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This paper examines how public libraries can best use social media as a marketing tool, specifically focusing on Facebook. Data was collected from 30 public library Facebook pages on number of posts, number of comments, and number of likes received during a two month period. This data was used to create a model that could fairly accurately predict how many likes a public library's Facebook page would receive based on several factors. Findings of this study suggest that a public library can effectively cultivate public interest through social media by posting to social media sites frequently, allowing for comments on social media sites, and posting about career achievements of current staff members.

Headings:

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SOCIAL MEDIA AS A MARKETING TOOL FOR PUBLIC LIBRARIES

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Introduction

Marketing has long been an important area of interest for public libraries. It is a way for libraries to demonstrate their value and make the public aware of the many purposes that they serve. The use of marketing strategies can attract more users to libraries by publicizing their materials and services, which in turn improves their visibility and image. However, marketing can be expensive, and as public libraries face continued budget cuts, it has become increasingly difficult to find economically efficient ways for libraries to advertise. One solution to this problem is the use of social media as a marketing tool. The emergence and rise in popularity of social media has expanded the possibilities for libraries to market themselves. Social media sites are free to use and allow for libraries to promote their material, services, and overall usefulness in an interactive environment that is frequented by the general public. Thus using social media can be an economical marketing method that lets libraries advertise their services and offerings while engaging directly with current and potential patrons.

This study looks at how effective public libraries are at cultivating public interest through the use of social media. Specifically, this study will examine the relationship between user interaction and public library use of social media sites. Models were created to determine what factors led to higher levels of patron interaction with public libraries on social media sites. This study was carried out by analyzing the use of social media for marketing purposes by public libraries in North Carolina.

Literature Review

There have been several studies related to library use of social media for marketing purposes. In looking at interactive content on library websites, including many public libraries, Chua and Goh (2008) found that library use of social media services forged personalized connections with users. Additionally, they found that the presence of interactive applications correlated to the overall quality of library websites. Chua and Goh specifically suggested that the social media site Facebook may help improve the perceived quality of a library's website.

Breeding (2010) discusses the numerous advantages that libraries can take advantage of by using social networking, as such activity sparks higher levels of engagement with library users. He also claims that such use of social media has become standard for almost any organization as a means to promote its message, products, or services. Additionally, he views social networking as part of library marketing initiatives, as it provides opportunities for exposure and increases activity for libraries both within physical facilities and through Web presence.

In an analysis of public library use of interactive Web 2.0 tools, Peters (2011) found that social media is one of the most popular Web 2.0 tools among public libraries. She found that Twitter and Facebook were the most commonly used social networking sites among public libraries, and that announcing library events and sharing photographs were the main ways in which the sites were used. Peters determined that social media

sites were popular among public libraries because they are widely used by patrons, they have a large number of functions, and they are free for both the library and patrons to use.

Some studies have examined libraries using specific social networking platforms, most notably Facebook. Xia (2009) studied library usage of Facebook groups as a means of marketing library services. He found that groups that focused on broader topics about the library stayed more active than groups that had more specific focuses. Xia also argued that libraries are able to connect with library users by constantly announcing new library services and events and notifying members of new books. Though he viewed social media as similar in function to many other library outreach initiatives, Xia put forth that marketing through social media is more casual and “fashionable” than other methods.

In a study of how college and university libraries use Facebook to connect with their students, Graham et al. (2009) found that the most popular use of Facebook among college and university libraries was to promote or advertise events within the library. The study also raised the question of how to measure the success of a library’s Facebook initiatives. Number of friends/likes, number of questions answered, and number of times a page has been updated were all suggested as possible ways to measure the success of using Facebook.

Jacobson (2011) conducted a study on perceived use compared to actual use of Facebook as a library tool. Her findings concluded that if a library cannot commit to updating its Facebook page at least once a week or more, it may not be a very useful or successful tool. She also found the Facebook’s top use among libraries is for announcements and marketing. Thus she concluded that it is a better tool for libraries

that host many events, exhibits, workshops, and other activities than those that do not host a relatively large number of such events. Jacobson cautioned that librarians should not get too attached to Facebook, as the next popular tool may not be far away because of the Internet's constantly changing nature.

