The Benefits of Social Media in Marketing Education: Evaluating Twitter as a Form of Cognitive Flexibility Hypertext

Shannon B. Rinaldo, Debra A. Laverie, Suzanne Tapp and William F. Humphrey, Jr.

Purpose of the Study: Our research examines the use of Twitter as a Cognitive Flexibility Hypertext (CFH) environment integrated into existing marketing courses to assist in achieving course level learning objectives and contribute to education goals and career preparation. By interacting with marketing in real time, Twitter provides a complex environment where students should engage deeply with the material; gain a deeper understanding of marketing in general and social media marketing in particular. Employing adaptive scaffolding, wherein professors guide students through the learning process, allows students to realize these outcomes. This paper examines student attitudes and evaluations after using social media in this context.

Method/Design and Sample: Advanced students enrolled in upper level marketing courses were required to use Twitter during the duration of the course in which they were enrolled. Self-report measures of intrinsic factors and perceived benefits of Twitter were collected from students. Grades in the course provide an objective measure.

Results: Results indicate students who engaged with Twitter throughout the semester perceived Twitter to be beneficial, were more satisfied, more involved, more motivated, and earned higher grades than those who did not. Students who followed the professor gained additional benefit. Twitter as a CFH environment is perceived as beneficial by students.

Value to Marketing Educators: Understanding how Twitter and other social media platforms operate as CFH environments informs professors seeking guidance to integrate social media into course content. Further, understanding how students perceive the use and benefit of complex, ill-structured environments assuages concern professors may have about using unpredictable and ambiguous pedagogical methods.

Keywords: Twitter, Social Media, Cognitive Flexibility Hypertext

Shannon B. Rinaldo (email: Shannon.Rinaldo@ttu.edu) is Assistant Professor of Marketing, **Debra A. Laverie** (email: Debbie.Laverie@ttu.edu) is Senior Associate Dean, Jerry S. Rawls Professor, and Minnie Stevens Piper Professor of Marketing, **Suzanne Tapp** (email: Suzanne.Tapp@ttu.edu) is Director of the Texas Tech Teaching, Learning, and Professional Development Center, **William F. Humphrey, Jr.** (William.Humphrey@ttu.edu) is Ph.D. Student, The Jerry S. Rawls College of Business, Texas Tech University.

Today's graduates and future marketers must be prepared to create and adapt effective marketing campaigns using new and ever changing media technologies. The literature offers examples of the various social media platforms in use, including YouTube (Payne, Campbell, Bal, & Piercy, 2011), Second Life (Halvorson, Ewing, & Windisch, 2011), Facebook (Granitz & Koernig, 2011), Foursquare (Humphrey & Laverie, 2011), and Twitter (Lowe & Laffey, 2011; Rinaldo, Tapp, & Laverie, 2011). As new technology is introduced in the classroom, educators have an opportunity to reflect on their own pedagogical beliefs about how learning works and how the incorporation of a new method will change the learning environment.

Cognitive Flexibility Hypertexts (CFH) are "constructivist learning environments that stimulate creative and critical thinking by allowing users to look at the same problem-situations from multiple perspectives within a self-controlled, interactive environment" (Lima, Koehler, & Spiro, 2004, p. 375). Jacobson & Spiro (1994) discuss CFH as a complex and ill-structured domain where advanced learners are expected to develop sophisticated understandings of course content. Social media, and Twitter in particular, provides a unique CFH environment for learning. Advanced marketing students should already have a basic understanding of social media; however, these students are unlikely to understand how marketing operates within the social media space. Providing the opportunity for students to observe marketing in real-time within a complex and ill-structured domain such as Twitter allows students to learn course concepts within the context of an actual marketing space (Jacobson & Spiro, 1994).

Most of the literature in social media in the classroom has focused on its role in experiential learning (Kolb, 1984). For example, Rinaldo et al. (2011) suggest that Twitter provides a mechanism for faculty to connect with students and participate in

experiential learning. Halvorson et al. (2011) consider the spontaneous and natural interactions among students in an experiential learning scenario via Second Life. The connection to experiential learning and the ability to transfer a newly learned skill (marketing via YouTube videos) to other learning situations is noted by Payne et al. (2011).

