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A Cross-Platform Exploratory Study of International and Domestic Scholar Post Engagement on Social Media

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Keywords

social media, audience segmentation, international scholars, Twitter engagement, Instagram engagement

Funding Source

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Abstract

Social media use varies globally across cultures, even within extension services. Recognition of the contributions of international scholars at the universities where they serve also varies. Social media use in international scholars' countries of origin may differ from that of their institution's country, affecting social media engagement with a university's posts featuring international scholars. Using the conceptual framework of audience segmentation, this study explored the differences in social media audience engagement between research themes and international and domestic scholars on Instagram and Twitter. Using a causal-comparative design, this study created Instagram and Twitter posts highlighting peer-reviewed research conducted by both international and domestic scholars at a United States university in a variety of research themes. Separate Instagram and Twitter posts were created for each scholar. Scholars were categorized by research theme and as either international or domestic. Engagement metrics were analyzed descriptively to explore the differences between research themes and international and domestic scholars across Instagram and Twitter audiences. Advances in food science and safety received the highest engagement rate on Instagram, but the lowest engagement rate on Twitter. International scholars received more engagement than domestic scholars in all categories on Instagram. Domestic scholars had higher mean engagements and engagement rates by impressions than international scholars on Twitter, but international scholars received more mean impressions. The results revealed a scholar's research theme and status as either international or domestic may influence the level of social media engagement they receive on a specific social media platform. Recommendations for research are discussed.

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Introduction and Conceptual Framework

Agricultural extension is the outreach and communication arm of universities specifically designed to deliver research results to the public (National Research Council, 1995), though its definition has evolved and thus has been redefined throughout its global history (Shinn et al., 2009), Extension must serve as a "credible and unbiased" (Lindner & Dolly, 2012, p. 3) information source to be effective in its outreach efforts concerning education and research and therefore must strategically communicate with the public audiences they serve (Fitzgerald et al., 2016; Lindner & Dolly, 2012). Strategic communication with stakeholders not only involves communication between extension agents and agricultural producers but necessitates the use of information communication technologies (ICTs) as ability to transfer agricultural information in-person may be limited (Lamm, Lamm, et al., 2019). Social media is one ICT to be considered in strategic communication from research universities supporting extension efforts (Fitzgerald et al., 2016).

Social media are "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" (Kaplan & Haenlein, 2010, p. 61). Social media allow individuals, brands, and organizations to create profiles and connect with other users (Boyd & Ellison, 2007). In 2021, 57% of the world's population used social media (DataReportal, 2021). Due to their widespread public use, social media have been utilized as a communication tool to transfer university-generated knowledge to farmers through extension professionals (Aguilar-Gallegos et al., 2021) and have helped extension agents network with colleagues and promote agricultural policy (Kamruzzaman et al., 2018). While broadly available and frequently used in farmers' households, social media as a source of agricultural knowledge is low in some regions and requires additional research and training for extension practitioners to employ the ICT to its fullest potential (Cahyono & Agunga, 2016; Moonsammy & Moonsammy, 2021). Leveraging social media engagement globally through strategic communications through international scholars may help disseminate evidence-based research information to broader global audience.

International scholars – broadly defined as scholars not born in and without a primary post-secondary degree from the country in which they have the majority of their academic appointment – fill gaps in research or teaching at universities and contribute to universities' rankings and cultural diversity (Altbach & Yudkevich, 2017). Also described as "mobile faculty" (Welch & Huang, 2021, p. 227), international scholars are valued for contributions to universities' globalization and international allure. Universities recruit international scholars with strength in publications, citations, and financial research resources (Yudkevich et al., 2015). However, little research exists about public engagement with international scholar research, necessitating the exploration of their influence on diverse audiences using university-generated information.

Social media use and platform preferences differ globally according to country and culture (DataReportal, 2021). Engagement with social media content can vary across cultures, whether culture is defined by beliefs or nationality (Dobbins et al., 2021). Because social media use may vary between international scholars' cultures, countries of origin, or institution's country, international scholars' appearance on university social media may yield different levels of engagement by platform audience. Engagement data may provide universities with valuable insights on the use of specific social media platforms to strategically amplify research to a global audience. If universities seek to contribute to awareness of research and rankings by increasing

diversity (Altbach & Yudkevich, 2017) and subsequently share agricultural information through extension, it may be beneficial to examine international scholars' role in university social media engagement on various platforms to strengthen audience segmentation for strategic communication.

