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Impact of an Extension Social Media Tool Kit on Audience Engagement

Abstract

Extension professionals can improve their use of social media as channels for extending programmatic efforts by maximizing target audience reach and engagement. We describe how implementation of a tool kit highlighting best practices for using social media improved Extension professionals' efforts to engage target audience members via social media. Specifically, we found that after having access to the tool kit, Extension professionals were able to prompt greater participation and engagement from the applicable target audience across three online platforms—Facebook, Twitter, and Pinterest. Our findings indicate that Extension professionals can benefit from learning how to use social media more purposefully and implementing best practices for connecting with audiences.

Keywords: [social media](#), [online engagement](#), [tool kit](#)

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Introduction

For Extension professionals, social media offers a free, digital, direct-to-consumer educational vehicle for delivering evidence-based programming to target audiences. Social media platforms, such as Facebook and Twitter, are powerful tools for extending and enhancing programmatic efforts. In particular, it is becoming increasingly popular for users to access wellness information from the Internet and social media (Jha, Lin, & Savoia, 2016; McCaughey et al., 2014). Therefore, social media is considered a prime mode of communication. Extension professionals should seize on to build healthy communities (Jha et al., 2016).

Using social media for Extension purposes is not a new concept. Social media has been used for connecting with communities and disseminating research- and evidence-based strategies that promote healthful behaviors (Hill, 2014). Using social media, Extension professionals can promote Extension programs for free, conduct real-time

interaction with clientele, and disseminate information to a wider audience than with face-to-face delivery methods (Kinsey, 2010). Newbury, Humphreys, and Fuess (2014) pointed out that many Extension professionals, however, are not fully taking advantage of social media's popularity and relative low cost. Thus, there is still a need for Extension professionals to invest time training in and experimenting with social media to effectively engage their target audiences (Kinsey, 2010). Herein we report on a resource that helps Extension professionals learn about and implement best practices for using social media more effectively.

The Social Media Tool Kit

We were part of a group comprising members of The Learning Child Team, or TLC, and communication and social media specialists at the University of Nebraska–Lincoln who collaborated to evaluate the impact of TLC social media activities for engaging target audience members through Facebook, Twitter, and Pinterest. TLC is a group of University of Nebraska–Lincoln Extension professionals who provide research-based resources, training, and information to adults caring for children up to 8 years old; thus, the target audience for the social media activities was caregivers of young children. To establish a baseline level of performance, beginning in January 2015, TLC collected monthly social media metrics indicating how target audience members were reacting to posts across the three platforms. Social media metrics provide information about engagement, which is commonly measured by aggregating data for behaviors such as target audience members' comments, likes, and sharing of posts. Initial assessment showed that although TLC had been active on social media for some time, overall engagement of the target audience was low.

To increase engagement by the target audience and more effectively share Extension's programming efforts, we developed a social media tool kit and began pilot testing it in August 2015. The tool kit contains tips for and lessons on optimally planning and implementing social media best practices for Extension programs (see Figure 1 for a list of the kit's contents). It not only provides information about "what is best practice" but also gives specific examples and templates regarding "how to implement" best practices. The tool kit was introduced to 10 TLC members during a professional development session. They were encouraged to use the tool kit for disseminating information to the target audience via social media. Social media experts who were involved in the development of the tool kit were available to answer questions from the Extension professionals. The tool kit was shared with the Extension professionals via an email that included a link to where they could download it. (The tool kit is available to download for free at <http://articles.extension.org/pages/73960/social-media-toolkit-for-extension-professionals>.)

Figure 1.

