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Changes in the information uses and gratifications of virtual communications for Kansas State Research and Extension agents during the COVID-19 pandemic

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Changes in the information uses and gratifications of virtual communications for Kansas State Research and Extension agents during the COVID-19 pandemic

Abstract

Kansas State Research and Extension (KSRE) staff have experienced many changes due to the COVID-19 pandemic such as remote work requirements and technology adaptations. The purpose of this study was to determine changes in the use of virtual communications used by K-State Research and Extension agents' internal communications as a result of the COVID-19 pandemic. This study was guided by uses and gratifications theory to understand Extension agents' intensity of use of virtual communications channels for internal communications and the effectiveness of virtual communication channels for workplace communication needs. Through a quantitative Qualtrics survey (n = 99) with a series of side-by-side before and after matrix questions, agents indicated how their intensity of virtual communication use has changed; how their use of virtual communications for work tasks has changed, and how effectively virtual communications satisfied gratifications before the pandemic (March 2020) and two years into the pandemic (July 2022). Our results show before the COVID-19 pandemic, texting was the main channel of virtual communication used to communicate within the office; two years into the COVID-19 pandemic, Zoom, texting, and Microsoft Teams were the virtual communications channels most used by KSRE agents. In July 2022, KSRE agents used virtual communications with more intensity than before the pandemic to obtain information, schedule meetings, share work progress, and maintain communications even when working in the office. Results suggest KSRE support training on Zoom and Microsoft Teams and continued use of and training for evolving virtual communication for internal work collaboration in and out of the office.

Keywords

Extension communication, Uses and Gratifications Theory, COVID-19, virtual communication, Zoom

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Introduction

In late 2019, an unknown version of pneumonia was reported in Wuhan, Hubei Province, China (Ciotti et al., 2020). Genome analysis revealed this to be a novel coronavirus related to SARS-CoV, and it was named severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2. The World Health Organization declared COVID-19 a pandemic on March 11, 2020 (Cucinotta & Vanelli, 2020). The COVID-19 pandemic resulted in significant social and behavioral effects, including mask-wearing, social distancing, and remote work, which have majorly impacted relationships in the workplace, in part, because of how sudden changes were implemented (Kniffen et al., 2021). Changes in the workplace due to COVID-19 looked different depending on workplace demographics such as workplace location, size of company, and leadership structure (Kniffen et al., 2021). COVID-19 was a sudden and unforeseen crisis indicating that many businesses did not have adequate crisis preparedness (Rinn, 2021). Another major change in some industries was mandated work-from-home orders, at least in the early months of the pandemic, to reduce the spread of the virus. According to a Gartner Inc. survey, nearly 50% of organizations had at least 81% remote workers in April 2020, and nearly 40% of employees surveyed were likely to continue to work remotely after the COVID-19 pandemic (Gartner Inc., 2020).

The COVID-19 pandemic impacted Cooperative Extension employees and their working environment during and after the height of the pandemic. Kansas State Research and Extension (KSRE), a network of Extension specialists, agents, researchers, and volunteers who partner with Kansas to solve everyday problems (KSRE, 2022), experienced changes both in work-related structure, tasks, and in agents' needs for personal interaction in the workplace. These professionals strive to improve the lives of Kansas residents by educating, researching, and leading in each of the 105 Kansas counties (KSRE, 2022). Kansas State Research and Extension strives to take university research and disseminate it to Kansas audiences who might otherwise not have that information. KSRE research, programming, and services relate to adult development and aging, community development, crop production, family and child development, family resource management, farm management, horticulture, livestock production, natural resources, youth development, and nutrition, food safety and health (KSRE, 2022).