Due to limited research, there is a need for a proof-of-concept study exploring audience segmentation strategies related to international scholars and social media. Audience segmentation strategically identifies target audience groups most likely to change knowledge, attitude, or behavior for the betterment of society and determining how to communicate with these audiences most effectively (Grunig, 1989; Slater, 1996). Diverse international and sociocultural information sources may garner different levels of engagement based on social media platform used. Examining the role of international scholars and the audiences who interact with them on social media may inform future university and extension communication efforts and ICT strategy. Audience segmentation has been utilized in extension to determine communication channel preferences of clientele based upon demographic characteristics such as education level, age, gender, and occupational level (Carroll et al., 2022; Lamm, Borron, et al., 2019), The framework has also been used to determine the characteristics of extension audiences most likely to engage in sustainable practices such as integrated pest management (Diaz et al., 2020) or water conservation (Warner et al., 2017), emphasizing the importance of creating communication strategies that fit specific needs of diverse audience groups.

Purpose and Objectives

The purpose of this study was to explore the differences in engagement through featuring various research content from international and domestic scholars on a research university's Instagram and Twitter accounts. The study was guided by the following research objectives:

1. Describe levels of social media engagement with various research themes on a college of agricultural and environmental science's Instagram and Twitter accounts.
2. Describe levels of social media engagement with content featuring international and domestic scholars on a college of agricultural and environmental science's Instagram and Twitter accounts.

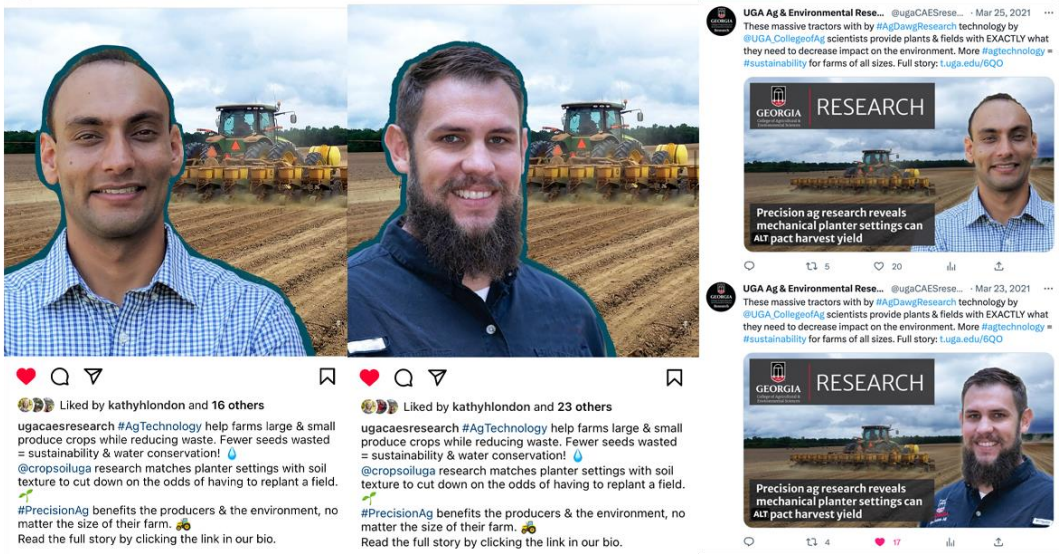
Methods

The exploratory study used a causal-comparative design to produce platform-appropriate social media posts on Instagram and Twitter highlighting research from a United States (U.S.) university's college of agricultural and environmental sciences. For each academic department within the college, researchers identified 12 peer-reviewed journal articles over a period of six months with a goal of publicizing studies in diverse disciplines proportional to the number of peer-reviewed publications occurring in each of the college's five major research themes. Themes, as cited by Fortner et al. (2022), included "(1) *advances in plant sciences*, (2) *advances in animal sciences*, (3) *advances in food science and safety*, (4) *society's role in agricultural and environmental sciences*, and (5) *environmental resource management*" (Gibson et al., 2021, p. 6). This study was part of a larger project to identify differences in social media engagement based upon perceived phenotypic characteristics of researchers (Fortner et al., 2022). To qualify for inclusion in the present study, articles were authored by two or more scientists within the college diverse in discipline and perceived phenotypic appearance (Fortner et al., 2022).

From November 2020, to May 2021, researchers interviewed two or more scientists from each peer-reviewed article and wrote press releases about the articles. Social media posts were made for each scientist featured in the 12 press releases, with 32 scientists featured overall. Two posts, one for Instagram and one for Twitter, were created for each featured scientist and posted on the college of agricultural and environmental sciences research accounts. Posts were formatted for each platform according to social media best practices, including the use of hashtags, captions under 280 characters, and press release links for tweets. Instagram posts used long-form text to explain study results and a prompt to click the *Link in Bio* to read the press release. Each graphic featured an individual headshot of one scientist over a photo relevant to the content and sized for the intended platform (Figure 1). Tweet graphics contained the title of the press release and a college research logo (Figure 1). Posts did not include the scientists' names.

