Measuring Student Attitudes Toward Learning with Social Media: Validation of the Social Media Learning Scale

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Abstract

Data gathered online from 147 adult social media users were used to validate the eight-item, Likert-type, Social Media Learning (SML) scale. Instrument validation procedures included analysis for internal consistency reliability, principal components exploratory factor analysis, and multidimensional scaling. Cronbach’s Alpha for all 8 items of the SML scale was found to be “respectable” (Alpha = 0.78) according to reliability guidelines by DeVellis (1991). Exploratory factor analysis indicated two factors existed among the eight items: Interactive Learning (Alpha=0.65) and Learning Communications (Alpha=0.73). This research indicated that the Social Media Learning scale is worthy of further use in the measurement of student preferences in social media, such as Twitter, Facebook, Google+, and other similar tools in course communications. Accurate measurement of concepts such as these could support new models for interactive teaching and learning within the Web 2.0 communications environment of the 21st century.

Key words: social media learning, technology attitudes

Introduction

The Social Media Learning (SML) scale was developed from a larger student survey used to measure student perceptions of Twitter for course interaction as well as reflections in undergraduate courses in global policy and digital textuality at a Texas university. The student survey was analyzed and refined by college faculty and learning technologies graduate students. One section of the survey, initially referred to as the Twitter scale, was found to be of great interest to students and faculty alike due to the rising role of social media for communications in academia together with interesting psychometric scale properties identified: the Twitter scale came to be called the Social Media Learning (SML) scale. The refinement process revealed that two subscales: SM Learning Communications (Alpha = .73) and Interactive Learning (Alpha = .65) having respectable and minimally acceptable reliability, respectively (DeVellis, 1991). Cronbach’s Alpha for all 8 items of the SML scale is respectable (Alpha = .78), according to internal consistency reliability guidelines provided by DeVellis (1991).

The courses where Twitter had been implemented as a mandatory communication tool were both designed to combine and extend classroom discourse and to provide students with additional materials, spontaneous updates, and opportunities for interaction via social media. The course instructors and the instructional designer were seeking avenues by which students could construct their own knowledge and engage in discourse to make greater sense of the course materials, expanding learning via blogs and tweets to support expressions of concepts that would highlight central points interactively. The intent was to support student interaction with content and increase knowledge construction. Students were provided with prompts to invite discourse for development and display of concepts as well as to critique course components. The guided instruction by the instructors as well as the collaborative interaction between the students via social media in these university courses in many cases contributed to engaging discourse. Twitter messages are short, 140 characters or less. This provides learners with both a challenge and promotes students sharing very succinct messages. Technology discourse is becoming commonplace
in 21st century educational environments. It is an important component of distributed learning and teaching because it allows for a more active mode of communication.

**Review of Literature**

**Social Media in Education**

Educators and institutional administrators are increasingly promoting and trying out social media tools in attempts to open up communication channels, to tie students closer to their institution (Heiberger & Harper, 2008) and to engage students more in their classes (Junco, Heiberger, & Loken, 2010; Junco, 2012a). Such tools include, for instance, the popular among students ‘Facebook’ application and the microblogging tool ‘Twitter.’ Reasons often given for using such tools in an educational setting include the need to meet students where they already are (Bodle, 2011), especially in the online spaces they inhabit (Heiberger & Harper, 2008). Research-based evidence from the usefulness of social media implementations for learning purposes, however, remains limited (Hew, 2011; Junco, et al., 2010). There is larger body of evidence to indicate that excessive, non-instructional social media use cannot be grouped with educationally beneficial activities.

The Higher Education Research Institute (HERI, 2007) reported from a large scale study that extensive socializing online (more than six hours) negatively impacted students study time and study habits. Later quantitative studies have confirmed this. Junco’s (2012a) study that explained the negative relationship between student engagement and Facebook use, as well as Junco’s (2012b) and Kirschnher and Karpinski’s (2010) studies that showed how time spent on Facebook was negatively associated with overall GPA – all indicate that too much social media socializing may have an impact on study-time and thereby on learning. Smith showed in a 2011 study how Americans in general use social media and several studies have further suggested how educators can use social media in the educational landscape for community-building, social learning, and borderless collaboration (Hsu & Ching, 2011; Dunlap & Lowenthal, 2009; Cochrane, 2010). Recommendations include uses that promote being together and closeness; that is, a social presence. In an experimental mixed-methods study in a fully online course, however, Wakefield, Warren, and Alsobrook (2011) noted that students had diverse perceptions of whether or not the implementation of Twitter as a mandatory communication tool contributed to a sense of social learning community.

