MEASURING SOCIAL MEDIA ACTIVE LEVEL (SMACTIVE) AND ENGAGEMENT LEVEL (SMENGAGE) AMONG PROFESSIONALS IN HIGHER EDUCATION

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ABSTRACT

Introduction: Social media (SM) has gained rapid adoption and provided new opportunities for communication. This study pilot tested a suite of SM use indexes to better measure and quantify the active and engagement levels for improved teaching and learning. An online survey was administered to an adult sample in higher education settings (n=372). Four major SM platforms were examined: Facebook, LinkedIn, Twitter, and YouTube. Six SM indexes were developed, with three assessing how active a person is in using SM, one measuring the likelihood of SM adoption, and two measuring engagement levels. The results demonstrated satisfactory internal consistencies. All indexes showed positive and clear linear correlations with participants' view towards SM, demonstrating strong (criterion) validity (all $p < .001$). The findings also showed strong scale discriminant validities between early versus late adopters. This study provides a validated measurement tool to better describe how people have used SM and quantifies SM active and engagement levels.

Keywords: Social Media, Engagement, Measurement Validation, Higher Education

INTRODUCTION

The Rapidly Growing and Graying Social Media Era

Social media has become a major mode of sharing and communicating information and has become an integral part of many people's lives in the U.S. Currently the top four social media sites for the marketing industry are Facebook, Twitter, YouTube, and LinkedIn (Stelzner, 2015). These major social media sites have grown rapidly since their inception and have drastically changed the way people communicate and interact today. According to the "Social Media Usage: 2005-2015" study conducted by the Pew Research Center, over 65% of today's American adults use social media, a nearly tenfold increase since 2005 (Perrin, 2015). Even the generational gap in the use and adoption of social media is becoming blurred. The older generation is not only engaged in Internet use but also actively using social media. Data show that, although young adults still represent the largest group using social media (over 90%), those aged 65 years and older represent the new fastest growing adopter group, with over 35% using social media today (Perrin, 2015). Data show that, for the first time, more than half of all online older adults age 65 and older (56%) use Facebook (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015). The increasing accessibility and adoption of social media is penetrating all age groups. As we enter the rapidly changing and growing social media era, educators and researchers must reconsider how to leverage the power of the Internet and social media for communicating information to improve teaching and learning in higher education.

Existing Measurement Tools to Assess Social Media Use

Several emerging measurement tools have been developed to examine how active or engaged people are in the various social media activities among major social media platforms. Our review of the existing studies showed that many researchers have assessed social media or technology use in terms of time spent (hours or minutes) per day, duration of usage, or frequency of use (Stelzner, 2015; Duggan, et al., 2015; Junco, 2012; Thompson, 2013; Hou, S., Hsiao, & Hou, P.H., 2012). Some expanded the study of usage to also include attitudes or beliefs towards the use of the Internet and technology (Jenkins-Guarnieri, Wright, & Johnson, 2013; Hou, S. & Hou, P., 2013; Rosen, Whaling, Carrier, Cheever, & Rokkum, 2013), or emotional connection with social media (i.e. Facebook) use (Ellison, Steinfield, & Lampe 2007; Ross, et al., 2009, Jelenchick, Eichoff, & Moreno, 2012).

Not surprisingly, among the different social media platforms, Facebook has been the most often studied. A few scales have been developed to specifically measure

Facebook usage, such as Facebook Intensity Scale (Ellison, et al., 2007) and Social Media Use Integration Scale (SMUIS) (Jenkins-Guarnieri, 2013). Rosen and colleagues (2013) are among the few pioneers to assess the use of a more comprehensive array of technology, including smartphones. The Media and Technology Usage and Attitudes Scale (MTUAS) was an extensive effort which resulted in the development of a 60-item comprehensive measurement tool, with 11 subscales measuring technology usage and 4 subscales assessing attitudes towards technology. The MTUAS focused on a wide range of technologies covering both traditional technologies such as TV and newer ones such as smartphones. Nine of the MTUAS items covered the assessment of social media use in general. The authors measured Facebook but pointed out that the term “social media” may be substituted for Facebook in the question stem. The MTUAS is among the most comprehensive instruments providing specific reliabilities and evidence of validities (Rosen, et al., 2013). The Pew Research Center is among the few that specifically examined the use (frequency) and user demographic profiles by major social media platforms including Facebook, Twitter, and LinkedIn (Duggan, et al., 2014), although the specific activities people engaged in regarding social media were not assessed in detail.

