban (2023). User groups with elevated motivation levels choose to distribute knowledge through digital platforms which helps the spread of digital information. Social media usage among men versus women exhibits separate engagement behaviors especially when it comes to fitness content consumption according to Klenk et al. (2017). Research on tourism shows that users through UGT actively utilize social platforms to request recommendations and exchange travel stories that produce UGC and eWOM content (Chavez et al., 2020).

The application of UGT helps researchers understand how people share fake news specifically in the context of the COVID-19 pandemic. UGT collaborators with SNS Dependency Theory and Social Impact Theory demonstrate how persons disseminate fake news through tie strength together with perceived herd factors and Para social relationships (Apuke & Omar, 2020). Social media platforms serve as platforms where misinformation both grows and gets addressed to the public. The key drivers of consumer social media brand interaction according to UGT are the socio-psychological gratifications including entertainment, social bonding and information-seeking (Osei-Frimpong et al., 2022). Researchers have proven that Facebook users employ three key motivations including enjoyment for liking behavior with information-seeking and social connection factors (Hossain et al., 2019). Science communication studies apply the Cognitive Mediation Model to UGT through a research model that reconstructs how social media gratifications affect news attention and elaboration (Ho et al., 2016). Various personality traits along with demographical aspects affect how people use social media through their motivation levels and their selected features. The use motives and platform selection of individuals are guided by both their narcissism and Big Five personality traits according to Chen and Peng (2022).

Science content interestingness and the requirement to access fact-based information drive user interactions. The User Gratification Theory recognizes four primary dimensions of user satisfaction and platform engagement which include social elements as well as hedonic experiences and procedural values and content-based features (Krasnova et al., 2017). Katz, Blumler and Gurevitch (1973) established that the initial period of media research centered on how media functions as a source of information and entertainment and social reassurance provider. Herzog (1942) together with Berelson (1949) pioneered the foundation of UGT before they performed specific evaluations of audience demands. The scientific community established UGT as an essential model for interpreting user-initiated media interaction in modern times. The research results deliver crucial insights which platform developers need to consider together with marketing teams while also helping to mitigate digital exclusion and false information spread on social media platforms (Al-Muwil et al., 2019; Ho et al., 2016).

Theoretical Framework

The researchers used the research design presented in “Will Digital Fluency Influence Social Media Use? An Empirical Study of WeChat Users” by Li et al. (2018). An Empirical Study of WeChat Users” by Li et al. (2018). These theoretical grounds explain social media utilization for pleasure by using the Uses and Gratifications Theory (UGT). Digital fluency shares similarities but demonstrates different traits from digital competence which require separate clarification. The modification from Digital Fluency to Digital Competence in the research model is justified on conceptual, theoretical, empirical and contextual grounds. This study examines the impact of Digital Competence on social media practices among agricultural research scientists at Ayub Agricultural Research Institute, AARI, Faisalabad, making Digital Competence a more comprehensive and appropriate construct than Digital Fluency. The questionnaire items explicitly measure the ability to use social media for research, articulate research ideas, share findings, critically evaluate information and expand professional networks, all of which align with Digital Competence rather than Digital Fluency.

Conceptually, Digital Fluency refers to the ability to adapt to digital tools efficiently and creatively but does not necessarily include critical evaluation, responsible use and ethical considerations (Spante et al., 2018). However, agricultural scientists require more than fluency they need competence in verifying information, collaborating professionally and responsibly engaging in digital scientific discourse. According to Ferrari (2012), Digital Competence encompasses technical proficiency, critical thinking, information literacy, ethical awareness and digital communication skills which are essential for scientists using social media for professional purposes. The European Commission’s DigComp Framework further defines Digital Competence as the confident, critical and responsible use of digital technology for learning, work and participation in society (Carretero et al., 2017). Since the questionnaire items specifically assess confidence in research-based social media engagement, the ability to articulate findings and information-seeking behaviors, Digital Competence is the more relevant construct.

The theoretical foundation of this study is based on the Uses and Gratifications Theory (UGT), Katz et al., (1973) which explains how individuals actively use media to fulfill specific needs. The model categorizes gratifications into Social, Hedonic, Process and Content Gratifications, all of which are better explained by Digital Competence than Digital Fluency. Content gratification is evaluated through questions related to information need fulfillment as scientists rely on social

media to access, verify and share research trends and he further defines media literacy as the knowledge and skills needed to analyze, evaluate and create media messages across industries, messages, audiences and effects (Martens, 2010). Process gratification which includes tension release and efficient use of digital tools is also measured in the questionnaire as competent users can navigate digital platforms with greater ease and efficiency (Siddiq et al., 2016).