KSRE followed university guidance on COVID-19 protocol, and staff experienced stay-at-home mandates to work from home from March 2020- August 2020. Mask mandates for KSRE were in place from July 30, 2020, to March 1, 2022. The COVID-19 pandemic added new research foci for KSRE personnel, including a mental health focus (Melgares, 2021) and coping with stress (KSRE, 2022). During stay-at-home orders, it was essential that KSRE professionals use virtual forms of communication for both external and internal communication. Virtual communication is the process of working with a team and interacting with coworkers and colleagues even when at a distance (Indeed Editorial Team, 2021). Virtual communication can allow a more geographically diverse team because employees can reside and work in a different location than the organization. Virtual communication can create effective and efficient work environments by allowing employees to send and receive messages or have video-based meetings wherever they might be. Virtual communications can lead to increased job satisfaction, more collaboration, higher productivity, and cost savings (Indeed Editorial Team, 2021). Types of virtual communications include email, virtual meeting platforms, internet calling, video calling and instant messaging (Indeed Editorial Team, 2021). According to J. Wilson, extension

operations leader for KSRE, prior to the onset of the pandemic, KSRE agents had access to Zoom, but it was not used extensively. During the stay-at-home mandate for KSRE, Kansas State University started using Microsoft Teams in addition to Zoom (personal communication, November 14, 2023).

Purpose and Objectives

The purpose of this study was to better understand frequency and intensity of use of virtual internal communications, as well as the effectiveness of virtual communications to satisfy social gratifications, among KSRE agents both before the COVID-19 pandemic and two years into the pandemic. There is minimal scholarly research in the area of workplace communication changes due to the pandemic. This research adds to literature and understanding of how workplace communication changed within KSRE in order to improve current and future workplace communication in KSRE. Another purpose of this research was to expand on current knowledge about changes in virtual communications related to internal workplace communications. Our research questions were:

Q1: To what extent has KSRE agents' use of Zoom, texting by phone, Skype, Slack, and Microsoft Teams changed as a result of the COVID-19 pandemic?

Q2: Did the intensity of use of virtual communications change in order to satisfy KSRE agents' needs to communicate internal information in the workplace?

Q3: How effectively did virtual communications satisfy KSRE agents' social gratifications in the office before March 2020 compared to two years later (July 2022)?

Theoretical Framework

Uses and gratifications theory (UGT), developed by Blumler and Katz in the 1940s, intends to understand how, why, and with what purpose individuals use the media in their day-to-day lives (Weiyan, 2015). The theory offers insight into how mass audiences can adopt information from television, print, and radio to fit their needs. Uses and gratifications theory was developed to discover the gratifications that attract audiences to the kinds of media and content that will satisfy an individual's psychological and social needs. UGT studies suggest that the audience's role was not a passive one, as previously thought, but a dynamic one (Katz et al., 1974). In the 1970s, UGT researchers maximized attention on what motivated audiences and how they used media to gratify their specific social and psychological needs (Katz et al., 1974). Uses and gratifications theory seeks to explain what motivations audiences have to use media and what gratifications they receive from their use (Temel Eginli & Ozmelek Tas, 2018).

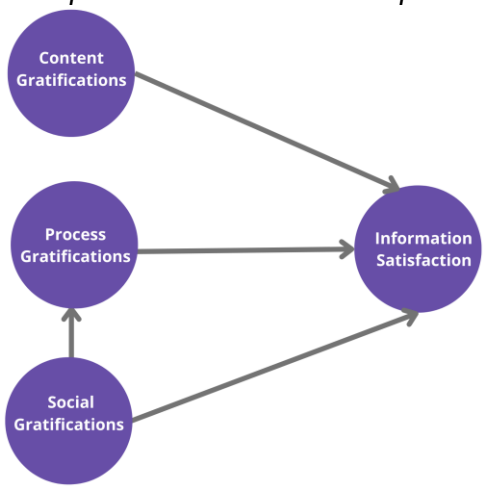
The information uses and gratifications in crisis (IUGC) structural model was constructed to measure consumer gratification pertaining to internet use (Sheetz et al., 2021). This model seeks to understand, through uses and gratifications theory, how process, content, and social gratifications impact information satisfaction. Until this model was proposed, uses and gratifications theory primarily focused on television (Stafford et al., 2004). The IUGC model indicates there is a difference between uses and gratifications during normal situations as opposed to crisis situations and indicates a need for further investigation (Sheetz et al., 2021). "Content gratification is derived from the use of mediated messages for their direct, substantive, intrinsic value for the receiver" (Cutler & Danowski, 1980, p. 269). Mediated messages may be used to gain understanding or knowledge; to change the amount of specific uncertainty in

personal and social situations; or the content might be perceived as useful for the defense of predispositions (Cutler & Danowski, 1980). Process gratification is a gratification solved by the media to pass the time. Process gratification is derived from the use of mediated messages for extrinsic values (Liu et al., 2018). Audiences enjoy gratifications from the sought-after behavior instead of the messaging (Liu et al., 2018). Social gratification is the gratification internet users receive when they use the internet for social means like chatting and interacting with others. "Social gratification starts from interactivity with other parties through media, the interactivity is the degree that users can swap with each other in the media" (Bakar et al., 2014, p. 11).