Assessing How Individuals Use Social Media and Engagement Levels

Despite increasing efforts to measure social media use, few have examined which activities or the level of engagement among individuals interacting with social media as potential behavioral outcomes that may be measured for research. For example, how do our students in higher education engage in the various social media platforms and what activities do they do as they use social media to interact with others? What are the best ways to engage and communicate information to our students via social media to improve teaching and learning?

Giving the constant changes taking place across many social media platforms, there is an urgent need to develop sensitive, reliable, and valid measurement tools to examine how people engage in the social media world as well as identify the characteristics of social media users for improved teaching and learning. The purposes of the current study are to build on the efforts of both the Pew research via examining utilization patterns by major social media platforms (Duggan, et al., 2015) and assessing specific engagement behavioral activities (Rosen, et al., 2013) to further capture the rich social media utilization patterns and activities. Specifically, the current study aims to establish and pilot test a suite of composite social media use indexes to better describe how people use social media as well as to quantify

engagement levels. These measurement tools and indexes aim to provide summative scores for parsimony and easier comparison purposes that can be used for audience analysis and program evaluation and establish individual engagement activity profiles that can be examined further for developing targeted and effective strategies to engage with an audience.

METHODS

Sample

An online survey about social media utilization was administered to a convenience sample of individuals aged 18+ years in higher education settings. The study examined four major social media platforms: Facebook, LinkedIn, Twitter, and YouTube. Online survey announcements were emailed to a convenient sample of higher education faculty advisors, staff, and representatives for forwarding to student listservs or groups to which they had access. The survey took about 10-15 minutes to complete. Human subject approval was obtained at the researcher's institution. A total of 372 participants completed the survey in 2015.

Measures

A total of six social media indexes were developed and pilot tested in the current study. These measurement items were developed via a review of existing literature studies and multiple-consultation meetings with media communication experts. A small sample of social media users was also asked to review measurement tools and provide feedback. Suggestions were then incorporated in the revisions before the online survey was administered.

Items on the four major social media platforms, Facebook, Twitter, YouTube, and LinkedIn, were included. Three SM indexes were created to measure how actively someone uses social media (SMactive, SMfreq, and SMyr), and one index was used to measure the likelihood of social media adoption (SMadopt) among less active users (i.e. use social media less than once a month). Each index was calculated via a composite summative score of the four key SM platforms. Two indexes were used to measure SM engagement levels (SMengage-basic & SMengage-pro), which included 9 basic and 4 advanced social media behavioral activities respectively. Measurements of each index were described below. Descriptions and statistics of these scales and items were detailed in Tables 1, 2A, and 2B.

SMactive index. Participants were asked whether they have an account with any of the following four social media sites (Facebook, LinkedIn, Twitter, or YouTube). The scores of these four yes-no items were then added up to create the SMactive index, with the possible index range of 0 to 4.

SMfreq index. Participants were asked how often they use the four different social media sites. Response options comprised never, rare, monthly, a few times per month, weekly, a few times per week, or daily. The scores of these four items were then added up to create the SMfreq index, with a possible range of 4 to 28.

SMyr index. Participants were asked how long they have been using the four different social media sites. Response options were never, less than 6 months, 6 month to 1 year, 1-2 years, 2-3 years, and more than 3 years. The scores of these four items were then added up to create the SMyr index, with a possible range of 4 to 24.

SMadopt index. Participants were asked if they currently DO NOT actively use social media (e.g. at least once a month) and how likely they are to start (or become more active) within the next 2 years. Response options were not likely, 50/50 chance, very likely, and already active users. The scores of these four items were then added up to create the SMadopt index, with possible range of 4 to 16.