Extension Social Media Tool Kit Table of Contents

N EXTENSION **NEBRASKA EXTENSION**
SOCIAL MEDIA 10-STEP STRATEGY PLANNING

- 1 GOALS**
Why do you want to use social media - how does it fit with your overall organizational goal and why? Do you want to raise awareness, foster relationships, sell something, raise money, inform/educate, entertain?
- 2 AUDIENCE**
Be specific here. Include internal and external audiences; for external audiences, use demographic and psychographic terms. It's likely your audiences may be slightly different for each channel. It's okay to have multiple audiences.
- 3 CHANNELS**
Name each channel separately; then break out objective, audience, how to drive traffic, frequency, content themes, authors and evaluations for each channel.
- 4 OBJECTIVES**
For each of the selected social media channels, list measurable objectives.
- 5 HOW TO PROMOTE YOUR CHANNEL**
How will your audience(s) know you are on these channels? How will you get them to notice you there?
- 6 CONTENT THEMES**
What, specifically, are you posting/sharing and why? Provide examples. Strategies to follow, like, list or share other entities - either internal or external - should be developed and incorporated into the plan.
- 7 FREQUENCY**
How often will you tweet? Post to Facebook? Post new videos? Upload new photos? The trick is to be consistent and to have a plan. Utilizing a weekly or monthly content calendar is helpful.
- 8 CONTENT TEAM**
Who, specifically, is going to find content, create content, post content and monitor your channels? As part of your social media strategy, creating a Content Team is key for your success.
- 9 MONITORING & EVALUATION**
For each of your channels, you will need to take the time for responding to posts/ questions, engaging with community members and taking part in the conversation. And then, how will you evaluate your success for each channel? Your evaluation should cover how you identify if you have achieved your overarching goal(s) and objectives.
- 10 UPDATING YOUR STRATEGY**
How often should you review your social media plan and make adjustments? This can be done weekly, monthly, quarterly, yearly. As you review your success per channel, you should have a plan to review your overarching strategy and make adjustments.

Funding: Nebraska Extension Innovation grant (Dorli) Broadening the Reach of "The Learning Child" (TLC) through Social Media Extension Program Marketing and Evaluation. Staff: Dan (Principal Investigator), Child Health Extension Specialist, Email newsletters, suggestions to @2020@2020. Collaborators: Lisa Primmer-Craft, Terri Durkin, Elise Heermann, Tyler Thomas, Emma Thomas, Haley Blankenhorn, Beaky Allen, Anne Holt & Dan Collins, Extension Educators: Stef Brand, Lisa Pappas, LaDanna Wood, Jocelyn Pappas, Kalia Pisk.

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The tool kit focuses on best practices specifically for Facebook, Twitter, and Pinterest (see Figure 2 for best practices for Twitter as an example), as these platforms are used most often by TLC's target audience (i.e., women aged 25–49 who either have children or are in the childcare or education field). Because individuals in this demographic were already using these platforms to seek information related to child development (Doub, Small, & Birch, 2016; Jane, Foster, Hagger, & Pal, 2015), we focused our efforts on applying best practices for using the platforms to better engage the target audience.

Figure 2.

Extension Social Media Tool Kit Content on Best Practices for Twitter



NEBRASKA EXTENSION TWITTER BEST PRACTICES



TWEETS

- 1. **Connect content with relevant themes.** If there is a trending topic on Twitter, tie in a message that relates. Example: For #NationalGuacamoleDay we found a healthy guacamole recipe, pinned it, and then shared it on Twitter using the hashtag and told people to check out our other pins.
- 2. If you want to share content, tweet content from credible sources, websites such as .edu, .gov and other national and professional organizations.
- 3. If you are a part of Extension events, conferences, or presentations, **tweet during those events** or about them **while you are there**. Share a slide from a presentation that you think will be relevant for your audience, or take a picture posing in front of your poster.
- 4. To enable real-time tweeting, make sure you have the **Twitter app** on your smart phone, tablet or laptop.
- 5. Be a part of the community. **Like other tweets** from relevant accounts to gain followers and trust.
- 6. Use **pictures** (up to four) on Tweets. Tweets with images result in a **26% increase** in clicks.
- 7. Using **empirical language** in tweets. This increases the value and respect for information being provided. E.g. "Research shows" or "A new study from University found"
- 8. Create a **call to action**. Asking to "watch" or "download" increases the likelihood people will complete the action.
- 9. Use **relevant hashtags**. Before using a hashtag, search Twitter for the specific hashtag and see if other results appear. If other relevant results appear, you should include that hashtag in your message and join the larger conversation.
- 10. Mention **people** in the tweets (using the @). Mentioning other accounts creates engagement and makes you stand out.
- 11. When you use the @, unless you are directly replying to someone, **put a period before the @** if it is the first thing in your message. E.g. ".@UNLExtension welcomes new faculty"

FREQUENCY & TIMING

- 1. Tweet about **3-5 times** per day.
- 2. Find **appropriate timing** to tweet for your target audience by thinking about their daily habits and social media use. If you have face-to-face conversations with your audience, it helps to ask them, "when are you usually active on social media?? Once you've been tweeting for a while, review and see which tweets are getting the most engagement and note which times they were shared.
- 3. **Re-share the content multiple times** to analyze and determine the appropriate timing of when your audience is most likely to see the content.