Aharony (2010) found that there is little difference between the ways that public libraries and academic libraries use the social media site Twitter. He found that both types of libraries use the tool as a channel of communication with library patrons and both try to produce at least one tweet every day. He also found that public libraries most frequently tweet about events and use informal language.

Though there are some exceptions, it is clear that library use of social media has largely revolved around the use of Facebook. This is likely due to the social media site's immense popularity. According to a Pew study (2012), Facebook is currently the most popular social media site among Americans. The study found that 66 percent of adults who use the Internet use Facebook. Meanwhile, no other social media sites (such as Twitter, Pinterest, Instagram, and Tumblr) are used by more than 16 percent of American adults who use the Internet.

Methodology

To study how effective public libraries are at cultivating public interest through the use of social media sites as marketing tools, the Facebook pages of public libraries in North Carolina were analyzed. This social media site was chosen because it is currently the most widely used social media site. North Carolina was selected as a state because of the author's familiarity with the state's public library system. Additionally, North Carolina offers a diverse range of public library patron-bases, as the North Carolina Office of State Budget and Management shows that there are public libraries in poor locations, wealthy locations (2008), highly populated locations, and sparsely populated locations (2013). Such demographic factors allowed for the study to cover public libraries that have a wide variety of resources and services.

This study focuses on public library use of the social media site Facebook. In this study, a person who has an account on Facebook is called a "user." Because a library is an entity, it cannot be a user of Facebook. Instead, libraries, companies, organizations, and other entities have what are called "pages." A page is very similar to a user, with the main difference being that users can agree to become "friends" with other users, but pages cannot. Instead, users can "like" pages, which is roughly equivalent to being friends with the page. Because of the prevalence and the multiple functions of the word "like" on Facebook, for the purposes of this study a user that likes a page is called a "follower" of that page. The location on Facebook in which a user or a page posts

messages, pictures, and other content (which are called “posts”) is referred to as the “timeline.” On a timeline, a user or page can transmit direct responses to posts, which are called “comments.” Users and pages can also choose to express their approval of a post or comment. Such an expressed approval is called a “like.”

For the purpose of this study, patron interest is determined by the number of likes received on Facebook.

In this study, all known Facebook pages of North Carolina public libraries were located. The Facebook pages were located through the State Library of North Carolina’s Public Library Listing (2013) and by browsing the website of every public library in North Carolina. It was determined that there are 60 public libraries in North Carolina that have Facebook pages.

For Facebook pages, all posts from January 1, 2013 through February 28, 2013 were examined. In order to get an appropriate sample size of this data, a simple random sample of 30 of the 60 library Facebook pages was created. For each of the Facebook pages in the sample, the number of posts, comments, and likes received during the time period were recorded.

To determine how public libraries can best cultivate public interest through the use of social media for marketing purposes, several models were created to predict what situations will lead to users liking a library’s post. It was decided that receiving a like is the best measure of public interest because a like indicates that a user approves of what the library is communicating. Meanwhile, a comment may not necessarily be positive, and thus it is not as good of an indicator of patron approval as a like is. Also, any one person can make multiple comments on a post, but an individual can only like a post one

time. Because of this, likes can be seen as a more wide-reaching indicator of patron interest than comments.

Results

Library	Likes	Posts	Comments
Bladen County Public Library	46	17	2
Braswell Memorial Library	4	10	1
Cabarrus County Public Library	13	10	3
Carteret County Public Libraries	4	9	6
Catawba County Library System	97	101	10
Chapel Hill Public Library	75	45	21
Cumberland County Public Library	515	66	56
Durham County Library	193	40	13
Edgecombe County Memorial Library	3	2	0
Fontana Regional Library	408	79	36
Forsyth County Public Library	149	28	40
H. Leslie Perry Memorial Library	6	8	1
Hickory Public Library	42	84	4
High Point Public Library	109	59	7
Lexington Public Library	7	3	3
Mooreville Public Library	61	7	18
New Bern-Craven County Public Library	57	15	9
Pasquotank-Camden Library	3	51	0
Perquimans County Library	55	15	7
Randolph County Public Library	168	81	19
Robeson County Public Library	59	21	4
Rowan Public Library	30	18	2
Scotland County Memorial Library	28	20	2
Shepard-Pruden Memorial Library	196	49	6
Thomasville Public Library	13	12	1
Tyrrell County Library	0	1	0
Union County Public Library	76	18	12
Wake County Public Libraries	707	60	1815
Watauga County Public Library	196	35	22
Yancey County Public Library	70	23	13

Figure 1: Table of data collected from each Facebook page

Data from the Facebook pages of public libraries was gathered manually and entered into an Excel spreadsheet. Figure 1 shows the data that was collected on the 30 public library Facebook pages, including library name, posts, likes, and comments from the period between January 1, 2013 and February 28, 2013.