Twitter is increasingly used in the classroom (Rinaldo et al., 2011). On Twitter, individuals post comments or information in 140 characters or less. Individuals may tweet new material, retweet the tweets of others, or reply to the comments of others. Tweets are automatically seen by anyone who follows the individual who tweets. Twitter is used by brands, news organizations, and other consumer-facing entities to disseminate information to followers, many of whom may be customers (*New York Times*, 2011; 2012). Since late 2010, Twitter usage has quadrupled to a level where 15 percent of online adults use Twitter (Smith & Brenner, 2012). Twitter has evolved into a "tool to take the pulse of the planet" and students master the technology by using it, reports Twitter founder Jack Dorsey (Swartz, 2012).

Cognitive Flexibility Hypertext originated in Cognitive Flexibility Theory (CFT). CFT has roots in the constructivist educational domain, the same foundation as experiential education and active learning (Strauss, 2011). In constructivist learning, students transform knowledge through a process of active construction (Chieu, 2007). Within constructivist learning, CFT addresses how students learn when knowledge is being applied within uncertain, dynamic conditions through non-linear hyperlinked digital media (Lowrey & Kim, 2009). CFT focuses heavily on how students transfer knowledge and skill beyond their initial learning experiences. Studies of CFT explore how the interconnectedness of concepts within an unstructured environment (such as social media) requires students to think flexibly and integrate classroom concepts in new and different environments (Eveland, Marton, & Seo, 2004). CFT emphasizes the types of learning necessary when knowledge is applied within uncertain, changing environments such as online media (Lowrey & Kim, 2009). CFH, specifically, are best suited for advanced learners (such as college students) who are ready for learning content on a more comprehensive level (Jacobson & Spiro, 1994). Students make these connections best when guided by the professor throughout the process (Azevedo et al., 2005). With the professor's guidance, Twitter provides a unique opportunity for students who have a basic understanding of marketing and social media to work within this CFH where a deeper understanding for the interaction between marketing and social media will emerge.

Introducing Twitter in the classroom provides students the opportunity to learn course content in a more complex, integrated environment. Providing direction throughout the semester provides a structure for transitioning from existing marketing knowledge to understanding social media marketing. This does not mean, however, that students enjoy the use of Twitter or that its use is perceived by students as beneficial. Our research examines the use of Twitter as a Cognitive Flexibility Hypertext (CFH) environment integrated into existing marketing courses to assist in achieving course level learning objectives and contribute to education goals and career preparation. By interacting with marketing in real time, Twitter provides a complex environment where students should engage with the material in a complex manner; gain a deeper understanding of marketing in general and social media marketing in particular. This paper examines student attitudes and evaluations after using social media in this context and extends previous work to examine effects on student grades.

CONCEPTUAL FRAMEWORK AND RESEARCH QUESTIONS

Cognitive Constructivism is a Piagetian approach, which suggests that the most successful learning occurs when students actively construct knowledge and understanding (Chieu, 2007). Although the mere inclusion of interactive technologies are not thought to improve learning (Lima et al., 2004), implementing CFH allows students to critically evaluate consumer marketing, marketing strategy, and brand awareness strategy in real time. In other words, students have the opportunity to critically examine the use of traditional marketing concepts within a dynamic social media context. Therefore, when students engage with the material in this manner, they develop a deeper understanding of the concepts, preparing them to flexibly apply knowledge within a variety of new situations (Chieu, 2007).