The IUGC model is represented in Figure 1 and shows that use of content, process, and social gratifications results in information satisfaction. Social gratification alone can result in information satisfaction, but it can also contribute to process gratification. For example, using social media can be a motivation to connect with friends, which connects social gratification to information satisfaction, or it can be used as a way to pass time or entertain oneself, which connects social gratification and process gratification, resulting in information satisfaction (Sheetz et al., 2021) as shown in Figure 1. Our study investigated content gratifications and social gratifications, but we did not investigate process gratifications in an attempt to narrow the scope of this study, to prevent survey fatigue, and to avoid respondent discomfort around questions related to "passing the time" at work.

Figure 1

Recreated Information Uses and Gratifications in Crisis Structural Model



Methods

This study was designed to explore the changes in Kansas State Research and Extension workplace virtual communications from before the COVID-19 pandemic to July of 2022. An online survey, including side-by-side matrices, was developed due to its ease of use, cost efficiency, and ability to reach Extension agents across the state (Dillman et al., 2014). This survey instrument was restructured from established instruments (Moon & An, 2022; Xu et al., 2018) and modified by the authors. The survey was then viewed by a panel of six experts including two agricultural communications professors, one strategic communications professor, one communications professor, one agricultural education professor, and one applied human sciences professor/extension specialist to determine face and construct validity. To establish

reliability, the instrument was pilot tested by Kansas State Research and Extension program assistants, educators, and managers. The pilot group (n = 37) was selected because they were outside of the target audience but in a similar group with similar experiences. The pilot test resulted in 20 responses. A Cronbach's alpha was calculated to establish reliability (Table 1). Cronbach's alpha provides a measure for the internal consistency of a scale or test in a number between zero and one (Tavakol & Dennick, 2011). Acceptable ranges for a Cronbach's alpha start at 0.70 and the maximum possible score is 1.0, and scores can be lower if there are fewer questions or poor inter-relatedness between items (Tavakol & Dennick, 2011). After the pilot, no adjustments were made to the survey except to change titles to KSRE agent instead of KSRE program assistant/manager.

Table 1

Cronbach's Alpha for Instrument Questions in Pilot Group

	Before March 2020			At Survey (July 2022)		
	n	Number of items	Cronbach's α	*n*	Number of items	Cronbach's α
Question 8	18	5	0.90	17	5	0.82
Question 9	17	4	0.94	17	4	0.89
Question 10	17	6	0.7	17	6	0.94
Question 12	17	4	0.89	16	4	0.79
Question 13	17	5	0.82	16	5	0.67
Question 14	16	6	0.93	17	6	0.79

This survey was distributed through direct email via Qualtrics on July 8th, 2022, with four additional reminders sent until July 28th, 2022. Our study population was 222 Extension agents, and we received 99 responses for a 45% response rate. The data was viewed and analyzed through SPSS Statistics. To address research question 1, four questions in the survey asked respondents about their intensity of use of different well-established virtual communications platforms used by Kansas State University and Extension programs (e.g. "Before the COVID-19 pandemic (before March 2020), what forms of virtual communication did you use *less than three times per week/more than twice a week* to communicate within your Extension programming group? (Select all that apply)" and "Since the COVID-19 Pandemic, what forms of virtual communication do you currently use *less than three times per week/more than twice per week* to communicate within your Extension programming group? (Select all that apply)"). We used descriptive statistics to analyze data for research question 1 along with demographic data. To address research questions two and three, we used matrix survey questions that asked participants to respond to prompts like "I used virtual communications such as video calling (Zoom, Skype, Microsoft Teams, etc.) or virtual chat systems (Slack, texting, Microsoft Teams, etc.) to...," then provided a list of items (e.g. "obtain information;" "Schedule remote meetings;" "Keep up with unit events;" "Keep colleagues/coworkers up-to-date with my work progress") with items separated into content versus social gratifications categories. Respondents then answered on a 5-point Likert scale their usage intensity for both "Before March 2020" and "Present". For research question 2, the continuous variable Likert scale for usage intensity was 5=Everyday, 4=Often, 3=Sometimes, 2=Rarely, 1=Never; for research question 3, the continuous variable Likert scale for effectiveness of virtual communications for social gratifications was 5=Strongly Agree, 4=Somewhat Agree, 3=Neutral, 2=Somewhat Disagree,