The data from Figure 1 was used to create several regression models with the Excel Data Stat Pack, with the intent being to create a model that could fairly accurately predict what a library could do to get more likes. The first model that was created used posts as the independent variable, and likes as the dependent variable. This would mean that the more frequently a library posts, the more likes it will receive. As is in Figure 2, this model produced a very poor correlation, as the R^2 value was 0.29, indicating that only 29 percent of the variation in likes can be explained by the number of posts.

SUMMARY OUTPUT

<i>Regression Statistics</i>				
Multiple R	0.53			
R Square	0.29			
Adjusted R Square	0.26			
Standard Error	140.23			
Observations	30.00			

<i>ANOVA</i>				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	1.00	219484.95	219484.95	11.16
Residual	28.00	550593.05	19664.04	
Total	29.00	770078.00		

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	11.30	39.78	0.28	0.78
Posts	3.09	0.93	3.34	0.002

Figure 2: First Facebook Regression Model Statistics

Because the regression model was so poor, another model was made in which the dependent variable was still likes, but with both posts and comments as the independent variables. This would mean that the more posts and comments a library has on its Facebook page, the more likes its posts will get. As can be seen in Figure 3, the R^2 value of this model was 0.67, meaning that 67 percent of the variation in likes could be explained by the number of posts and the number of comments. While this was better than the first model, it was still not as high as desired. However, the model had t-stat values of 3.61 for posts and 5.59 for comments, both of which are significant at the 95 percent confidence interval. Thus, it is extremely unlikely that the correlation between number of likes and the number of posts and comments was caused by random chance.

SUMMARY OUTPUT

<i>Regression Statistics</i>				
Multiple R	0.82			
R Square	0.67			
Adjusted R Square	0.64			
Standard Error	97.22			
Observations	30.00			

ANOVA				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	2.00	514885.56	257442.78	27.24
Residual	27.00	255192.44	9451.57	
Total	29.00	770078.00		

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	12.99	27.58	0.47	0.64
Posts	2.36	0.65	3.61	0.001219718
Comments	0.31	0.06	5.59	6.2633E-06

Figure 3: Second Facebook Regression Model Statistics

While this model was decent, it was not as accurate in predicting likes as was desired. As can be seen in Figure 4, the model was particularly poor at predicting the number of likes received by the Facebook pages for Cumberland County Public Library and Fontana Regional Library.