The professional enjoyment aspect within the questionnaire examines social media usage for professional purposes thus matching with better digital competence skills and digital confidence. Digital Competence directly impacts user satisfaction on social media so researchers should use it as the main construct in their modified model. Social media uses for professional purposes depend heavily on the hedonic gratification component and in particular on the aspect of enjoying these tools. Other elements like utilitarian value and context together with user familiarity control the extent of this influence. The analysis of user enjoyment regarding professional social media utilization enables developers and organizations to enhance their products and produce more feasible platforms and services that match user needs better (Hossain et al., 2019; Jung et al., 2018).

Additional evidence from direct observations backs up this change. The research findings demonstrate Digital Competence functions as a better indicator than Digital Fluency does to predict social media usage among professionals. The evaluation of online information combined with preventing misinformation and practicing responsible digital engagement characterizes Digital Competence as necessary for scientific research dissemination through social media according to Hobbs (2017). Because the survey evaluates competency areas from Digital Competence including new research trend identification along with idea creation and social media-based research decision making the construct demonstrates superior validity over Digital Fluency. Sustainable scientific use of social media includes interactions for professional networking and the exchange of reliable scientific content and scientific research outputs by agricultural research scientists. The survey platform examines social media benefits through assessment of research cooperative operations and expanded working connections and information transmission mechanisms. To succeed as researchers agricultural scientists require competencies in assessing scientific credibility and scientific discussion activities which fit under Digital Competence rather than Digital Fluency (Punie & Redecker, 2017). The evaluation through the questionnaire explicitly addresses researchers' competence with social media for their work while disseminating scientific materials and digital tool discovery for career development thus making Digital Competence more appropriate.

This modification brings Digital Competence instead of Digital Fluency to the study which improves conceptual precision while enhancing both theoretical accuracy and empirical validity and context-based relevance. The questionnaire focuses on evaluating competencies involving research based social media practices, information verification and professional engagement which support the use of Digital Competence as the selected construct. The model becomes more applicable through this modification because it includes necessary evaluation with ethical components when people interact with science on social media platforms. The modified research model achieves a stronger correspondence with the Uses and Gratifications Theory (UGT) since Digital Competence demonstrates its effects on both social and content and processing and hedonic gratifications to explain completely how and why agro-scientific users engage with social media. The strong empirical evidence demonstrates Digital Competence

delivers superior prediction of professional social media practices than Digital Fluency which underscores the requirement for modification. The updated model delivers a comprehensive assessment of digital skills affecting social media utilization practices at AARI Faisalabad which leads to enhanced validity of this research project.

