

## Exploring the Relationship Between Student-Instructor Interaction on Twitter and Student Perceptions of Teacher Behaviors

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With much attention being placed on the use of Twitter and other social media in the classroom, educators are grappling with the question, "Is Twitter a valid tool to increase classroom effectiveness?" Yet, many responses to this question come from anecdotal and case-study-based information. The present study offers a preliminary quantitative analysis of Twitter in the classroom. A survey-based experiment ( $n = 144$ ) was conducted to measure student perceptions of teacher credibility, immediacy, and content relevance alongside instructor Twitter-use. Results indicate significant, positive correlations between student Twitter-use and positive perceptions of teacher behaviors. These results indicate that Twitter may serve as a valuable tool to supplement more traditional forms of course instruction.

Social media is dramatically impacting communication patterns across contexts, leading teachers at all levels to quickly consider the integration of social media into classroom settings (see Mazur, Murphy, & Simonds 2007, 2009). Yet, some educators may be hesitant to embrace the role of digital technologies in the classroom (Okojie & Olinzack, 2006). This study seeks to examine the potential relationship between teachers' supplemental use of digital media tools in the classroom, specifically Twitter, and student perceptions of instructor credibility, immediacy and content relevance.

### Twitter in the Classroom

Social media can be defined as a group of Internet-based tools that allow users to create and exchange content online (Kaplan & Haenlein, 2010). Twitter is a social media tool which showcases a constant stream of small bits of information (140-character maximum) to subscribers based upon search criteria that the end-user enters or accounts that the end-user follows. Early adopters of Twitter for classroom use have documented surprising results including increased class participation, decreased student shyness, increased writing skills, enhanced discussions, and increased engagement (Ferrenstein, 2010b; Harris, 2010; "Twittering the Student Experience," 2009). In addition, using class-based hashtags to reference course content, students can post questions and insights before, during and after lectures (Ferrenstein, 2010a). A hashtag uses the "#" symbol to signify a keyword in the body of the tweet. If an author wrote "#education" in a tweet, the hashtag would be linked to a Twitter search for any recent uses of the term "#education" in any tweet by any user. This linking device has been connected to student participation in coursework via Twitter (Ferrenstein, 2010a).

The Pew International and American Life Project demonstrated that 59% of students aged 12-17 shared

artistic content online through video, web pages, or blogs; 55% have created social networking pages; and 47% have posted images on content sharing sites (Lenhart, Macgill, & Smith, 2007). These findings suggest that many students are coming into universities with knowledge and experience in social media use.

Dunlap and Lowenthal (2009) describes Twitter as a way to enhance social presence in an online course and suggests some basic best practices for using technology in the classroom: make it relevant, define clear expectations, model effective Twitter use, build Twitter into assessment, and remain active in the Twitter community. Ferriter (2009) encourages teachers to join the digital age and begin to experiment with any new tool that is available to students. He challenges educators to become involved and direct discourse in digital media by creating learning opportunities and thoughtful conversation. In addition, Ferriter (2009) discusses the importance of technology in the classroom by noting that students are able to harness technology to make connections all across the world.

Mazur et al. (2007, 2009) investigated Facebook and demonstrated its possible relationship to instructional practice. Yet, many conversations about Twitter and its usefulness in the classroom reference anecdotal information or case-study-based research. This study seeks to expand upon this work by engaging in a preliminary quantitative analysis of the relationship between Twitter use as a supplemental instructional tool and established measures of instructional effectiveness.

### Student Perceptions of Teacher Credibility and Behavior

The communicative interactions between students and teachers have been codified based upon student perceptions of teacher credibility and behaviors (Glascock & Ruggiero, 2006) and founded in the Rhetorical/Relational Goal Setting Theory, which

“focuses on the rhetorical and relational goals that teachers and students have and how these goals guide the instructional communication that is transacted in the classroom” (Mottet, Frymier, & Beebe, 2006, p. 260). The theory is founded in the notion that communicative behaviors of teachers influence and are influenced by the communicative behaviors of students (e.g., communication-as-transaction, Beebe, Beebe, & Ivy, 2004). These behaviors interact and mutually impact the teaching and learning outcomes in the classroom.