As noted above, the majority of research conducted so far relating to use of social media within education has been focused on engagement or social presence. Examples include Walter & Barazova’s (2008) study on how social media allows for propinquity within groups and addresses the perceived impact on social presence. Researchers have also looked at number of tweets and their communicative purposes (Boyd, Golder, & Lotan, 2010; Honeycutt, & Herring, 2009) and instances of job postings over LinkedIn, a social network for professionals analyzing qualifications needed as specified by employers (Wakefield, Warren, & Mills, 2012).

Other than the social presence and social community studies, experimental studies using social media in the classroom are few. Examples include Borau, Ullrich, Feng, and Shen’s (2009) study where the researchers used Twitter successfully for language learning. Further, the ICMPA (2010) and Flippin-Wynn & Tindall (2011) studies looked at how social media (or the absence thereof) now strongly impacts students’ lives.

What is missing in the educational environment are new reliable instruments to gauge this new type of learning – student learning with social media – particularly in the classroom setting. Recognition of ways in which information, communication, technology, and learning (ICTL) are changing nearly all facets of our lives (Christensen & Knezek, 2008), as well as new standards for technology literacy and technology integration, have created a need for a broader examination of the role that 21st century technology can play in teaching and learning (Mayes, Mills, Christensen, & Knezek, 2012). Interest in student social learning includes examination of social media learning and student career choices in seeking to understand STEM career dispositions as related to how students prefer to use technology (Knezek, Mills, Wakefield, & Hopper, 2012). In the current research study we validated a prototype instrument, the Social Media Learning (SML) scale, which measures preference for learning with social media.

Few quantitative research papers were found reporting on the use of scales measuring other than what people are doing while using social media. However, the scale items in Junco’s (2012a) study on the relationship between Facebook use and its impact on student engagement and Junco, Elavsky, & Heiberger’s (2012) mixed-methods study on Twitter and student engagement both build on The National Survey of Student Engagement (NSSE) instrument (NSSE), a validated instrument with acceptable psychometric properties assessing student engagement in good educational practices and gains from the college experience (Kuh, 2001). Another such study is Dholakia, Bagozzi, and Paeoro’s (2004) research on virtual community participation, which builds on items from Flanagan and Metzger (2001). Several studies where found where unvalidated instruments had been used, i.e. new
Instruments (Hughes, Rowe, Batey, & Lee, 2012; Joinson, 2008; Mazman & Usłuel, 2010). Another such study is Wakefield, et al.’s (2011) study on students’ use of Twitter targeting student comfort, perceived community, social presence, and interactive learning in a course on Global Policy issues. The SML instrument evolved from this Global Policies Twitter instrument and was further developed in another university course. Subsequently the SML survey instrument was analyzed and further developed by Alsobrook, Wakefield, and Knezek in 2011 into the Social Media learning (SML) scale.

Instrument Development

Instrumentation indicates rigor (Straub, 1989), and therefore we want to ensure the instrument we are using in our current research has undergone examination for validation. The Social Media Learning scale was developed to help understand students’ reactions to social media applications such as Twitter, Facebook, Google+, and similar, in support of undergraduate university curriculum. Instrument development included analysis for internal consistency reliability, principal components exploratory factor analysis, and multidimensional scaling. A review of the literature revealed a need for validated instruments to measure students’ preferences for social media discourse interactions centered around university coursework. Items for SML Version 1.0, an 8-item Likert-type instrument, are displayed in Table 1. Responses are rated on a 5 point scale with response choices from 1= strongly disagree to 5 = strongly agree.

Table 1. The Social Media Learning Scale.