SMengage-basic index. Frequencies of common social media engagement activities were asked, with 6-point Likert scale response options ranged from never, rare, to very often. These common (basic) engagement activities measured include the following: read other's posts or tweets or updates, post own messages or tweets or updates, "like" others' posts or links, "follow" or "friend" others, comment on others' posts or tweets or links, respond to own posts or tweets or links, share others' posts or links, share others' photos or (video) links, and share own photos or videos/links (see Table 2A). Six of the SMengage-basic items were adapted from the Media and Technology Usage and Attitudes Scale (Rosen, et al., 2013), with three additional items developed based on expert consultation and pilot participant feedback. The scores of these nine items were then added up to create the SMengage-basic index, with a possible range of 9 to 54.

SMengage-pro index. Participants were asked whether they had ever engaged in any of the following activities, including created or hosted an event using SM tools, created a SM page or group, created a YouTube channel, or wrote a tweet using a hash tag (#) (see Table 2B). The scores of these four yes-no items were then added up to create the SMengage-pro index, with a possible range of 0 to 4.

Analyses

Descriptive statistics were used to describe the demographics and various social media indexes and engagement activities. Cronbach alpha was used to assess the internal consistencies of the 6 social media indexes. In addition, correlation analyses were conducted for each of the SM index with participants' "views towards social media," an item adapted from PEW's Internet study, to provide evidence of the criterion validity of the scales (Choi & Reed, 2011). The three groups of "views towards social media" were "social media is an important part of life that you wouldn't want to live without," "social media is enjoyable but not very important," or "social media is something that you could easily do without." To further establish discriminant validity of the SMengage-basic and SMengage-pro scales, those who scored in the top 1/3 (early adopters) were compared with those who scored in the bottom 1/3 (late adopters) on the various SM indexes. Finally, to establish the social media utilization pattern profiles, T-tests and ANOVA were used to compare the various social media indexes by different demographic variables (age, gender, marital status, and education levels).

RESULTS

Demographics & Social Media Indexes

A total of 372 adults participated. About 60% were females, 71% had college education, 58% were never been married, and the mean age was 28.5 years. Over 95% used the Internet every day, over 43% spent 3-5 hours online, and 21.8% spent 6+ hours online daily.

The means of the SMactive level were 2.31 (SD=1.02; range 1-4), 15.03 (SD=5.08; range 4-28) for the SMfreq index, 14.44 (SD=4.44; range 4-24) for the SMyr index, and 10.41 (SD=3.195; range 1-4) for the SMadopt index (Table 1). The study data showed that the social media utilization patterns (whether participants had an active social media account) varied drastically by different platforms. Facebook was still by far the most popular platform used by almost all study participants (93%), followed by YouTube (61%). On the other hand, over 60% of the study participants indicated they had "never" used LinkedIn or Twitter. Regarding interaction frequency, over 75% of the participants checked Facebook daily or a few times a week, followed by YouTube (43%), Twitter (20%), and LinkedIn (8%). Facebook also has the largest portion of use for over 2 years (80%), followed by YouTube (70%), and then Twitter and LinkedIn (each had about 17%). Among those less active users (i.e. those who indicated using social media less than once a month), 26% rated themselves very likely to become more active in the next 2 years on YouTube, followed by Facebook (20%), LinkedIn (14%),

and Twitter (5%) (see Table 1).

Table 1 Social media active level (SMactive, SMfreq, SMysrs, and SMadopt) by Major Platforms