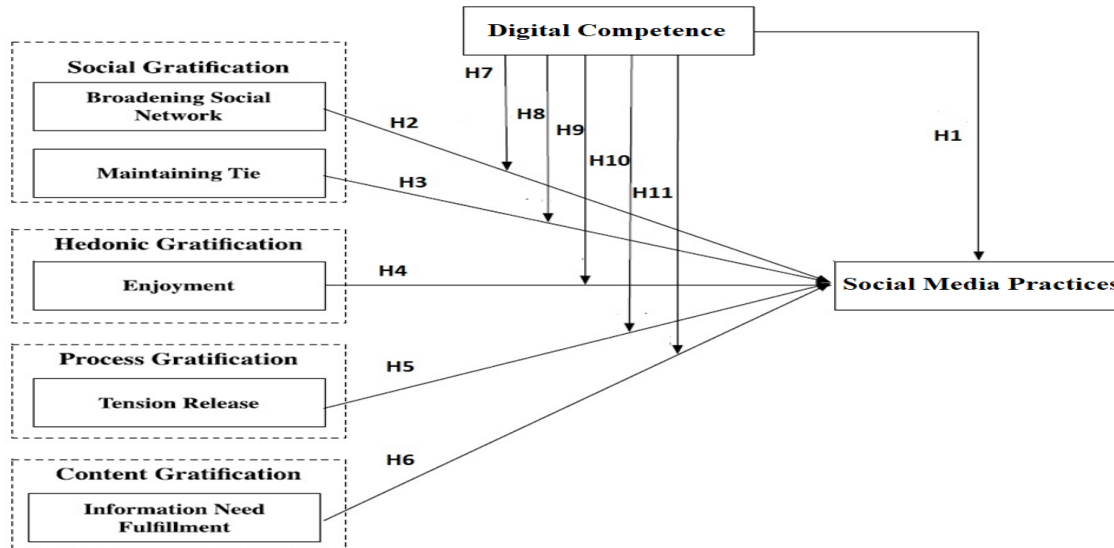


Figure 1. Research Model

This model hypothesizes that digital competence directly influences social media practices, which are mediated by the gratification derived from these activities. There are multiple gratifications of social media practice including “Broadening Social Network”, “Maintaining Social Ties”, “Enjoyment”, “Tension Release”, “Information Need Fulfillment” and the use of “Social Media Practices” (See in Figure 1).

Broadening Social Network

People use social media to engage in various activities and connect with others who share similar interests, even without prior real-life interaction. According to Ellison, Steinfield and Lampe (2011), social networking sites such as Facebook enable individuals to maintain existing relationships while fostering new connections that contribute to an expanded social network. Furthermore, Hampton, Lee and Her (2011) found that social media enhances weak ties by allowing users to interact with diverse individuals across different geographic locations. Treem and Leonardi (2013) further emphasized that digital platforms facilitate network expansion by breaking physical and social barriers, enabling people to connect and collaborate in ways that were not possible before.

Maintaining Social Ties

One of the major reasons individuals use social media is to establish and maintain online connections. People with similar interests engage in virtual interactions and communicate with others with whom they may not have had prior real-world interactions. Burke and Kraut (2014) demonstrated that frequent social media interactions with close ties enhance relationships and provide emotional support, reinforcing the importance of social media in sustaining strong ties. Additionally, Manago, Taylor and Greenfield (2012) highlighted that digital communication

allows users to stay connected with distant friends and relatives, reducing feelings of social isolation while fostering a sense of belonging.

Enjoyment

Social networking platforms provide users with entertainment and self-expression opportunities, making social media an enjoyable experience. Through visual storytelling Instagram platforms allow users to achieve enjoyment by letting them express themselves creatively according to Sheldon and Bryant (2016). Wohn and Lee (2013) discovered that social media gratifications which include likes comments and badges create enhanced user enjoyment in digital platform interaction.

Tension Release

Social media provides users with retreat from daily stress through entertainment opportunities that help them destress and relax. People select Facebook and Twitter as platforms for redirecting themselves away from worries because these platforms provide psychological peace of mind according to research findings. Oh and Syn (2015) discovered that Facebook users provide assistance to friends as well as strangers due to which their emotional wellness increases according to their findings. Research conducted by Nabi, Prestin and SO (2013) demonstrated that exposure to positive social media content effectively minimizes person stress. Social networking sites enable people to manage emotional pain through interactive participation according to Reinecke and Trepte (2014). Furthermore, Leung (2006) argued that individuals turn to social media for entertainment and relaxation, using digital interactions as a means of emotional escape.

Information Need Fulfillment

The rapid growth of information and communication technologies has led to an overwhelming availability of online content. Social media provides users with multiple sources of information, making it an essential tool for learning and staying informed. Various institutions, including government agencies, libraries, archives, museums and private organizations, maintain social media pages to cater to users' informational needs. According to Castillo, Mendoza and Poblete (2011), social media platforms act as real time information channels, particularly during crisis situations where users seek urgent updates. Morris, Teevan and Panovich (2010) found that people increasingly turn to social media for expert opinions and recommendations, supplementing traditional sources of knowledge. Metzger, Flanagin and Medders (2010) emphasized that while social media provides a wealth of information, users must develop critical evaluation skills to distinguish between reliable and misleading content. As digital literacy improves, social media continues to be a key resource for satisfying users' information needs in various fields.

Research Questions

- Does digital competence directly affect social media practices?
- Does digital competence moderate the relationship between different individual gratifications (broadening social networks, maintaining ties, enjoyment, tension release and information need fulfillment) and social media practices?

Digital competence significantly influences individual gratifications and social media practices of agricultural research scientists in several ways: Digital competence plays a crucial role in how agricultural research scientists engage with and benefit from social media platforms. The research confirms digital competence determines how users experience gratifications through

social media especially in information and data processing and communication methods and safety responsibilities (Zhao et al., 2021). Agricultural researchers need these competencies to use social media effectively for their professional objectives including research finding publication and professional peer networking. Research sees digital competence as mainly positive but its effect on social media usage has contradictory findings. Research studies conducted by Anderson et al. (2023) demonstrated that interest or curiosity did not demonstrate significant relevance towards the social media community need (Anderson et al., 2023). Digital competence and social media involvement combine in complex ways because individual drive systems and cultural elements affect their relationship.