Within the theory, rhetorical goals refer to goals of teacher influence and/or student achievement (e.g., subject-matter mastery, student academic achievement). Likewise, relational goals refer to interpersonal bonds in the classroom and their maintenance (e.g., friendliness, civility, student enjoyment). Mottet et al. (2006) suggest that while rhetorical and relational goals drive teacher-student interaction, student goals (e.g., class enjoyment) may be different than teacher goals (e.g., student motivation). These goals often overlap: for example, a teacher may attempt to use immediacy to increase student motivation to learn so that class will be more enjoyable (Frymier & Shulman, 1995).

In instructional communication literature, student perceptions of these instructional goals have been directly related to both perceived and actual student learning outcomes (McCroskey, Valencic, & Richmond, 2004; Witt & Wheelless, 2001; Witt, Wheelless, & Allen, 2004). This study investigates student perceptions of teacher behaviors—teacher immediacy, teacher content relevance, and teacher credibility—in relation to the instructor’s use of Twitter as a supplemental tool. Teacher behaviors can have a direct impact on student learning. McCroskey and Teven (1999) found that students who believed their instructor was credible tended to perform better in class (Teven & McCroskey, 1997). Finally, Frymier, and Shulman (1995) supported that content relevance was positively correlated with student motivation.

First, teacher immediacy is the perceived physical or psychological closeness between teacher and student. The construct of immediacy was first defined by Mehrabian (1967) and operationalized by Andersen (1979) during her dissertation research. Andersen’s (1979) teacher immediacy scales have been modified with relative success. Smythe and Hess (2005) developed the Nonverbal Immediacy in College Classroom Instruction (NICCI) scale to measure student perception of teacher immediacy in behaviors specifically tuned to college-level instructors. Positive non-verbal immediacy behaviors include facilitating enjoyment, casual attire, self-disclosure, and deflation of power. Non-verbal immediacy has been shown to be one of the best predictors of student satisfaction, student affective learning, student engagement/participation, and student motivation in the

classroom (Christophel, 1990; Richmond & McCroskey, 1990). Interestingly, the NICCI uses student perceptions of in-class, non-verbal behaviors to predict teacher immediacy.

Second, teacher content relevance has been defined as the ability of the teacher to make the content of the course applicable to student lived experience (Frymier & Shulman, 1995). More specifically, relevance has been defined as “the extent to which making a judgment has significant consequences for the self” (Sanbonmatsu, Shavitt, & Sherman 1991, p. 125). Petty and Cacioppo (1984) proposed that personal relevance determined whether or not information would generate consideration and analysis. Keller (1983) applied personal relevance directly to the classroom by defining it as the student’s perception that course content satisfies personal needs or personal goals, noting that relevance was critical to gaining a student’s attention, increasing their confidence, and creating overall satisfaction with a course (Keller, 1983, 1987). Teachers can often increase student perceptions of content relevance by using real-world examples, experiential learning, and practical illustrations of course content in class. The scale employed by Frymier and Shulman measures student perceptions of the examples used by the instructor in class to make course material more approachable for students.

Third, teacher credibility has been defined as a combination of instructor competence, trustworthiness, and caring toward students (Teven & McCroskey, 1997; McCroskey & Teven, 1999, Finn et al., 2009). McCroskey, Holdridge, and Toomb (1974) established teacher credibility as the ability of the teacher to persuade the students in the course that he/she is a competent teacher. Teacher character refers to student perceptions of a teacher’s trustworthiness; teacher competence refers to student perceptions of a teacher’s subject-matter expertise and ability to relay information to students. Caring refers to student perceptions of the teacher’s demonstrated concern for the welfare of students (McCroskey & Teven, 1999). McCroskey and Teven (1999) employed a scale for assessment of teacher credibility which uses a Likert-type scale to rate instructors on various dialectics of personal characteristics.

Teacher immediacy, content relevance, and credibility have each been interrelated with affective learning and correlated with each other, suggesting that teacher behavior, teacher credibility and student learning are several integral parts of the scholarship and practice of teaching and learning (McCroskey et al., 2004).

Thus, by combining the use of Twitter as a supplemental instructional tool with student perceptions of teacher behaviors, this research study poses the following research questions:

- RQ 1: What is the relationship, if any, between student perceptions of teacher immediacy and frequency of student-instructor interaction on Twitter?
- RQ 2: What is the relationship, if any, between teacher content relevance and frequency of student-instructor interaction on Twitter?
- RQ 3: What is the relationship, if any, between student perceptions of teacher credibility and frequency of student-instructor interaction on Twitter?