Figure 1

Examples of Tweets and Instagram Posts with Domestic and International Scholars



During the week following press release publication, researchers used HootSuite social media management platform (Hootsuite, Inc., Vancouver, Canada) to schedule the posts for each platform. Scientists were categorized as international or domestic scholars based upon their country of origin and the country of their first academic degree. The study accounted for differences in order-of-appearance engagement levels by varying order of publication based upon researcher classification. For example, if an international scholar's feature was published first for one release, a domestic scholar's post would we published first in the next release. Social media engagement metrics were collected at the end of the six-month study and used to describe differences between scholars and themes. Engagements are measurable responses consumers have with content on social media platforms including reactions, comments, and shares (Barger et al., 2016). For the purposes of this study, engagement rate was calculated using impressions, the number of times a post appears on screen for any platform user (Mui & Ming, 2020), because they are a strong metric determining the social media influence of academic work (Tomblinson et al., 2019). Because this study spanned two platforms, the researchers selected metrics approximately equal across both, with impressions and engagement available for Instagram and

Twitter. Total engagements and impressions were obtained through Instagram Insights (Meta, Menlo Park, California) and Twitter Analytics (Twitter Inc., San Francisco, California).

The study had several limitations. Posts were based upon organic content on active social media accounts. At the campaign's beginning, Twitter had 294 followers; Instagram had 77. Throughout the study, researchers followed social media best practices by following others users and amplifying the content of related accounts to build followership. Upon completion of data collection, Twitter had 358 followers, and Instagram had 300. The growth of these accounts may have influenced engagement rates and should be considered in data interpretation. Second, press release and post content was based upon timely, peer-reviewed college research, resulting in a higher number of international scholars than domestic scholars, which may have affected the results. Third, scientists' existing social media presence was not considered in the study. Finally, this study was strictly exploratory in nature and only begins to delve into the conversation about different audiences through the lens of engagement metrics.

Data were analyzed using descriptive statistics through SPSS 27. Engagement rates by impressions were calculated using the following formula:

$$Engagement\ rate\ by\ impressions = \frac{tweet\ or\ post\ engagement}{impressions\ (100)}$$

Results

To describe levels of engagement with content within identified research themes in a college of agricultural and environmental sciences and between international and domestic researchers, impressions, and engagement rates were identified for 32 Instagram and 32 Twitter posts across various research themes and subject matters (Table 1). Themes consistently received a higher mean engagement rate on Instagram. The theme with the highest mean engagement rate on Instagram was *advances in food science and safety, while advances in animal sciences* received the lowest mean engagement (Table 1). On Twitter, posts within the *advances in plant sciences* theme received the highest mean engagement rate. *Advances in food science and safety* garnered the lowest mean engagement rate (Table 1).

Table 1

Research Themes and Associated Twitter and Instagram Engagement Metrics

Engagement Metric	Research Theme					
	Advances in Plant Sciences (*N = 10)*	Advances in Animal Sciences (*N* = 10)	Advances in Food Science and Safety (*N* = 3)	Society's Role in Agricultural and Environmental Sciences (*N* = 6)	Environ-mental Resource Management (*N* = 3)	Total
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Instagram						
Engagements	21.90 (8.66)	17.60 (6.87)	27.33 (9.02)	19.17 (5.98)	18.33 (3.79)	20.22 (7.48)
Impressions	171.30 (26.14)	161.20 (17.30)	171.67 (13.05)	154.33 (6.22)	133.00 (21.63)	161.41 (21.50)
Engagement Rate (%)	12.44 (3.12)	10.69 (3.21)	15.77 (4.51)	12.47 (4.06)	13.82 (2.37)	12.34 (3.52)
Twitter						
Engagements	36.50 (16.17)	32.00 (15.84)	25.00 (7.21)	39.17 (37.72)	49.00 (45.18)	35.69 (23.41)
Impressions	800.60 (329.94)	912.00 (529.90)	833.33 (280.21)	1021.17 (857.39)	1161.00 (772.22)	913.63 (536.78)
Engagement Rate (%)	4.73 (1.32)	3.69 (1.24)	3.16 (1.06)	4.22 (1.94)	3.93 (1.26)	4.09 (1.41)

Note. N = total number of scholars in the category

Mean engagement with domestic scholar Instagram posts was lower than that of international scholars (Table 2). The Instagram post impressions received by domestic scholars was also lower than international scholars' impressions (Table 2). International scholars garnered a higher engagement rate by impressions on Instagram than domestic scholars (Table 2).