The way agricultural research scientists utilize and gain benefits from social media platforms is directly determined by their digital competence abilities. Their ability to spread knowledge and work together with peers and participate in professional training depends on their digital competence level (Chen et al., 2023; Osterrieder, 2013). The effects of digital competence on social media usage demonstrate diversity between users because information value together with personal reasons act as moderating elements (Orchard et al., 2014). The progress of digital agriculture demands both increased attention to digital literacy inequalities and emancipatory initiative promotion since this will help all agricultural researchers utilize social media effectively for their work (Hackfort, 2021).

Hypothesis

The researchers at Ayub Agricultural Research Institute, Faisalabad use use and gratification theory to understand how they utilize social media for their scientific work. Digital competence directly influences social media usage through mediating effects of multiple gratifications according to the following details.

Hypotheses

The Alternative Direct Effects Hypotheses

- H1: Digital competence positively influences scientists' social media practices.
- H2: Broadening social networks positively influences scientists' social media practices.
- H3: Maintaining social ties positively influences scientists' social media practices.
- H4: Enjoyment positively influences scientists' social media practices.
- H5: Tension release positively influences scientists' social media practices.
- H6: Information need fulfillment positively influences scientists' social media practices.

The Alternative Moderation Hypotheses

- H7: Digital competence plays moderating role between the relationship among broadening social networks and scientists' social media practices.
- H8: Digital competence plays moderating role between the relationship among maintaining social ties and scientists' social media practices.
- H9: Digital competence plays moderating role between the relationship among enjoyment and scientists' social media practices.
- H10: Digital competence plays moderating role between the relationship among tension release and scientists' social media practices.
- H11: Digital competence plays moderating role between the relationship among information need fulfillment and scientists' social media practices.

Research Methodology

The study employed the quantitative research approach to address the research question and test the hypothesis. The survey method was used to collect the data and quantitatively validate items based on the use and gratification theory. Data were collected from the Agricultural Research Scientists of Ayub Agricultural Research Institute, Faisalabad. The Agricultural Research Scientists using social media platforms (e.g., Facebook, Twitter, LinkedIn and ResearchGate) were invited to participate in the survey via Google Forms.

Data Analysis

The collected data were analyzed by using Statistical Package for Social Sciences (SPSS). After analyzing the data were presented in the form of tables. Computation of frequency, percentage, mean, standard deviation and inferential statistics were applied.

Research Questions

How does digital competence directly affect social media practices and digital competence moderate the relationship between different individual gratifications (broadening social networks, maintaining ties, enjoyment, tension release and information need fulfillment) and social media practices? To explore the alternative direct impact and alternative moderating impact of digital competence on the scientists' gratifications and their practices of social media hierarchical regression was carried out in SPSS (Table 2).

Table 2

<i>Hypothesis</i>	<i>Constructs</i>	<i>ANOVA</i>	<i>Sig.</i>	<i>R</i>	<i>R2</i>	<i>β</i>	<i>t</i>	<i>p</i>	<i>Conclusion</i>
<i>H1</i>	DC	23.52	.000		0.496	0.605	4.85	0.000	Rejected
<i>H2</i>	BSN					0.376	2.86	0.006	Rejected
<i>H3</i>	MST					0.456	3.37	0.001	Rejected
<i>H4</i>	ENJ					0.298	2.19	0.032	Rejected
<i>H5</i>	TR					0.319	2.03	0.046	Rejected
<i>H6</i>	INF					0.595	5.00	0.000	Rejected

M1. Predictors: DC, BSN, MST, ENJ, TR, INF

Dependent Variable: Social Media Practices

The results of hierarchical regression showed that the good fit data to the linear regression model, which explained that digital competence (Independent variable) has moderate effect on the scientists' practice of social media (Dependent Variables) as the Beta value is .605, t value 4.85, and P value is .000, which is less than .05, so the null hypothesis is rejected. The table shows that there is moderate effect of broadening social networks on researchers' social media practice as the Beta value is .376, the t value is 2.86, and the P value is .006, and the null hypothesis is rejected. The model showed that there is a moderate effect of maintaining social ties on researchers' social media practice because the Beta value is .456, the P value is .001, and the t value is 3.37, meaning the null hypothesis is rejected.