Index Name	Index Range Mean (SD)	Item Description (Response options)	Facebook	LinkedIn	Twitter	YouTube
SMActive	1-4 2.31 (1.02)	Do you <u>have an account</u> with any of the following social media sites? (Yes – No)	Yes (%) 92.9%	Yes (%) 37%	Yes (%) 36.8%	Yes (%) 61.0%
SMfreq	4-28 15.03 (5.08)	<u>How often</u> do you use the following social media tools? (Never – Rarely – Monthly – A few times per month – Weekly – A few times per wk – Daily)	Mean (SD) 5.83 (1.96)	Mean (SD) 2.04 (1.71)	Mean (SD) 2.51 (2.30)	Mean (SD) 4.66 (1.97)
SMysrs	4-24 14.44 (4.44)	Approximately <u>how long</u> have you been using these social media tools? (Never – < 6mon. – 6mon. ~ 1 year – 1~2 yrs – 2~3 yrs – 3+ yrs)	Mean (SD) 5.23 (1.41)	Mean (SD) 2.19 (1.76)	Mean (SD) 2.25 (1.78)	Mean (SD) 4.78 (1.76)
SMadopt	4-16 10.41 (3.20)	If you currently DO NOT actively use social media (e.g. at least once a month), how likely are you to start (or become more active) within the next 2 years? (Not Likely – 50/50 Chance – Very Likely – Active User)	Mean (SD) 3.41 (1.06)	Mean (SD) 2.00 (1.71)	Mean (SD) 1.90 (1.17)	Mean (SD) 3.11 (1.17)

Smengage-Basic & Smengage-Pro

The means of SMengage level were 33.3 (SD=11.79; range 9-54) for SMengage-basic, and 1.44 (SD=1.27; range 0-4) for SMengage-pro. Among the 9 basic engagement activities (SMengage-basic), the data showed that participants engaged more in passive or receptive activities such as reading (57.3%) or liking (49.1%) a post, comment, or tweet. Only about a third of the participants indicated that they had “posted own updates” (29.9%) or “commented on others” (29.7%), except that participants indicated a little higher engagement towards “responded to own posts” (37.7%). Although similar percentage of participants “shared own photo/videos” (28.0%), fewer “shared others’ links” (22.9%) or “shared others’ photos/videos” (18.6%) (Table 2A). Among the 4 advanced engagement activities (SMengage-pro), the data

showed that participants most often used social media to “create/host events” (50.1%) or “create a page/group” (46.7%), and fewer “created a YouTube channel” (23.2%) or tended to “write tweets/posts using a hash tag (#)” (24.1%) (Table 2B).

Table 2A SMengage-Basic Scale – Item Descriptions and Statistics

SMengage-Basic (9-items)	Scale Mean (SD): 33.3 (11.79)					Scale Range: 9-54	
How often do you:	Mean (SD)	Never	1. (rare)	2.	3.	4.	5. (very often)
1. Read other’s posts or tweets or updates	4.37 (1.71)	11.7%	6.8%	7.4%	16.8%	21.1%	36.2%
2. Post own messages or tweets or updates	3.59 (1.63)	15.7%	12.3%	14.8%	27.4%	14.5%	15.4%
3. “Like” other’s posts or links	4.16 (1.61)	10.0%	8.6%	11.4%	20.9%	23.7%	25.4%
4. “Follow” or “Friend” someone	3.65 (1.52)	11.2%	13.2%	18.3%	27.5%	16.3%	13.5%
5. Comment on other’s posts or tweets or links	3.65 (1.53)	12.9%	10.0%	19.1%	28.3%	16.6%	13.1%
6. Respond to your own posts or tweets or links	3.83 (1.61)	13.1%	10.0%	12.9%	26.3%	20.6%	17.1%
7. Share other’s posts or links	3.34 (1.49)	14.6%	15.7%	22.9%	24.0%	14.0%	8.9%
8. Share other’s photos or (video) links	3.20 (1.45)	15.1%	18.6%	22.9%	24.9%	11.4%	7.1%
9. Share own photos or videos / links	3.53 (1.56)	14.7%	11.5%	20.5%	25.4%	15.3%	12.7%

Table 2B SMengage-Pro Scale – Item Descriptions and Statistics

SMengage-Pro (4-items)	Scale Mean (SD): 1.44 (1.27)	Range (0-4)
Have you ever: (Y/N)	Yes (%)	
1. Created or hosted an event using social media tool	50.1%	
2. Created a social media page or group	46.7%	
3. Created a YouTube channel	23.2%	
4. Written a Tweet using a hashtag (#)	24.1%	