### Methods

The 144-student sample included 41 (28.5%) males and 101 (70.1%) females (two did not indicate gender), ranging in age from 18 to 48 ( $M = 19.82$ ,  $SD = 1.219$ ).

Participants included 26 (18.1%) first-year students, 46 (31.9%) sophomores, 32 (22.2%) juniors, 27 (18.8%) seniors, and nine (6.3%) graduate students (four did not indicate their classification), and represented all five colleges at the institution, a comprehensive university in the Southeast region of the United States. Participants included 107 (74%) White students, 21 (15%) African American students, and 12 (8%) students who selected multiple ethnicities or "other." Students were surveyed in 12 separate classrooms and asked to relate their comments to the classroom and instructor for each particular course.

Three instructors were chosen for this study because they used Twitter, but did not require students in their courses to use it. For each instructor, four courses were assessed. Each instructor tweeted multiple times per week (typically several times daily) about professional matters related to his/her field of study and personal anecdotes. Students were not required to read their instructor's tweets. Of the students surveyed 53 (37%) indicated having a Twitter account, 64 (44%) were aware that their instructor in the surveyed class was using Twitter, and 73 (51%) indicated having used Twitter in relation to that specific classroom experience. The disparity in these numbers may indicate that some students read their instructor's public tweets even though the students did not have Twitter accounts themselves.

When invited to complete a survey instrument, participants gave informed consent during regularly-scheduled class meeting times. A survey was administered at the end of the term to assess student experiences in that classroom and to measure teacher behaviors from the student perspective.

The instrument employed 7-point Likert scales and 7-point word comparison scales as well as open-ended questions concerning perceptions of the class, the instructor, and Twitter. Self-reported demographic

information was also collected. The use of appropriate scales was determined by scales previously tested by prior researchers studying each specific research question (McCroskey & Teven, 1999; Smythe & Hess, 2005; Teven & McCroskey, 1997). One of the scales (from Smythe & Hess, 2005) was modified from a 5-point Likert scale to a 7-point Likert scale for greater variability and to maintain a stronger sense of internal consistency of the measures. All three scales generated alpha scores in this study comparable to scores in the articles cited above.

### Teacher Immediacy

Immediacy has been conceptually defined as the perceived intensity and interaction between communicators and their audience (Mehrabian, 1967), in this case between teacher and student. Teacher immediacy was measured using a modified version of the Nonverbal Immediacy in College Classroom Instruction (NICCI) developed by Smythe and Hess (2005) and consisting of eight items. Participants were asked to rate their perceptions of instructor immediacy behaviors using a Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

### Teacher Content Relevance

Content relevance has been conceptually defined in the classroom as the linkage between classroom content and student interests. Teachers who achieve high content relevance are those who create these linkages (Frymier & Shulman, 1995). Teacher content relevance was measured using a modified version of the relevance scale (Frymier & Shulman, 1995) consisting of 12 items. Participants were asked to indicate the frequency with which their teachers performed each behavior using a Likert-type scale from 1 (*never*) to 7 (*very often*).

### Teacher Credibility

Teacher credibility has been conceptually defined in the classroom as joint influence of the competence, trustworthiness, and caring of the instructor toward the students (Teven & McCroskey, 1997). Teacher credibility was measured using the Teacher Credibility Scale developed by McCroskey and Teven (1999) consisting of 18 items. Participants were asked to rate their professor on items relating to the constructs of competence, trustworthiness, and caring using 7-point word comparisons.

### Student-Instructor Interaction on Twitter

Student-instructor interaction on Twitter was defined in this study as the student-reported frequency

of reading instructor tweets and writing tweets. Participants were asked to respond to several items related to the frequency of Twitter use in relation to their instructors. These items used 7-point Likert scales to measure students' perceptions of the instructor's Twitter use, their own Twitter use, and their frequency of reading their instructor's tweets. Students were also asked to respond to two open-ended queries about Twitter.

### Twitter Perceptions

Appropriateness of Twitter as a contact avenue; comfort, ease, and enjoyment of using Twitter; and planned future Twitter use were among the perceptions chosen to illustrate student reactions to Twitter in the classroom. Participants were asked to respond to 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*) on these measures. Participants were also asked to respond to three open-ended queries concerning their thoughts about Twitter and the classroom.