Moreover, the results in the table demonstrated that there is a moderate effect on enjoyment on the scientists' social media practice as the Beta value is .298, and the P value is .032, which means the null hypothesis is rejected. The table revealed the results towards the moderate effect of tension release on the scientists' social media practice ($\beta=.319$, $t= 2.09$, $p = .046$), which indicated that the null hypothesis is rejected, and there is a moderate effect of tension release on the scientists' social media practice. The H6 test results showed that ($\beta=.595$, $t= 5.00$, $p =.000$). The results of the table showed that there is the moderate effect of information need fulfillment and the use of social media, and the null hypothesis is rejected.

Model 2 (Moderating Effect)

Hypothesis	Constructs	ANOVA	Sig.	R	R2	β	t	p	Conclusion
H7	BSNxDC	3.448	.008		.250	.047	.264	.793	Accepted
H8	MSTxDC					-.182	-1.013	.315	Accepted
H9	ENJxDC					-.018	-.157	.875	Accepted
H10	TRxDC					.076	.797	.428	Accepted
H11	INFxDC					-.173	-1.375	.174	Accepted

M2. Predictors: BSNxDC, MSTxDC, ENJxDC, TRxDC, INFxDC

Dependent Variable: Social Media Practices

Model 2 demonstrated the results of the moderating effect of digital competence on the relationship between gratifications theory (broadening social network, maintaining ties, enjoyment, tension release, and information need fulfillment) and social media practice. The results pointed out that there is a positive moderating effect of digital competence on the relationship between broadening social networks and researchers' social media practice but not statistically significant, as results showed ($\beta=.047$, $t=.264$, $p = .793$) and the null hypothesis is accepted. From the table it is evident that DC is not playing a significant role in determining the relationship between social media practices and other predictors.

Table 3: Confirmatory Factor Analysis (CFA)

Scale	Items	BSN	DC	ENJ	INF	MST	SMP	TR	Alpha
I	DC1	.175	.860	.012	.130	.255	.132	.225	.922
	DC2	.240	.795	.153	.215	-.055	.190	.100	
	DC3	.145	.642	.315	.060	.370	.125	.040	
	DC4	.305	.668	.272	.145	.170	.080	-.238	
II	BSN1	.772	.245	.231	.138	.268	.205	.310	.891
	BSN2	.749	.278	.140	.290	.218	.262	.030	
	BSN3	.635	.255	.260	.185	.390	.220	.050	
	BSN4	.652	.389	.155	.275	.252	.265	-.058	

III	MST1	.310	.305	.240	.135	.775	.172	.175	.909
	MST2	.255	.340	.055	.115	.760	.285	.055	
	MST3	.220	.300	.160	.275	.745	.195	.150	
IV	ENJ1	.135	.305	.760	.148	.365	.470	.235	.851
	ENJ2	.155	.210	.782	.265	.158	.225	.125	
	ENJ3	.120	.370	.615	.125	.230	.305	.260	
V	TR1	.150	.340	.300	.165	.185	.220	.650	.805
	TR2	.245	.110	.090	.270	.005	.075	.780	
	TR3	.070	.160	.080	.245	.160	.225	.880	
VI	INF1	.200	.340	.048	.612	.280	.285	.350	.873
	INF2	.120	.220	.285	.790	.108	.135	.115	
	INF3	.255	.220	.272	.670	.130	.320	.100	
	INF4	.140	.080	.370	.828	.125	.020	.015	
VII	SMP1	.240	.205	.230	.135	.278	.790	.310	.690
	SMP2	.070	.160	.220	.245	.160	.878	.080	
	SMP3	.130	.170	.010	.125	.255	.860	.225	

The results of Table 3 demonstrated that the Confirmatory Factor Analysis (CFA) was applied in SPSS to check the covariance (or correlation) among items, ensuring the validity and reliability of the scale. The Alpha values ranged from the lowest (.690) to the highest (.922), indicating a high-reliability level. Mueller and Hancock (2001) discussed that the main advantage of CFA lies in its ability to aid researchers in bridging the gap between theory and observation. CFA provides valuable insights regarding the fit of the data to a specific, theory-derived measurement model, ensuring only relevant items are loaded while identifying potential weaknesses in specific items.