Funding: Nebraska Extension Innovation grant: Grant: Broadening the Scope of "The Learning Child" (TLC) through Social Media: Extension Program Marketing and Evaluation, Dept Dev (Principal Investigator), Child Health Extension Specialist. Email questions, suggestions to dale@unl.edu. Collaborators: Lisa Francis-Castillo, Tonia Durbin, Alice Henneman, Tyler Thomas, Emma Thomas, Haley Greenleaf, Becky Adams, Anne Hede & Dan Corbin, Extension Educators: Carl Smith, Lisa Rippe, LaBerna Wirth, Jackson Fogel, Wade Fife



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As part of pilot testing the tool kit, we were interested in assessing its impact by identifying changes in engagement by the target audience. We hypothesized that by applying the best practices outlined in the tool kit, Extension professionals would be able to effectively use social media to increase target audience engagement.

Data Analysis

We analyzed pre-tool-kit (January–August 2015) and post-tool-kit (January–August 2016) monthly social media metrics for target audience engagement for each platform used by TLC (Facebook, Twitter, Pinterest). We conducted our analysis using SPSS 18.0. Metrics for each platform included aggregated impressions and aggregated engagement of target audience. For the purpose of our study, impressions were defined as the total number of times target audience members saw a post on their feeds. On Facebook, this metric is reported as reach. On Twitter and Pinterest, it is reported as impressions. Engagement is a social media metric commonly used to describe the amount of interaction a piece of content produces. On Facebook, engagement is reported as the likes/reactions, comments, shares, and clicks that posts generate. On Twitter, it is reported as the likes and retweets that tweets generate. On Pinterest, it is reported as saves (i.e., times users save a pin to their boards) and clicks (i.e., clicks to a website from a pin).

Results and Discussion

We first examined the numbers of aggregated impressions generated from content created by the Extension professionals across the three platforms before and after the tool kit was made available for use. We found significant differences in the numbers of Facebook, Twitter, and Pinterest impressions generated before and after release of the tool kit. These results indicated that the numbers of impressions for Facebook, Twitter, and Pinterest significantly increased after the tool kit strategies were implemented.

Next, we analyzed and compared the aggregated engagement metrics from before and after the tool kit was made available. In particular, we looked at the numbers of likes and shares by the target audience on Facebook, the numbers of likes and retweets on Twitter, and the numbers of saves and clicks on Pinterest. We examined mean differences by using paired-samples *t*-tests as the social media impressions were posted by the same Extension professionals before and after the tool kit was used.

Table 1 shows the pre-tool-kit and post-tool-kit means and standard deviations of the social media metrics used in the study, together with the *t*-values from the paired-samples *t*-tests.

Table 1.
Descriptive Statistics and Paired-Samples *t*-Test
Results of the Social Media Metrics per Month

Metric	Pre-tool-kit		Post-tool-kit		Paired samples		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i> -value
Facebook impressions	2,022.38	1,647.24	17,688.88	5,130.02	7.00	7	<.001*
Facebook likes	12.13	14.34	272.38	73.30	9.288	7	<.001*
Facebook shares	7.12	7.86	87.38	29.59	6.442	7	<.001*
Twitter impressions	548.38	414.03	2,2272.25	6,193.81	9.665	7	<.001*
Twitter likes	0.75	1.39	149.75	34.34	12.014	7	<.001*
Twitter retweets	2.00	2.20	104.88	22.81	12.377	7	<.001*
Pinterest impressions	2,267.38	1,798.66	5,848.63	3,662.76	2.715	7	<.05*
Pinterest saves ^a	15.25	18.65	35.37	25.65	1.775	7	.119
Pinterest clicks ^a	41.37	47.95	55.00	38.86	0.663	7	.528

Note. Scores represent aggregated metrics for all content created by Extension professionals over the respective time period (8 months for pre-tool-kit data and 8 months for post-tool-kit data). As such, pre-tool-kit scores represent metrics from January to August 2015 and post-tool-kit scores represent metrics from January to August 2016.