### Results

To answer research questions one, two, and three, researchers tested correlations between the teacher immediacy, teacher content relevance, and teacher credibility scales and measures of Twitter use. As expected, student perceptions of (1) teacher credibility, (2) teacher immediacy, and (3) teacher content relevance were all significantly, positively correlated (see Table 1).

The students' perceptions of Twitter included: (4) the appropriateness of Twitter as a tool for contacting the instructor, (5) level of student-instructor interaction on Twitter, (6) students' planned continued use of Twitter, (7) frequency of instructor tweets, (8) frequency of student Twitter use, and (9) frequency of reading instructor tweets. Table 1 depicts the cumulative correlations among these nine variables.

Student perception of teacher credibility was significantly, positively correlated with student reports of their own frequency of Twitter use. Teacher credibility was not significantly correlated with any other Twitter perception.

Student perception of teacher immediacy was significantly, positively correlated with student perceptions of the appropriateness of Twitter as a classroom communication tool and level of student-instructor Twitter-based interaction. Immediacy was also positively, significantly correlated with the frequency of both instructor Twitter use and student Twitter use.

Student perception of teacher content relevance was significantly, positively correlated with student

perceptions of the appropriateness of Twitter as a classroom communication tool and level of student-instructor Twitter-based interaction. Content relevance was also significantly, positively correlated with the perceived frequency of instructor Twitter use and the frequency with which students read instructor tweets.

Interestingly, students' planned continued use of Twitter was not significantly correlated with any student perceptions of teacher behaviors. Students' qualitative responses are used in the subsequent discussion to address potential inferences related to these correlations.

### Discussion and Implications for Future Research

The relationships suggested by this study offer many avenues for increased discussion and future research on the viability of digital media, and specifically Twitter, as communication avenues in the classroom. The following discussion addresses many of these findings and uses student comments to bolster or clarify some of the relationships suggested by the analysis.

Perceptions of teacher credibility did not demonstrate significant correlations with any Twitter behavior except for frequency of student Twitter use. Thus, students did not perceive greater feelings of character, competence, or caring from instructors using Twitter unless they used Twitter themselves. If students used Twitter frequently, they rated their instructor with higher credibility than students who did not use Twitter. This finding may be related to the students' feelings of shared experience (as suggested in Frymier & Shulman, 1995) or some other issue. Further research could seek to investigate the intricacies of teacher credibility and media technology.

Not surprisingly, Twitter was also significantly correlated to "Perceived frequency of instructor Twitter use" ( $p = .299$ ) at the .05 level. To support this correlation, "Frequency of reading instructor's tweets" was also significantly correlated at the .05 level ( $p = .290$ ). A rather intriguing correlation was discovered in regards to the effects of Twitter on content relevance. Planned continued use of Twitter was not significantly correlated. This statistic is profound because it means that Twitter can impact a student's perception regarding content relevance even if the student chooses not to continue to use the technology. Bill Ferriter (2009) proposes that students lack the ability to create thoughtful discourse despite their technological skills. By using Twitter in the classroom, teachers can create learning opportunities while also increasing a student's ability to engage in thoughtful discourse, and improve their creative and critical writing skills (Harris, 2010). Because content relevance is strongly correlated with Twitter use, it has the power to teach invaluable

Table 1  
*Pearson Correlations Between Perceptions of Classroom Practices and Twitter Use*

Variable	1	2	3	4	5	6	7	8	9
1. Credibility	---	.292**	.464**	.238*	.231	.178	.051	.313*	.154
2. Immediacy		---	.558**	.244*	.292*	.099	.302*	.304*	.231
3. Content Relevance			---	.355**	.395**	.154	.299*	.256	.290*
4. "Twitter is an appropriate way to interact"				---	.813**	.594**	.694**	.416**	.782**
5. "My instructor interacts with me on Twitter"					---	.465**	.725**	.470**	.818**
6. Planned continued Twitter use						---	.132	.466**	.340*
7. Perceived frequency of instructor Twitter use							---	.379**	.781**
8. Frequency of student Twitter use								---	.419**
9. Frequency of reading instructor's tweets									---

Note. \* $p < .05$ . \*\* $p < .01$ .

communication lessons unrelated to Twitter-use once the course is complete.