1=Strongly Disagree or 9=Not Applicable. To analyze the continuous data collected from research questions 2 and 3, we used paired samples t-tests in SPSS to determine any significant change in intensity of use and effectiveness of use before March 2020 and at the time of the survey (July 2022). Paired sample t-tests are commonly used by researchers to determine change in a population by difference in mean when analyzing a set of data from two time periods (Mahbobi & Tiemann, 2015). Survey respondents included 21 males (27.3%), 51 females (66.2%), 2 (2.6%) who preferred to self-describe, and 3 (3.9%) who preferred not to indicate gender. At the time of the survey, zero respondents worked 100% remotely, 58 respondents (75.3%) worked in the office 100% of the time, 7 (9.1%) worked 1-2 days per week from home, 1 (1.3%) worked 3-4 days per week from home, and 11 (14.3%) indicated a different work arrangement.

Results

The purpose of this research was to determine which forms of virtual communications were being used by Kansas State Research and Extension agents for internal communication in the workplace, why they used those forms of communication, and how the uses and gratifications of those virtual communications changed from before March 2020 to July 2022. Results of this study inform KSRE administration on what forms of virtual communication were used internally, as well as how they changed due to the COVID-19 pandemic. This information will allow KSRE administration to facilitate relevant training on virtual communications to inform agents of best practices with each form of communication. It will also allow administration to fortify use of these communications structures to better communicate within the organization.

Q1: To what extent has KSRE agents' use of Zoom, texting by phone, Skype, Slack, and Microsoft Teams changed as a result of the COVID-19 pandemic?

To determine the change in virtual communication used before the COVID-19 pandemic and at the time of the survey (July 2022), participants were asked to select from a list which virtual communication channels they used. Respondents were asked to indicate their frequency of use for each virtual communications channel as "less than three times per week," or "more than twice per week" before March 2020 and at the time of the survey (July 2022). This question measured frequency of use of each virtual communication channel, and how use changed. Table 2 shows an increase in frequency of use for Microsoft Teams, Zoom, and texting by phone. Slack and Skype use increased but were mostly used only one to two times per week. Responses to the "other" option included email (n = 7), social media and voice calling by phone.

Table 2

Virtual Communications Frequency of Use by KSRE Agent Respondents

	Less than three times per week				More than twice per week			
	Before		Present		Before		Present	
	n	%	*n*	%	*n*	%	*n*	%
Zoom	70	70.7	33	33.3	7	7.1	57	57.6
Microsoft Teams	62	62.6	32	32.3	8	8.1	56	56.6
Slack	48	48.5	60	60.6	1	1	2	2
Skype	49	49.5	62	62.6	1	1	1	1

Texting by phone	20	20.2	15	15.2	63	63.6	71	71.7
Other	7	7.1	4	4.0	4	26.3	15	15.2

Q2: Did intensity of use of virtual communications change in order to satisfy KSRE agents' needs to communicate internal information in the workplace?

To determine how virtual communications satisfied agents' needs to communicate in the workplace before and two years into the COVID-19 pandemic, survey participants were asked to respond to a matrix question with the prompt: I used virtual communications such as video calling (Zoom, Skype, Microsoft Teams, etc.) or virtual chat systems (Slack, Texting, Microsoft teams, etc.) to… See Table 3 for items and results from the paired samples t-test. The continuous variable Likert scale for usage intensity was "Everyday (5), Often (4), Sometimes (3), Rarely (2) or Never (1)". Each item had a statistically significant change in mean and a Cohen's d score above 0.8, which shows a stronger power of connection. N values differ on some prompts due to survey dropout or personal refusal to answer. If a participant only answered once for the prompt, either before (March 2020) or present (July 2022), their answer was eliminated to avoid inconsistent data.