<table>
<thead>
<tr>
<th>Social Media Learning When using social media…</th>
<th>SD</th>
<th>D</th>
<th>U</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel a sense of community</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. learning becomes interactive</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. posting questions to my peers helps me understand my readings better</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I am able to get faster feedback from my peers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I am able to get faster feedback from my instructor</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I am able to communicate effectively</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I am able to connect with peers more easily than face-to-face</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I increase my participation in classes when I am allowed to contribute through social media</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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Data Collection

Survey subjects were volunteer adult social media users who responded to email and facebook invitations to participate in a study of learning preference. One hundred forty-seven (147) respondents completed an online Learning Preference battery that included the SML scale during the spring of semester of 2012. The study participants were 76% women (n=112) and 24% men (n=35) spanning 18 to 69 years of age.
Instrument Refinement

Scale Construct Reliability and Validity

Internal consistency reliability analysis was used to assess the reliability of the SML scale. As shown in Table 1, Cronbach’s Alpha for all 8 items of the SML scale is considered “respectable”, (alpha = .78) according to reliability guidelines by DeVellis (1991). Exploratory factor analysis, principal components analysis (PCA) with varimax rotation, was conducted in order to identify scales/factors that are orthogonally aligned (Mertler & Vannatta, 2005).

Analysis of the exploratory factor analysis Scree plot (see Figure 1) indicated one or possibly two factors should be retained, based on the Scree plot of factors with eigenvalues greater than one and, according to Stevens’ (1996) suggestion that constructs in the sharp decent of the graph, before the first point of leveling, should be retained. The two-factor solution was retained. A scale constructed from Items 1, 2, 7 and 8 resulted in Alpha=0.66, and items 3, 4, 5 and 6 produced Alpha=0.68. These Alpha’s were considered only minimally acceptable according to guidelines by DeVellis (1991) and would have resulted in two substandard scales. Further refinements are presented in the following sections.

Multidimensional Scaling

Multidimensional scaling was conducted to further examine the underlying factors for the SML scale. The ALSCAL Euclidian distance model with maximum of two dimensions was generated to examine distances and proximities for items in relation to one another. As shown in Figure 2, the two main output groupings visible in the Euclidean distance model are separated by the vertical axis, revealing one respectable subscale (items 4, 5, 6, 3, 1) and one minimally acceptable subscale (items 8, 2). The first cluster/subscale has its strongest factor loading on item 4, I am able to get faster feedback from my peers, and was named SM Learning Communications. The second subscale with strongest loading on item 8, I increase my participation in classes when I am allowed to contribute through social media, was named Interactive Learning. Upon review of the scale items, the research team agreed that these factors / subscales have reasonable content validity with respect to the desired research domain, and therefore this two factor solution was accepted. Factor analysis and multidimensional scaling confirmed a two construct solution which was verified by the research team to also possess face (content) validity. Items comprising each of the Social Media Learning subscales are listed in Table 2.
Table 2. Social Media Learning Items

Social Learning Communications

When using social media...

4. I am able to get faster feedback from my peers.
5. I am able to get faster feedback from my instructor.
6. I am able to communicate effectively.
3. Posting questions to my peers helps me understand my readings better.
1. I feel a sense of community.

Interactive Learning

When using social media...

8. I increase my participation in classes when I am allowed to contribute through social media.
2. Learning becomes interactive.

Figure 2. Euclidean distance model. Multidimensional scaling plot of SML items.

Criterion-Related Validity

Criterion related validity was examined for the scales of SML by correlation analysis with the Integrated Communications Technology Learning (ICTL) scale, a 15-item, Likert-type survey instrument developed by Mills and Knezek (2012) for research on learning preferences in higher education. ICTL assesses student preference for learning with integrated communications technology options of the Web 2.0 world of the 21st century, specifically for information seeking, and information sharing, as shown in Figure 5. Mills, Knezek and Khaddage (2012) found the internal consistency reliability for the Information Seeking (Alpha = .71) and Information Sharing (Alpha = .83) to be respectable and very good (DeVellis, 1991) among n=62 undergraduate and graduate university students in a 2011 study among higher education learners (Mills, Knezek & Khaddage, 2012). The items comprising each scale are listed in Table 3.
Table 3. ICTL Scales

**Information Seeking**

1. I learn more when I regulate my own learning experience and seek information on things that I want to learn about.
2. I use Internet technology to explore topics of interest.
7. I like to take classes from good professors.
10. Internet technology helps me be successful in my college classes.
4. I like to enroll in classes to continue my education.
8. I use Internet communications technology tools when I want to learn about something new.
14. I use Internet communications technology to keep current on topics related to my field of expertise.