^aAlthough saves and clicks are measures of engagement provided by Pinterest, these

metrics are not directly comparable to engagement on Facebook or Twitter. Pinterest saves are comparable to likes and shares/retweets on other platforms. Although saves data are important for understanding how many users are using Pinterest as a means of getting from a Pinterest board to a website where applicable content is from, in theory a user could save a pin to his or her board as a resource for later and go months before accessing the information—effectively delaying click engagement for prolonged periods of time.

*Significant difference between pre-tool-kit and post-tool-kit data.

We further considered the composition of total engagement by engagement type and platform for the pre-tool-kit and post-tool-kit time periods. As depicted in Figure 3, over three quarters of the total engagement came from Pinterest saves and clicks prior to implementation of the tool kit. After implementation of the tool kit (Figure 4), engagement from Pinterest became the smallest component of total engagement makeup, and Facebook—as represented through shares and likes—accounted for over half the total engagement. Further, the post-tool-kit data indicated a 796.34% increase in engagement overall—629 to 5,638 (Figures 3 and 4).

Figure 3.

Pre-Tool-Kit Engagement by Platform, January–August 2015

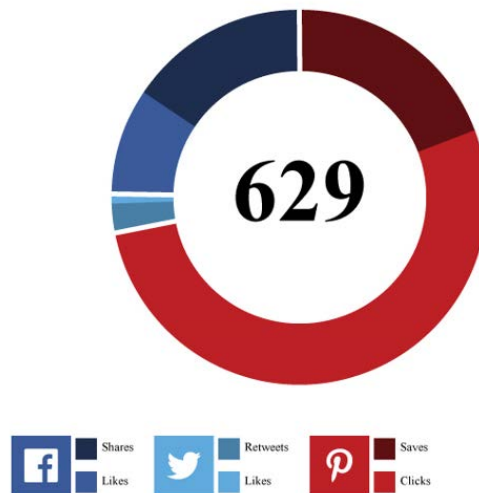
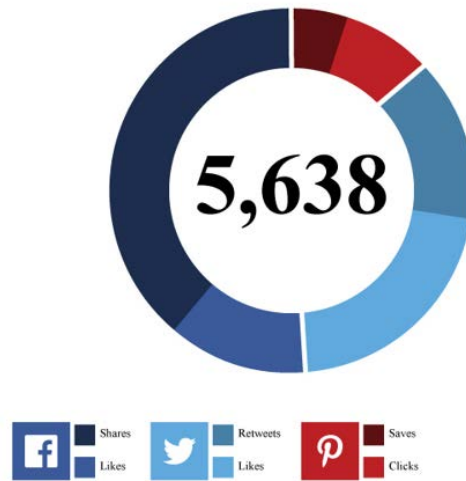


Figure 4.

Post-Tool-Kit Engagement by Platform, January–August 2016



Across all the metrics except Pinterest clicks and saves, there were significant differences in the pre-tool-kit and post-tool-kit data, with the impressions and engagement metrics from after tool kit implementation being significantly higher than those from before tool kit implementation. The results indicate that following TLC members' use of the tool kit, activities on the three social media platforms elicited more interaction from users. Regarding the lack of statistical significance observed between pre-tool-kit and post-tool-kit Pinterest clicks and saves, we suggest that this finding may be attributable to the types of data included in Pinterest's measures of engagement. Although saves data are important for understanding how many users are using Pinterest as a means of getting from a Pinterest board to a website where applicable content is from, in theory a user could save a pin to his or her board as a resource for later and go months before accessing the information—effectively delaying click engagement for prolonged periods of time. Thus, it is possible that the lack of statistical significance in those pre-tool-kit and post-tool-kit data is due to the cataloging and indexing nature of the platform.