Reliabilities & Validities

All the six indexes (SMactive, SMfreq, SMyr, SM adopt, SMengage-basic, and SMengage-pro) showed strong, consistent, and significant correlations among each other, with correlation coefficients ranged .383 ~ .742 (all $p < .001$). The internal

consistencies of the six indexes using Cronbach alpha also showed satisfactory reliabilities ($\text{Alpha}=.877$; CITC ranged $.490\sim.804$). In addition, all of the six social media indexes also showed positive and clear linear correlations with participants' view towards social media, demonstrating clear and strong (criterion) validity (all $p<.001$) (Figure 1A & 1B). The results demonstrated that those who scored higher on various indexes were more likely to view SM as an important part of life that they wouldn't want to do without (all $p<.001$). Finally, to examine discriminant validity of the SMengage-basic and SMengage-pro scales, those who scored among the top 1/3 of the scales (early adopters) were compared with those who scored among the bottom 1/3 (late adopters) on the three SMactive, SMfreq, and SMyr indexes and online duration. The data showed that early adopters and late adopters scored significantly different on these variables, demonstrating strong scale discriminant validity evidence (Table 3).

Figure 1A & 1B Criteria validity – Social Media Indexes and Participants' View towards Social Media

Table 3 Discriminant Validity – Social Media Indexes and Online Duration between Early Versus Late Social Media Adopters.

	<u>SMengage-basic</u>			<u>SMengage-pro</u>		
	Bottom 1/3 (n=116)	Top 1/3 (n=127)	p-value	Bottom 1/3 (n=109)	Top 1/3 (n=164)	p-value
Online duration	1.72 (.723)	2.09 (.684)	<.001**	1.68 (.735)	2.00 (.718)	<.001**
<u>SMactive</u>	1.83 (.857)	2.69 (.980)	<.001**	1.83 (.951)	2.65 (.963)	<.001**
<u>SMfreq</u>	11.23 (4.540)	17.84 (4.207)	<.001**	12.50 (4.814)	16.92 (4.688)	<.001**
<u>SMyr</u>	12.13 (4.684)	16.18 (3.907)	<.001**	12.47 (4.287)	16.05 (4.165)	<.001**

Note: Bottom 1/3 of the scale – late adopters; Top 1/3 of the scale – early adopters.

Sm Indexes by Demographics

Data also showed those who had never been married were more likely to use the various SM platform more often (SMfreq 15.88 vs. 13.91; $p < .001$), adopt new SM tools (SMadopt 10.80 vs. 9.98; $p = .019$), engage deeper (SMengage 34.95 vs. 31.31; $p = .005$) or be more advanced SM users (SMengage-pro 1.65 vs. 1.19; $p = .001$). Those with higher education levels were also more likely to engage deeper (SMengage: graduate >

college > high school levels 12.24 vs. 11.58 vs. 10.83; $p=.024$), yet those with high school education or less were more likely to be advanced SM users compared to those with college and graduate education (SMengage-pro: HS > college/graduate 1.35 vs. 1.23 / 1.24; $p=.003$). Youngers were more likely to adopt or engage deeper with social media as well. There were, however, no differences by gender on the various SM active or engagement levels. More active and engaged users preferred more frequent contacts from SM communication as well.

DISCUSSION

This study provides a validated measurement tool to better describe how people have used SM as well as quantifying SM active and engagement levels. Data from the current research provided data-driven evidence on both the internal consistencies (reliabilities) of the measures as well as criterion and discriminant validities. Overall, these composite indexes developed from the current study showed strong internal consistencies of the various indexes on measuring the various dimensions of social media use activities with strong Cronbach alpha and index correlations. The measurement tool developed was supported by the existing literature and expert panel review with established face and content validities. In addition, the study further established concurrent and predictive validities using PEW's measure as a proxy external criteria. The current data regarding these composite indexes revealed strong and clear linear relationships with "views towards social media in life" (all $p<.001$), the PEW proxy criterion indicator used in the current study. The current results also showed that SMengage scales were sensitive to discriminate early versus late social media adopters, demonstrating discriminant validity.