Table 3

Information Use Intensity by KSRE Agents for Virtual Communications from Before and Two Years into the COVID-19 Pandemic

	Before (March 2020)		After (July 2022)				
	M_1	SD_1	M_2	SD_2	t	p	Cohen's d
Obtain information (*n* = 70)	2.53	1.13	3.74	0.99	10.74	<0.001	0.95
Schedule in-person meetings (*n* = 70)	2.36	1.19	3.33	1.16	6.97	<0.001	1.17
Schedule remote meetings (*n* = 70)	2.16	10.72	3.61	0.94	12.16	<0.001	1.00
Seek out professional development opportunities (*n* = 70)	2.34	1.17	3.51	1.09	9.39	<0.001	0.98
Keep up with unit events (*n* = 70)	2.34	1.17	3.51	1.09	8.99	<0.001	1.09
Keep my colleagues/ coworkers up to date with my work progress (*n* = 70)	2.06	1.18	3.37	1.18	10.14	<0.001	1.07
Keep my colleagues/ coworkers up to date with my personal life (*n* = 69)	1.83	1.07	2.45	1.17	5.80	<0.001	0.89
Have a record of interactions with a colleague/ coworker (*n* = 69)	1.90	1.14	2.86	1.34	8.01	<0.001	0.99
Share photos and/or videos with colleagues/ coworkers I may no longer see every day (*n* = 69)	1.91	0.97	2.62	1.24	7.16	<0.001	0.82
Make my workflow easier (*n* = 69)	2.04	1.08	3.41	1.20	11.00	<0.001	1.03
Quickly contact colleagues and coworkers for simple information (*n* = 69)	2.26	1.22	3.77	1.14	10.81	<0.001	1.16

Ask colleagues and coworkers complicated questions (*n* = 70)	1.99	1.16	2.99	1.15	8.97	<0.001	0.93
Easily recall information from my colleagues and coworkers (*n* = 69)	2.09	1.13	3.19	1.38	9.00	<0.001	1.02
Provide information on scheduling changes quickly and efficiently (*n* = 70)	2.14	1.06	3.39	1.22	9.73	<0.001	1.07
Have the flexibility to work in a remote or hybrid environment while maintaining easy communication with colleagues and coworkers (*n* = 70)	1.59	0.75	3.27	1.06	13.52	<0.001	1.055

Q3: How effectively did virtual communications satisfy KSRE agents' social gratifications in the office before March 2020 compared to two years later (July 2022)?

To determine how virtual communications satisfied agents' needs for relationship building in the workplace before and after the COVID-19 pandemic, survey participants were asked to respond to a matrix question with the prompt: "Please respond to the next set of statements based on the degree to which you agree or disagree with them." Participants were able to respond on a scale of Strongly Agree (5), Somewhat Agree (4), Neutral (3), Somewhat Disagree (2), Strongly Disagree (1) or Not Applicable (9). Not applicable answers were removed from the data before we ran paired samples t-tests. The omission of "Not Applicable" responses decreased the sample size for the paired sample t-test for this question set. Table 4 shows the results of the paired samples t-test including the mean, standard deviation, t-score, significance, and Cohen's d of each of the prompts. All answers showed statistically significant change ($p<0.001$) *except* for the prompt: "It is easier for me to connect to colleagues and coworkers through in-person interactions than virtual interactions" ($p=0.066$). Each item had a Cohen's d score above 0.8, and t-scores ranged from 1.530-8.884.

Table 4

Effectiveness of Virtual Communications for Social Gratifications Among KSRE Agent Survey Respondents Before and Two Years into the COVID-19 Pandemic

	Before		After				
	M_1	SD_1	M_2	SD_2	t	p	Cohen's d
I feel connected to my colleagues and coworkers through the use of virtual communications systems such as Microsoft Teams, Zoom, Slack, texting or other virtual communications systems (*n* = 51)	2.20	1.13	3.84	1.01	8.88	<0.001	1.32
I feel the relationships with my colleagues and coworkers are deepened by the use of Microsoft Teams, Zoom, Slack, texting or other virtual communications systems (*n* = 55)	2.00	1.11	3.25	1.32	6.82	<0.001	1.36
I think my work relationships are enriched by the availability of Microsoft Teams,	2.12	1.10	3.37	1.21	6.72	<0.001	1.34