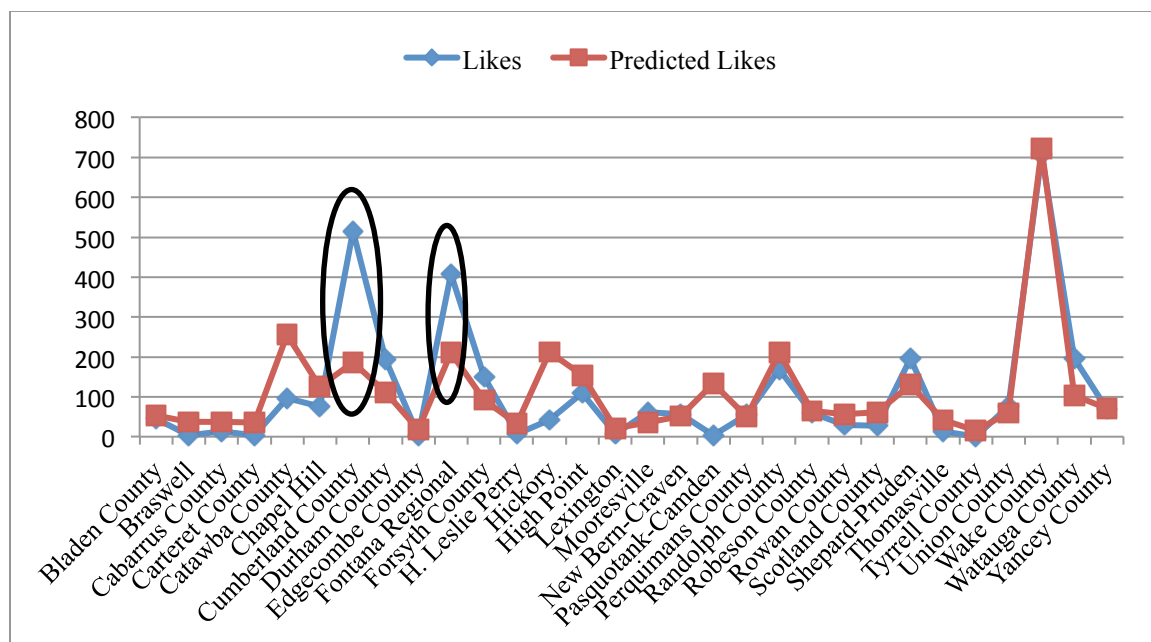


Figure 4: Chart showing Actual Likes (blue) compared to Predicted Likes (red) as determined by the second Facebook regression model. The circled points show the large disparity between actual likes and predicted likes for the Facebook pages of Cumberland County Public Library and Fontana Regional Library.

In re-examining the Facebook pages for these two libraries, it was discovered that both libraries had received a large number of likes on posts that were about career achievements of current staff members, something that no other library in the sample had posted about. The Facebook page for Cumberland County Public Library received a combined 67 likes on two posts about staff members being promoted, which accounted for approximately 13 percent of the total number of likes the Facebook page received during the time period. A post about a staff member's fortieth anniversary of working at

the library on the Facebook page for Fontana Regional Library received 119 likes, which accounted for approximately 29 percent of the total number of likes the Facebook page received during the time period. It was determined that the model should take into consideration whether or not a library posted about career achievements of current staff members because such posts accounted for a large percentages of the likes for the libraries that had done so.

To improve the model, a categorical variable was created in which a 1 indicated that a library had posted about career achievements of current staff members, while a 0 indicated that a library had not posted about career achievements of current staff members. This categorical variable was labeled as “staff news.” As is seen in Figure 5, this model was much more accurate than the previous models. Its R^2 value of 0.9 indicates that 90 percent of the variance in likes can be explained by number of posts, number of comments, and the presence of posts about career achievements of current staff members. The model had t-stat values of 2.84 for posts, 10.55 for comments, and 7.55 for staff news, all of which are significant at the 95 percent confidence interval. Thus, it is extremely unlikely that the correlation between the number of likes and the number of posts and comments and the presence of posts about career achievements of current staff members was caused by random chance.

SUMMARY OUTPUT

<i>Regression Statistics</i>				
Multiple R	0.95			
R Square	0.90			
Adjusted R Square	0.88			
Standard Error	55.46			
Observations	30			

<i>ANOVA</i>				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	3.00	690096.65	230032.22	74.78
Residual	26.00	79981.35	3076.21	
Total	29.00	770078.00		

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	28.73	15.87	1.81	0.08
Posts	1.15	0.41	2.84	0.01
Comments	0.34	0.03	10.55	6.89023E-11
Staff News	333.49	44.19	7.55	5.18408E-08

Figure 5: Third Facebook Regression Model Statistics

The model's coefficients are included in Figure 4. The intercept is 28.73, the coefficient for posts is 1.15, the coefficient for comments is 0.34, and the coefficient for staff news is 333.49. Thus the model predicts likes by adding together the number of posts times 1.15, the number of comments by 0.34, the presence of staff news by 333.49, and the intercept value of 28.73. Essentially, the model shows that each post is worth 1.15 likes, each comment is worth 0.34 likes, and the presence of staff news is worth 333.49 likes. The accuracy of the model can be seen in Figures 6, 7, and 8. Figure 6 is a Pearson's Product Movement Correlation table, which shows that the independent variables have a strong correlation to the dependent variable, but do not correlate with

each other. This means that each independent variable adds to the model, as is confirmed by the t-stat values. Figure 7 is a chart that graphs the predicted likes for a Facebook page against the actual likes it received. Comparing Figure 7 with Figure 4 demonstrates the third model's superiority to the second model. Figure 8 provides a listing of the actual likes a library received during the time period, and the number of likes that the third model predicted it would receive during the time period.