The current data showed that study participants were overall somewhat active on various social media platforms. Facebook was the most popular and had the longest user history among all social media platforms, which was consistent with the existing research (Duggan, et al., 2014; Stelzner, 2015). YouTube was the second most used social media platform, with the highest portion of less active participants indicating very likely to adopt or engage more in the next 2 years (26%). This finding supports the emerging trend and promising strategy of using video to communicate important messages.

The current data also showed that participants were overall somewhat engaged in basic or low level of engagement activities such as reading, liking, following, or sharing. A previous study examining specific social media use among college students also found their study participants to be more likely to be information receivers rather than

information creators (Xu & Mocarski, 2014). The current study also shows relatively low levels of more advanced social media behaviors, such as hosting events and creating social media pages or channels. This is among the first studies to examine the different levels of engagement and specific social media activity participants. Despite the significant amount of time spent on social media, the current data showed somewhat surprising findings that these young and highly educated participants were in fact mostly engaged in “receptive” activities with low engagement levels. The current data suggest that social media communication and interaction strategies should consider both the type of activities and level of engagement the currently targeted audiences most often engage in to successfully reach and measure changes.

The extant findings are consistent with the current study, showing that those with higher education levels are more likely to use social media (Perrin, 2015). Current new and validated measurement tools are further able to provide additional insights examining the breakdown between those basic and advanced social media users according to their education levels. The current data shows that, while college graduates have deeper engagement with social media, those with high school education are more advanced in their use of social media. Although the current study sample was adults working in higher education, it should be noted that not all adults in higher education have or completed a college education. Thus, those with a high school education were likely to be undergraduate students as opposed to graduate students. Further studies are recommended to continue to examine factors influencing different social media engagement activities in order to identify tailored communication strategies for improved teaching and learning in higher education.

Regarding social media indexes by demographic groups, the current data show consistent findings in the existing literature that younger adults are more likely to be early adopters of social media or emerging technologies (Stelzner, 2015; Duggan, et al., 2014). In addition, singles (i.e. those who have never been married) had higher activity and engagement levels. Existing studies also find that single/unmarried individuals are significantly more active in Internet searching, media sharing, or Facebook activities (Rosen, et al., 2013). Such frequent use and deeper engagement in social media among singles or those who have never been married could result from the desire to increase social capital (Uluslu, 2010). The current data find no differences according to gender on the various SM activity or engagement levels. This finding is consistent with Pew’s long history of social media study, which also indicates that women and men use social media networking sites at similar rates (Perrin, 2015).

This study examined a convenience sample of young adults working in higher

education settings; thus, generalizing the results for other groups should warrant caution. Young and higher-educated individuals are normally more likely to be early adopters of social media and thus are more likely to provide potential differential levels of social media use on various platforms for measurement validation purposes. Due to the rapidly changing field of social media, the current study did not include all emerging social media platforms. Future studies should also consider adding social media mobile apps to research measurement tool development.

The outcome of this study provides insights into the use of social media for teaching and learning in higher education settings. The ability to succinctly identify and describe the type of activity participants engage in as well as to quantify the degree of engagement levels on social media can play a significant role in helping educators in planning realistic social media communication for enhanced teaching and learning. Future studies should also consider adding educational outcomes to assess the relationship between social media behavioral activity engagement and learning outcomes.

CONCLUSION

Current research provides new research tools to measure how active people are by the various social media platforms (SMactive, SMfreq, SMyr, and SMadopt). All the current social media indexes showed strong correlations among the indexes as well as on the item, “views towards social media in life,” adapted from the Pew Research Center (Duggan, et al., 2014). The current study assessed not only duration and frequency, but also how actively individuals have used social media as well as the engagement levels of social media use. Specifically, the current study provides innovative index scales to examine the social media engagement level and the specific behavioral social media activities in which one engages. The study instrument measures different types of social media activities by different platforms to provide better understanding of utilization and engagement patterns for tailored social media communication planning and thus benefit teaching and learning purposes.

In summary, this study provides a reliable and validated measurement tool to better describe how people have used SM and quantify social media activity and engagement levels. The ability to succinctly identify and describe the type of activity participants engage in as well as to quantify the degree of engagement levels is critical for educators as they plan for tailored social media communication in enhanced teaching and learning.

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