Perceptions of teacher content relevance were related to the frequency with which students read instructor tweets. This positive, significant relationship might best reveal the quality of the instructors' tweets in this study. One student wrote that her instructor "is insightful and brings focus to contextual areas outside class that relate to our field." Another commented that his instructor's "tweets are relevant to what we do in class." To create linkages, and instill confidence and satisfaction, a student must perceive that the professor is truly engaged in the technology and the course material (Frymier & Shulman, 1995; Keller, 1983, 1987). These positive correlations may lend some credence to Dunlap and Lowenthal's (2009) suggestion to tie participation grades to students' Twitter use for maximum benefit. Further research could deepen the study of content relevance and the ability of Twitter use to focus and clarify classroom conversation.

Both content relevance and teacher immediacy were positively correlated with student perceptions that Twitter is an appropriate way for students and instructors to interact, thus increasing potential learning opportunities outside the classroom. To better understand this finding, the researchers turned to student comments on two open-ended questions: "Do you follow your instructor on Twitter?" and "How would you react if your instructor followed you on Twitter?" The students were often split on this issue. Most students who indicated using Twitter for class purposes wrote about their excitement about

corresponding with the instructor on Twitter. Others demonstrated understanding of Twitter's broadcast power, writing, "If you enter a public sphere like [Twitter] you should be okay with what you say and the consequences." A few students who had not used Twitter for class purposes wrote statements like, "I don't want to talk to my professor after classroom time in an area for my friends."

These comments may indicate that students with greater experience with or understanding about Twitter appreciate the communication transactions that Twitter offers. These comments indicate that future research is warranted about not only teacher content relevance and teacher immediacy, but also student perceptions of personal privacy in online media.

One of the most intriguing findings in this study relates to teacher immediacy. The scale used in this study to assess teacher immediacy, the NICCI, measures student perceptions of teacher non-verbal behaviors in the classroom (e.g., the instructor smiles, gestures, moves around the classroom) as an indicator of perceived closeness between instructor and student (Smythe & Hess, 2005). A significant correlation between instructor Twitter use and immediacy indicates that students perceive that the instructor's demonstration of these non-verbal actions in the classroom is increased if the instructor interacts digitally with them on Twitter. This finding is compelling because the scale measures solely in class, non-verbal behaviors. Fully understanding the impact of technology on non-verbal communication, in relation to the classroom as well as other forums, can help

educators harness social media tools for maximum instructional benefit. Therefore, more research is warranted describing impacts of technology on perceptions of non-verbal communication.

For example, the use of a validated nonverbal immediacy scale could highlight the potential of social media as a supplement or complement to nonverbal communication. Another potential research avenue might surround the issues of credibility development in online spaces. Yet another angle might relate to content relevance as researchers attempt to understand how experts in a field can use social media to make their subject matter relevant to widespread audiences.

This study has demonstrated a possible relationship between Twitter use and positive student perceptions of teacher behaviors. Instructor availability outside the classroom in many forms has routinely offered this positive result. However, many strategies like office hours, meetings in informal learning spaces, and email have been one-to-one avenues of communication. In contrast, Twitter offers a vehicle to engage with many students at once. This one-to-many (or many-to-many) communication channel may offer instructors an opportunity to efficiently contact and create learning opportunities for many students at once. Future research might suggest means for utilizing digital, one-to-many vehicles like Twitter as supplements for one-to-one personal interactions in the classroom.

The lack of correlation between planned continued use of Twitter and perceptions of immediacy, content relevance, and credibility suggests that using Twitter as a classroom requirement may benefit the class, even if students do not appreciate the tool itself. The lack of a statistically significant relationship on this variable may indicate that, while using Twitter as a classroom tool may improve some student perceptions of teacher behavior, those improvements occur irrespective of a student's desire to continue using Twitter. Further research might investigate improvements that occur between classrooms that require Twitter, those that provide it as an optional resource, and those which use Twitter only for non-class items. Some students even commented, "[Twitter] is an interesting tool for the classroom," and "I think more professors should try to incorporate [Twitter] into the classroom."

In sum, Twitter provides another avenue for interaction between instructors and students. This study demonstrated a positive relationship between use of this communication channel and student perceptions of positive teacher behaviors. Instructors who are hesitant to incorporate this technology into the classroom might now consider the possibility that Twitter might provide opportunities for development and the creation of student-instructor shared experiences. Yet, the issues of privacy, broadcast media, and planned continued use emerged as complicating issues that could be assessed

in relation to classroom use of Twitter. The possibility for future research into the relationship between Twitter and teacher behavior, student learning, and other instructional communication goals appears to be a fruitful avenue for further study.

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