	<i>Likes</i>	<i>Posts</i>	<i>Comments</i>	<i>Promotions</i>
Likes	1			
Posts	0.533869	1		
Comments	0.713012	0.198526	1	
Promotions	0.581342	0.382493	-0.0207	1

Figure 6: Pearson's Product Movement Correlation table for the third Facebook model

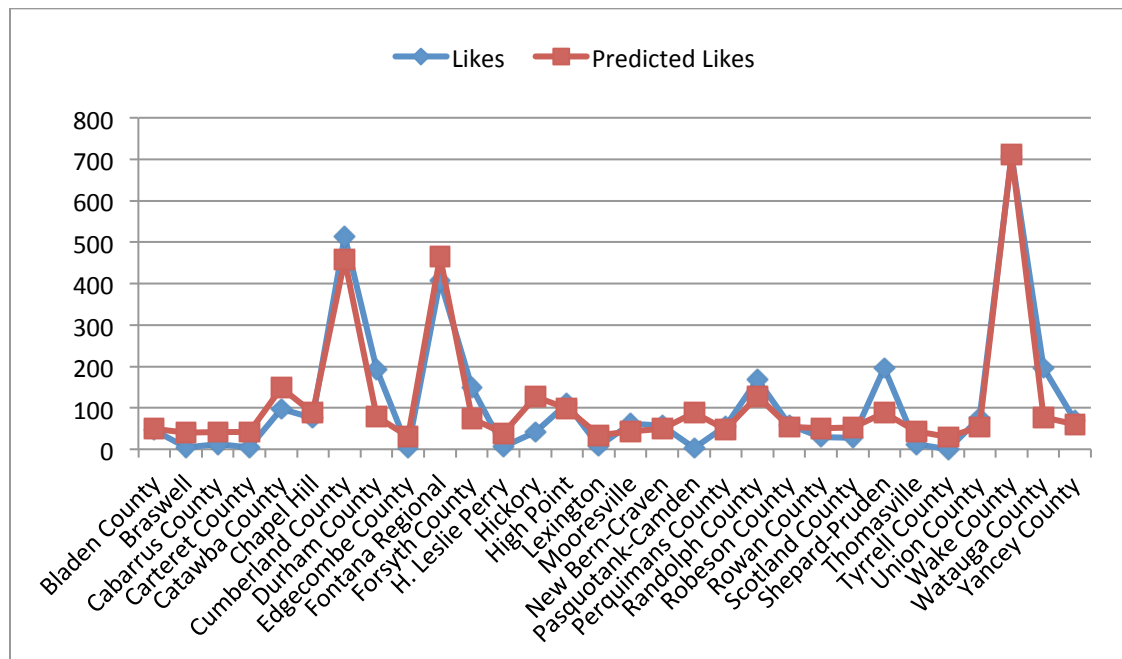


Figure 7: Chart showing Actual Likes (blue) compared to Predicted Likes (red) as determined by the third Facebook regression model

Library	Actual Likes	Predicted Likes
Bladen County	46	49
Braswell	4	41
Cabarrus County	13	41
Carteret County	4	41
Catawba County	97	149
Chapel Hill	75	88
Cumberland County	515	457
Durham County	193	79
Edgecombe County	3	31
Fontana Regional	408	466
Forsyth County	149	75
H. Leslie Perry	6	38
Hickory	42	127
High Point	109	99
Lexington	7	33
Mooreville	61	43
New Bern-Craven	57	49
Pasquotank-Camden	3	88
Perquimans County	55	48
Randolph County	168	129
Robeson County	59	54
Rowan County	30	50
Scotland County	28	52
Shepard-Pruden	196	87
Thomasville	13	43
Tyrrell County	0	30
Union County	76	54
Wake County	707	712
Watauga County	196	77
Yancey County	70	60

Figure 8: Table showing actual likes compared to predicted likes for each library as determined by the third Facebook regression model

Discussion

To cultivate patron engagement on social media sites, public libraries must understand the best ways to engage with patrons in the context of social media. It is clear from the third regression model that there are several factors that can cause users to like posts on a public library's Facebook page. A combination of posts, comments, and the presence of staff news all play a role in the number of likes a library's Facebook page will receive. While the model did not perfectly predict the number of likes that every public library Facebook page received during the observed time period, it is useful in determining what factors led to higher levels of patron interaction with public libraries on Facebook.