We also examined correlations among the impression and engagement metrics to determine whether there was an association between number of impressions for a post and user engagement with the post. Table 2 presents the correlations among all the metrics for the pre-tool-kit data set. We found that in the pre-tool-kit data set there were positive correlations among Facebook impressions, shares, and likes. For Twitter, impressions, likes, and retweets were not significantly correlated. Lastly, Pinterest impressions were not significantly correlated with clicks and saves; however, clicks and saves themselves were positively correlated, which again makes sense due to users' behaviors of saving and later accessing content on their Pinterest boards.

Table 2.
Correlations Among the Pre-Tool-Kit Data

Variable	Variable								
	1	2	3	4	5	6	7	8	9
1. Facebook impressions	—								
2. Facebook likes	.926**	—							
3. Facebook shares	.880**	.733*	—						
4. Twitter impressions	.527*	.325	.446	—					

5. Twitter likes	.274	.134	.188	.110	—			
6. Twitter retweets	.074	-.016	-.172	.457	.700	—		
7. Pinterest impressions	-.538	-.349	-.517	-.113	-.025	-.281	—	
8. Pinterest clicks	-.582	-.393	-.515	-.522	-.227	-.228	.014	—
9. Pinterest saves	-.547	-.427	-.385	-.618	-.389	-.207	-.028	.953**

Note. The dark blue shaded region covers correlation values pertaining to Facebook; the sky blue region covers correlation values pertaining to Twitter; and the red region covers correlation values pertaining to Pinterest.
 * $p < .05$. ** $p < .01$.

Table 3 shows the correlations among post-tool-kit impression and engagement metrics. Facebook impressions were not significantly correlated with shares and likes. Twitter impressions were positively correlated with likes but not retweets. Finally, Pinterest impressions were positively correlated with clicks and saves. Also, it is interesting to note that Pinterest clicks were positively correlated with Pinterest saves and that Facebook likes and shares were correlated but that Twitter likes and retweets were not correlated with each other.

Table 3.
 Correlations Among the Post-Tool-Kit Data

Variable	Variable								
	1	2	3	4	5	6	7	8	9
1. Facebook impressions	—								
2. Facebook shares	.673	—							
3. Facebook likes	.258	.727*	—						
4. Twitter impressions	.513	.659	.326	—					
5. Twitter retweets	.116	.135	.021	.681	—				
6. Twitter likes	.039	.574	.349	.801*	.614	—			
7. Pinterest impressions	.194	.299	-.084	.378	-.174	.295	—		
8. Pinterest clicks	.083	.449	.072	.371	-.232	.492	.898*	—	
9. Pinterest saves	.129	.078	-.317	.213	-.206	.109	.952**	.774*	—

Note. The dark blue shaded region covers correlation values pertaining to Facebook; the sky blue region covers correlation values pertaining to Twitter; and the red region covers correlation values pertaining to Pinterest.
 * $p < .05$. ** $p < .01$.

Although the correlation matrices revealed unique patterns of association among impression and engagement metrics, the majority of the correlations indicate that a greater number of impressions is associated with higher online engagement. This finding implies that consistent and frequent posting is important. This is not to say,

however, that only quantity of posting matters. Our results showed that with the use of the tool kit, which underscores the importance of not only frequency of posts but also curation of meaningful and engaging posts, online engagement metrics generally increased. Thus, we conclude that both quantity and quality of posts are important in encouraging users to engage in social media.

Conclusions and Implications

It is evident from our study that simply using social media for Extension does not always translate to maximum engagement with a target audience. Rather, using a purposeful and well-thought-out approach, with the help of a tool kit for best practices, is more effective for engaging users of social media. Extension educators and outreach professionals from other organizations can benefit from knowing and employing best practices for using Facebook, Twitter, and Pinterest.

Extension professionals should establish a solid presence in social media, through frequent and consistent posting of meaningful and helpful information, in order to draw social media users to engage online. It is particularly beneficial when Extension professionals share, retweet, or save social media posts as doing so widens the audience of the original post. Consequently, there should be an effort within Extension to make posts relevant and foster dialogue among users.