**Information Sharing**

3. I like to share interests and reflections online.
5. I use Internet communications and other technology tools for self-expression.
6. I learn many things by interacting with other Internet users.
11. More classroom learning should include interactive communication technology experiences.
1. I would like to be a participating member of an online community.
15. I post information that might be of interest to other people.
9. I learn best in a traditional classroom setting. (R)
12. The things I need to know are taught by instructors in the classroom.

**Criterion-Related Validity**

Bivariate correlation was examined for Social Media Learning and Integrated Communications Technology Learning scales to determine if SML scales would align as an indication of criterion related validity. Significant (p < .05) correlations were identified between SML scales (SM Learning Communications, Interactive Learning) and ICTL scales (Information Seeking and Information Sharing). The specific correlations were:
1) SM Learning Communications and ICTL Information Sharing r = 0.55 (p < .0005),
2) SM Learning Communications and ICTL Information Seeking r = 0.33 (p < .0005),
3) Interactive Learning and ICTL Information Sharing r = 0.40 (p = .009), and
4) Interactive Learning and ICTL Information Seeking r = 0.21 (p < .0005).

Correlations (p < .01) were also identified between the Social Media Learning (SML) scales and other factors measured for n=147 participants in the study: a) SML total scale score and participant gender r = 0.22 (p = .007), b) SM Learning Communications and participant age and r = -0.35 (p < .0005), c) SM Learning Communications and home internet usage hours r = 0.32 (p < .0005).

To summarize, participant age is negatively correlated with total preference for SML. Gender is positively correlated with SML, meaning females prefer social mediated learning more than males. Mean scores for SML total scale score for men (3.11) differed from women (3.42), with moderate Cohen’s D effect size of 0.52. SML scales for Learning Communications and Interactive learning are both more strongly correlated with a preference for sharing information than for seeking information, based on ICTL scales.

**Discussion**

Aittola (1999) pointed out that the role of formal education as the disseminator of significant learning experiences has diminished. ICT tools such as those designed for social media support a variety of distributed learning, sharing, and knowledge construction activity options (Knezek, Lai, Khaddage & Baker, 2011) thereby creating new avenues for formal and informal learning interaction. Learner preference for social media communications within an educational context can be measured by validated instruments such as the Social Media Learning scale. With appropriate instructional design educators and technology developers can be assisted in meeting the challenges identified by Naismith, Lonsdale, Vavoula, and Sharples (2004), mainly that of finding ways to ensure that new learning methods are effective – highly situated, personal, and collaborative for the long term,
and accepted by students. An understanding of student preferences is key to identifying students’ level of acceptance, opinions and expectations regarding the integration of new technologies into teaching and learning. The development of such an understanding is what Andrews and Tynan (2012) have referred to as “investigating the human voice” (p. 565) in order to better meet the needs of today’s learner.

Summary and Conclusions

This research validated (showed the appropriateness of) the Social Media Learning scale for measurement of student preferences for use of social media, such as Twitter, Facebook, Google+, and other similar tools, in course communications. Valid instruments such as the SML scale can contribute new knowledge to the emerging models being developing within instructional design to include use of social media. The implication is that SML scales for measurement of student preference toward SM Learning Communications and Interactive Learning are important points of consideration for designing instruction that will promote student engagement and collaborative learning by encouraging educational discourse. The Social Media Learning scale was found to have construct and content validity, aligning with the ICTL survey, as anticipated. For example, students who spend more time on the Internet at home have higher regard for social media learning. Further research is needed to determine if SML Version 1.0 and its anticipated expanded version will be useful in addressing additional research questions on students’ attitudes towards social media course interaction and educational communication, ICT integration, and instructional course design. Accurate measurement of concepts such as these could support new models for interactive teaching and learning within the Web 2.0 communications environment of the 21st century.

References


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