The regression model demonstrated that there is a positive relationship between number of likes and number of posts. However, there is a higher correlation between number of likes and number of posts and comments. Perhaps the most interesting thing that can be taken from the model is the impact of posts about career achievements of current staff members. In the third and most accurate regression model, the presence of posts about career achievements of current staff members equated to an additional 333 likes. Of course, the variable is based on a small sample size of only two library Facebook pages that included such posts.

Despite the small sample size, it can be speculated that, in general, patrons like to read good things about library employees. If a person is a follower of a library's

Facebook page, it is reasonable to assume that they frequent the library and know the employee who has been posted about. Another interesting aspect to these posts is that each one included a picture of the employee being posted about. This seems to be a best practice, as it likely helps patrons place a name with a face, as patrons may not actually know the name of a staff member even if they have routine interactions with the staff member at the library.

Initially, this study was also going to look at how libraries could best engage with patrons on Twitter. However, several problems arose, the largest of which was a lack of data. Only 19 active and accessible public library Twitter accounts could be located, which is a very low number compared to the 60 public library Facebook pages that were located. Of the 19 Twitter accounts, only 12 accounts could provide the data required for any significant amount of analysis. Unfortunately, no useful correlations could be found in the data that was collected from the 12 Twitter accounts. This was likely due to the small sample size. Since so few public libraries in North Carolina have Twitter accounts, it appears that at this time most libraries in the state do not view it as the best form of social media to interact with patrons on. It is possible that public libraries do not tend to use the site because they do not feel that a large portion of their patrons use Twitter. As was previously stated, Facebook is much more widely used than Twitter. Additionally, Facebook may be seen as the preferable format since it is not as restrictive as Twitter, which limits messages to 140 characters.

Another issue that is going to be important regardless of medium is advertising a social media account. Patrons cannot connect with a public library via social media if they are not aware that the library has a social media account. Thus it is necessary for

libraries to ensure that their social media accounts are advertised to their patrons. This can be accomplished through any number of means including signs, banners, and fliers. Reminding patrons to visit the library's social media account as they check out their materials is another way to promote the library's social media presence. One other possible way to advertise a social media account is to print bookmarks that contain the account's URL.

One important issue to consider is that social media is constantly changing. While Facebook is the most popular social media site today, it may become obsolete in the future. And even if its popularity does persist in the future, it is sure to undergo numerous changes, rendering the current version of the site unrecognizable. For example, the Facebook timeline is a relatively recent invention. Because of social media's penchant for constantly changing, it is necessary to not focus on the specific technology of social media but to instead pay attention to general themes. It is apparent in the model that frequent activity on social media sites is necessary. Though not as important as frequent activity, the ability to comment on items posted by the library is valuable to users. Also, patrons seem to be particularly interested in the human aspects of public libraries, as is evidenced by the popularity of posts about career achievements of current staff members. The knowledge that patrons enjoy reading such information can persist through the ever-changing world of social media.

Conclusion

While marketing is always an important task for a public library, it has become increasingly important as libraries face budget cuts and closings. Now, more than ever, public libraries must demonstrate their value and importance to their communities, and marketing is one way to accomplish this. Marketing also helps increase public awareness of all that libraries have to offer. Of course, marketing can be very expensive. One economically efficient way to market a library's many services and materials is to engage with users through social media. Social media allows for libraries to directly reach current and potential patrons, as many Internet users have social media accounts. Not only are current and potential library users already on social media, but there are no direct costs in reaching them as virtually every social media site is free to use.

Because social media presents such a great opportunity for public libraries to market themselves, it is important to understand how libraries can best cultivate public interest via social media sites. Currently, Facebook is far and away the most popular social media site. The findings in this study indicate that users who follow the Facebook pages of public libraries respond most positively to a combination of frequent posts, comments on posts, and posts about career achievements of current staff members. While Facebook may fall out of favor, the results of this study can be useful for public libraries using any type of social media, as the models say as much about the way users interact with public libraries on social media sites as it does about how to get likes on Facebook.

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