The results reported here should be interpreted in light of the study's limitations. First, because we were focusing only on metrics of engagement and the posts we studied were accessible to the public, we were unable to control for the potentially varied characteristics of the audience. It is possible that certain characteristics of audience members (e.g., individuals who are always using the Internet) may be driving the metrics and confounding the actual effects of the tool kit. Second, we used an 8-month time frame for pre-tool-kit data. Future studies should address a longer time period so that changes in metrics across time are captured. Another limitation is that although we used data sets from two time points, other factors not addressed by the study may have contributed to increased online engagement. As we did not conduct a causal experiment, the increase in online engagement metrics may not be solely attributable to the tool kit. For example, it is plausible that the ever-growing number of users of social media may have simply increased the online engagement metrics. Nonetheless, this circumstance is all the more reason for Extension professionals to use social media as one of their main avenues for communicating information to their target audiences.

As a future direction, we suggest conducting qualitative interviews with Extension professionals to determine the tool kit strategies that were most feasible and effective in engaging target audience members through social media. Conducting survey and focus group research with the target audience to evaluate the effectiveness of the content and mode of delivery (video, blog, newsletter) and future topics of interest would be another way of learning more about the effects of social media activities.

In our study, we observed that the standard deviations of Facebook, Twitter, and Pinterest impressions are very large, suggesting that posting or tweeting is not consistent throughout the year. Thus, we recommend that social media tool kits specifically underscore the importance of consistency in posting content on social media by Extension professionals so that target audiences can rely on Extension social media accounts' being up-to-date and reliable when they need information. We also suggest after seeing the positive effects of using a social media tool kit for Facebook, Twitter, and Pinterest that it would be helpful to investigate how Extension professionals can take advantage of other social media platforms. For example, Instagram, Snapchat, YouTube, and Periscope are growing in popularity. Because these platforms differ in purpose, web interface, and intended online

interactions, future social media tool kits should also include tips on effectively navigating these applications. Lastly, the tool kit was tested for the target audience of adults who care for young children. Knowing the advantages of using a tool kit of best practices, we highly recommended exploring adaptation of the tool kit by Extension professionals working with target audiences in other areas, such as 4-H, beef systems, and crops and water, along with evaluation of its effectiveness in those realms.

Author Note

TLC includes Gail Brand, Lisa Poppe, Ruth Vonderohe, Leslie Crandall, LaDonna Werth, Katie Krause, Jaclynn Foged, Leanne Manning, Sarah Paulos, Lynn DeVries, and Linda Reddish.

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References

- Doub, A. E., Small, M., & Birch, L. L. (2016). A call for research exploring social media influences on mothers' child feeding practices and childhood obesity risk. *Appetite, 99*, 298–305. <http://doi.org/10.1016/j.appet.2016.01.003>
- Hill, P. (2014). "Connecting" with your clients [on Facebook]. *Journal of Extension, 52*(2), Article 2COM2. Available at: <https://joe.org/joe/2014april/comm2.php>
- Jane, M., Foster, J., Hagger, M., & Pal, S. (2015). Using new technologies to promote weight management: A randomised controlled trial study protocol. *BMC Public Health, 15*(1), 509. <http://doi.org/10.1186/s12889-015-1849-4>
- Jha, A., Lin, L., & Savoia, E. (2016). The use of social media by state health departments in the US: Analyzing health communication through Facebook. *Journal of Community Health, 41*(1), 174–179. <http://doi.org/10.1007/s10900-015-0083-4>
- Kinsey, J. (2010). Five social media tools for the Extension toolbox. *Journal of Extension, 48*(5), Article 5TOT7. Available at: <https://joe.org/joe/2010october/tt7.php>
- McCaughey, D., Baumgardner, C., Gaudes, A., LaRochelle, D., Wu, K. J., & Raichura, T. (2014). Best practices in social media: Utilizing a value matrix to assess social media's impact on health care. *Social Science Computer Review, 32*(5), 575–589.
- Newbury, E., Humphreys, L., & Fuess, L. (2014). Over the hurdles: Barriers to social media use in Extension offices. *Journal of Extension, 52*(5), Article 5FEA1. Available at: <https://joe.org/joe/2014october/a1.php>

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