Discussion

This study showed that digital competence combined with the various gratifications users gain from social media, significantly influences long term social media practices. More importantly, the findings highlight the positive moderating role of digital competence in shaping social media practices, particularly in expanding social networks, maintaining relationships, enhancing enjoyment, relieving tension and fulfilling information needs.

Implications of the Study

This study adds to both national and international literature by demonstrating the positive influence of digital competence on social media practices, particularly on platforms like Facebook, Twitter, LinkedIn and ResearchGate. It emphasizes how scientists can utilize social media features effectively based on their digital competence to meet their specific needs. Additionally, the research highlights the crucial role of digital competence in fostering meaningful social media engagement. In the Pakistani context, this study is especially significant as one of the first to examine the link between digital competence and social media practices among scientists.

Limitations and Future Directions

The findings of this study may not apply to scientists using social media platforms beyond Facebook, Twitter, LinkedIn and ResearchGate, as the research focused on these specific platforms. Additionally, the study is limited to Agricultural Research Scientists at Ayub

Agricultural Research Institute, Faisalabad. Future research could explore other agricultural research institutes and include a wider range of social media platforms to improve the generalizability of the results.

Conclusion

The study examined the impact of digital competence on social media practices across various platforms, including Facebook, Twitter, LinkedIn and ResearchGate. Data were collected from agricultural research scientists of the Ayub Agricultural Research Institute in Faisalabad. The findings revealed that digital competence positively moderates social media practices. Additionally, the study identified a moderate impact of various gratifications such as expanding social networks, maintaining social ties, enjoyment, stress relief and fulfilling information needs on social media practices within these platforms. This research enhances understanding of how individuals with different levels of digital competence engage with social media. Scientists from diverse disciplines can benefit from these findings, using them to develop and promote social media systems that cater to users with varying degrees of digital competence.

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QUESTIONNAIRE

The Impact of Digital Competence on Social Media Practices among Agricultural Research Scientists at Ayub Agricultural Research Institute, Faisalabad: An Analysis using Gratification Theory

Digital Competence Skills

Please check (☐) the most appropriate option

(i) Digital Competence

Sr. #	Statement	To great extent	To moderate extent	To some extent	To little extent	Not at all
1	I am confident in learning and using new features of social media platforms (e.g., Facebook, Twitter, LinkedIn and ResearchGate).					
2	I can use social media tools to articulate and present my research ideas effectively.					
3	I frequently explore and experiment with new features or updates on social media platforms.					
4	I feel capable of sharing my research findings through social media channels.					

(ii) Broadening Social Network

Sr. #	Statements	To great extent	To moderate extent	To some extent	To little extent	Not at all
1	Social media helps me connect with other agricultural researchers.					
2	Social media has expanded my network of professional acquaintances.					
3	Social media enables me to engage with individuals from diverse research backgrounds.					
4	Social media facilitates collaboration with people outside my existing professional circle.					

(iii) Maintaining Social Tie

Sr. #	Statement	To great extent	To moderate extent	To some extent	To little extent	Not at all

1	Social media helps me maintain connections with colleagues and peers.					
2	Social media enables me to stay in touch with researchers I value professionally.					
3	Social media allows me to sustain relationships with national and international researchers.					

(iv) Enjoyment

Sr. #	Statement	To a great extent	To a moderate extent	To some extent	To a little extent	Not at all
1	I find using social media platforms enjoyable in my professional life.					
2	I feel positive when using social media for professional engagement.					
3	I enjoy sharing or consuming research content through social media.					

(v) Tension Release

Sr. #	Statement	To a great extent	To a moderate extent	To some extent	To a little extent	Not at all
1	Social media helps me relax after a long day at work.					
2	Social media use provides me with a distraction from stressful tasks.					
3	Browsing social media helps me take short breaks during my research work.					

(vi) Information Need Fulfillment

Sr. #	Statement	To a great extent	To a moderate extent	To some extent	To a little extent	Not at all
1	Social media helps me discover new research trends in agriculture.					

2	Social media provides valuable information for my research work.					
3	Social media helps me generate innovative ideas for my projects.					
4	Social media contributes to my decision-making in agricultural research.					

(vii) Social Media Practice

Sr. #	Statement	To a great extent	To a moderate extent	To some extent	To a little extent	Not at all
1	I plan to continue using social media actively in my professional life.					
2	I intend to frequently use social media for research purposes in the future.					
3	I find social media an indispensable tool for professional growth.					