Zoom, Slack, texting or other virtual communications systems (*n* = 52)							
I can effectively communicate with colleagues and coworkers through the use of virtual communications (*n* = 54)	2.50	1.26	3.93	1.06	7.74	<0.001	1.35
I feel like I can form relationships with new employees by utilizing virtual communications (*n* = 54)	1.98	1.04	3.24	1.27	7.01	<0.001	1.32
I feel I can form work friendships by using virtual communications (*n* = 54)	1.94	0.92	3.09	1.31	6.45	<0.001	1.31
It is easier for me to connect to colleagues and coworkers through in-person interactions than virtual interactions (*n* = 55)	3.62	1.51	3.91	1.32	1.53	0.066	1.41
It is easier for me to connect to colleagues and coworkers through virtual interactions than in-person interactions (*n* = 52)	1.94	1.16	2.73	1.43	4.26	<0.001	1.33
I feel like I am not alone working remotely when I communicate with my colleagues and coworkers through virtual measures (*n* = 49)	2.45	0.98	3.41	1.14	5.56	<0.001	1.21
I feel like I can effectively communicate surface level topics with my colleagues and coworkers when using virtual communications (*n* = 53)	2.81	1.26	3.96	0.90	6.64	<0.001	1.26
I feel like I can effectively communicate controversial topics with my colleagues and coworkers when using virtual communications (*n* = 51)	1.92	1.11	3.04	1.22	5.91	<0.001	1.35
I can obtain advice and learn from my colleagues and coworkers through virtual communications (*n* = 55)	2.89	1.26	4.07	0.94	7.69	<0.001	1.14
Virtual communications systems such as Microsoft Teams, Zoom, and Slack, are useful tools for communicating within my Extension programming group (*n* = 55)	2.75	1.27	4.07	1.15	7.02	<0.001	1.40
I can keep updated with my employer, colleagues, and coworkers through virtual communications (*n* = 53)	2.81	1.23	4.17	0.89	7.59	<0.001	1.30
I can engage in interesting group conversations through virtual communications (*n* = 53)	2.57	1.28	3.72	1.13	5.79	<0.001	1.45

Conclusions and Recommendations

This study was designed to uncover what forms of virtual communications were used by Kansas State Research and Extension agents within the workplace; how those uses changed as a result of the COVID-19 pandemic; and what gratifications agents experienced from these virtual communications channels. Our research Question 1 was *to what extent has KSRE agents' use of Zoom, texting by phone, Skype, Slack, and Microsoft Teams changed as a result of the COVID-19 pandemic?* Two years into the pandemic, agents' frequency of use of Slack, Skype, and text messaging for work purposes slightly increased, while their use of Microsoft Teams and Zoom for work increased dramatically (7.1% of respondents used Zoom more than twice per week prior to the start of the pandemic versus 57.6% two years into the pandemic; 8.1% used Microsoft Teams more than twice per week prior to the pandemic versus 56.6% two years into the pandemic). While this result may not seem surprising, in July 2022, none of the agents responding to the survey worked remotely 100% of the time, and 75% of them work in the office every day, suggesting that among many, there was a lasting change in Zoom and Microsoft Teams frequency of use regardless of proximity to coworkers.

According to "other" responses, more agents were also using other methods of virtual communications at the time of the survey, such as email, voice calling, and video call by phone, more often than they were before the COVID-19 pandemic. This aligns with previous literature concluding that virtual communications use has increased within a workplace directly in relation to the COVID-19 pandemic (DeFilippis et al., 2022). DeFilippis et al. (2022) analyzed a large sample of metadata consisting of email and meeting data impacted by lockdown orders. DeFilippis et al. (2022) studied how the data varied before and after the lockdown, finding that virtual communications have been used after the COVID-19 pandemic as a way to shorten meeting length and free up time during the day that would otherwise be used for meetings (DeFilippis et al., 2022). While email and marketing data research is informative, it does not go into detail on which virtual communications channels are being used more frequently. Results from our study begin to indicate lasting changes in frequency of workplace virtual communication among Extension agents due to the COVID-19 pandemic, regardless of office versus at-home work location.