Table 2

Twitter and Instagram Engagement Metrics by Scholar Type

Engagement Metric	Scholar Type			
	International (N = 19)		Domestic (N = 13)	
	M	*SD*	*M*	*SD*
Instagram				
Engagements	22.00	8.73	17.62	4.23
Impressions	165.05	13.14	156.08	13.14
Engagement Rate (%)	13.04	3.91	11.31	2.68
Twitter				
Engagements	34.11	20.53	38.00	27.83
Impressions	921.47	476.27	902.15	635.50
Engagement Rate (%)	3.85	1.50	4.44	1.25

Note. N = total number of scholars in the category.

On Twitter, domestic scholars had higher mean engagements than international scholars. Conversely, domestic scholars had fewer mean impressions than international scholars (Table 2). However, the domestic scholars received a higher mean engagement rate by impressions than that of international scholars (Table 2). International and domestic scholars garnered higher engagements and impressions on Twitter than Instagram, but engagement rate by impressions for international scholars was lower on Twitter (Table 2). On Instagram, posts with international scholars had higher engagement rates by impressions than those with domestic scholars. The opposite was true for Twitter.

Conclusions, Implications, and Recommendations

The purpose of this study was to explore differences between social media engagement with various research themes and between international and domestic scholars within a university's research-based posts on Instagram and Twitter. While exploratory and descriptive in nature, the results revealed differences in engagement across topic area and scholar status on Instagram and Twitter.

The first objective sought to describe levels of social media engagement between research themes in the college. Descriptive analysis revealed on Instagram, *advances in animal sciences* had the lowest mean engagement and engagement rate by impressions, indicating less interest on Instagram for animal sciences research encompassing poultry science, entomology, and animal sciences. *Advances in food science and safety* had both the highest number of engagements and the highest engagement rate on Instagram, indicating particular interest in the subject area. However, on Twitter, *advances in food science and safety* received the lowest engagement and engagement. *Advances in plant sciences* received the highest engagement rate

by impressions, followed by *society's role in agricultural and environmental sciences*. The differences in engagement across platforms and themes indicates audiences respond differently to content depending on the platform they use. Colleges should use this knowledge to strategically publicize research stories according to their associated themes.

The second objective was to describe differences in engagement on Instagram and Twitter when domestic scholars were featured versus international scholars. The findings revealed international scholars tended to receive higher engagement across all Instagram metrics. Twitter audiences were more prone to engage with content featuring domestic scholars in total engagements and engagement rate by impressions, though international scholars did receive more engagements on average. The differences in engagement across platforms could be attributed to a stronger following of international scholars on Instagram and increased recognizability in their work and a stronger following of domestic followers on Twitter. Because engagement with social media varies based upon cultural values (Dobbins et al., 2021), international users may be more likely to engage with content on Instagram. Additionally, performance may have been related to the social media influence of the scientists and their ability to communicate agricultural information and network with colleagues through social media (Kamruzzaman et al., 2018) or the cultural background of the scientist themselves.

The exploratory results revealed the potential for future research to examine cultural nuances of international scholars' platform-specific social media influence along with their research area of expertise. Though international scholars possess potential for globalizing their institution and increasing its educational capacity (Welch & Huang, 2021), their potential for reaching diverse public audiences beyond academia has been previously untapped by extension. Use of social media varies according to cultural background (Dobbins et al., 2021); therefore, future research could create simulated studies in which the demographic and cultural characteristics of social media followers are collected and correlated with international and domestic scholar post interactions. Additional benefit could come from research examining individual scholars' followers on social networks popular among their cultures of origin, while combining this research with an exploration of these scholars' research themes.

Finally, communications professionals in extension may benefit from testing the engagement of featured international scholars and research themes on institutional social media platforms to determine if their dissemination of scientific information increases traffic and interaction with content. Universities should also consider methods to bolster their social media followings with international audiences on the platforms which they find international audiences the most likely to engage and evaluate the effects of these efforts via social media analytics. The resulting findings could inform training needed by extension professionals (Cahyono & Agunga, 2016) when sharing information to relevant global stakeholders based upon audience interests and needs. Finally, an increased understanding of public perceptions surrounding international scholars on social media may empower extension communicators to utilize research professionals to their full potential in delivering information to the global public and the farmers who need research- and evidence-based information most.

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