Results from our second research question, *did intensity of use of virtual communications change in order to satisfy KSRE agents' needs to communicate internal information in the workplace?* - indicated that agents increased intensity of use of virtual communications for a variety of task-related efforts (for example, scheduling meetings, obtaining information, making workflow easier. Refer back to Table 3 for a full list of items). Using real limits, paired samples t-tests showed that for each question item, agents' self-reported changes in mean indicated a positive and statistically significant trend toward increased agreement in using virtual communication for tasks two years into the pandemic versus prior to the pandemic. Statistical significance in a change in mean indicates that changes are real and tangible, not simply due to chance (Gallo, 2016). In other studies, virtual communications growth has been shown by Zoom video calling, which increased in users across the world from 10 million to 200 million from December 2019 to the onset of the COVID-19 pandemic in March 2020 (Yuan, 2020).

The results of Q2 demonstrated an increased intensity of use of virtual communications when seeking information in the office. The increased intensity of use of virtual communications is striking considering that almost all Extension agents were back in the office full time at the time of the survey (n = 58, 75.3%). Q2's data suggests the adoption of virtual communications

by Extension agents for internal use gained popularity even when agents were back working in the office. Though this may imply a long- lasting trend in increased use of virtual communications for in-person workplace communication, future studies will be needed for confirmation.

Results from our third research question - *how effectively did virtual communications satisfy KSRE agents' social gratifications in the office before March 2020 compared to two years later (July 2022)?* – focused on social gratifications of virtual communications in the workplace rather than information uses (RQ2). Social gratifications items related to, for example, getting advice from colleagues, staying updated with colleagues, and engaging in interesting group conversations with colleagues through virtual communication (refer back to Table 4 for the full list of items). Nearly all items had a positive and statistically significant change in mean, indicating that virtual communications satisfy social gratifications more effectively two years into the pandemic compared to prior to the pandemic. The only item that did not have a statistically significant change in mean was "It is easier for me to connect to colleagues and coworkers through in-person interactions than virtual interactions." This was supported by the July 2022 response to the prompt "It is easier for me to connect to colleagues and coworkers through virtual interactions than in-person interactions," which had the lowest present mean in this set of items (m = 2.73, neither agree nor disagree). It may be a reflection of Extension's long history of successful in-person learning and communication (Conner et al., 2018). Our research results indicate that uses and gratifications related to virtual communications have changed among KSRE agents due to the COVID-19 pandemic, and Kansas State Research and Extension may benefit from engaging in virtual communication where appropriate and as preferred by KSRE agents. KSRE currently offers optional training related to use of Zoom and Microsoft Teams for newly-hired agents (J. Wilson, personal communication, November 14, 2023); we recommend training on these platforms continue to be provided among KSRE agents, as they hire staff fresh out of college who did not experience the COVID-19 pandemic as a working professional. However, KSRE should monitor internal virtual communication uses and gratifications through time, as platforms and use will continue to shift and change.

As recommended by Newman and Ford (2021), it is important to meet teams where they are. The data presented in this study can be used to show when it is appropriate to use virtual communications, or what aspects of work communications teams prefer to keep to traditional in-person communication methods. This data recommends KSRE administration support agents' choice of meeting and communication styles when meeting. One method would be to add communication preferences to meeting schedule requests, such as a poll for date, time, place, and whether it should be in-person, hybrid, or remote. While remote work might not be an option for all KSRE agents, offering virtual meetings could be a convenient change for agents who would otherwise need to travel for a meeting.

Though connection to colleagues via virtual communication in the workplace is becoming easier, we recommended KSRE offer in-person relationship-building opportunities that support agents' preference to make connections in person. We also suggest future research into workplace relationship building and relationship longevity via virtual communication.

Technology availability is an important factor in the workplace to reduce stress and maximize productivity (Morgan & Gore, 2019). Our data shows an increased intensity of use of technology for internal workplace communications, which indicates a need for reliable Internet connections and workplace technology to support virtual communication.

Finally, we did not collect data related to process gratifications, or the gratifications sought to pass the time (Liu et al., 2018). It may be beneficial to study how process gratifications related to virtual communications are incorporated into the work environment, and how they have changed since the COVID-19 pandemic. We also recommend future research focus on changes in gratifications and usage trends for specific virtual communication platforms through time.

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