Based on the assumptions of CFT, students organize marketing concepts in long-term memory and these concepts are called into working memory when needed. Unfortunately, the marketing related information stored in long-term memory during traditional lectures is less helpful to the student than concepts experienced through a variety of real-world cases and diverse situations (Laverie, 2006). While in-class instruction provides a cohesive and structured body of knowledge (Lowrey & Kim, 2009), Twitter and other social media platforms provide students a self-controlled environment where they can interact with companies and witness marketing in action. Further, students can interact with one another, the professor, companies, consumers, and brand communities in real time in order to gain multiple perspectives and transform their previously learned knowledge from a linear mental structure to interconnected structures. Twitter allows students the opportunity to post their own examples of course concepts and engage in course related discussion both on Twitter and in class. Since companies and consumers are using Twitter as a marketing medium, it provides students with a dynamic context for developing a deeper understanding of course material by tweeting in and outside the classroom.

Millenial students, also called the "net-generation" (Howe & Strauss, 2003), have been immersed in CFH environments and have grown accustomed to these ill-structured, dynamic platforms that require cognitive flexibility. McGlynn (2008) sees this as a barrier between students and professors, suggesting, "we need to master the same technologies our students know in order to use the technologies they are comfortable with" (p. 22). The use of interactive technologies for learning traditional business concepts has resulted in improved student satisfaction (Eastman, Iyer, & Eastman 2011) and better career preparation (Lowe & Laffey, 2011). The current technology-centric environment and millennial students today dictate the use of these social technologies; it is the new norm.

Adaptive scaffolding is a process by which professors provide structure within the CFH, fostering students in self-regulated learning (Azevedo et al., 2005; Azevedo & Jacobson, 2008). This guiding process allows students to learn at a level that was previously slightly beyond their grasp (Dillon & Jobst, 2008) and has been shown to be the most effective form of scaffolding for college students engaging in self-regulated learning (Azevedo et al., 2005). Within the context of Twitter, adaptive scaffolding may consist of a short tutorial early in the semester and gradual increased complexity throughout the course.

Exposure to an environment where students make connections among previously learned marketing concepts increases involvement with these traditional marketing concepts by increasing the ability to think flexibly and critically (Hunt & Laverie, 2004). Further, student involvement with technology in the traditional classroom has been shown to affect student achievement (Tamim, Bernard, Borokhovski, Abrami, & Schmid, 2011). Higher involvement in active learning in general has been linked to improved student grades (Laverie, 2006). Twitter use in the classroom has been linked to a variety of student outcomes including satisfaction, student reactions, traditional educational goals, career preparation, and contributions to course content (Rinaldo et al., 2011). Therefore, in line with this previous research, H1 predicts:

H_1: Students who have used Twitter actively (vs. those who have not) for class will:

a) be more satisfied with the experience of using Twitter,
b) have higher involvement with Twitter,
c) have more positive attitudes and reactions toward Twitter,
d) see more benefit to traditional educational goals, career preparation, and contributions to the course.

Interdependence and shared responsibility between the instructor and student are positively related to responsibility for student learning and are positively related to attitudinal, emotional, and behavioral responses toward the marketing education experience (Sierra, 2010). Students engaging with course concepts through Twitter use are more likely to have higher confidence in their ability, master tasks, develop career required skills, have higher involvement and satisfaction in the course, be more intrinsically motivated, understand how the activity is related to the course learning objectives and perform better in the course (Hunt & Laverie, 2004; Laverie, 2006). Further, social media use has been tied specifically to student grades (Junco, Heibergert, & Loken, 2011) with evidence that deep, flexible processing of course material within a CFH improves overall performance.

Successful flexible use of course content depends on students' understanding of the purpose of the activity and the engagement in the activity on a regular basis (Laverie, 2006). Mallin, Jones & Cordell (2010) demonstrate that a realistic scenario approach in technology use encourages adoption and increases motivation. Intrinsic motivators such as pleasure, satisfaction, and reward from a task serve students well and promote adaptive behaviors including persistence with a task (Vallerand, 1997). The native Twitter environment, where marketers and consumers are interacting in real time provides a rich technology-laden environment for flexible use of course concepts. Use of Twitter should transform into course related mastery, contribute to higher perceived confidence and career goals, result in higher grades, and be related positively to course learning and involvement (Laverie, 2006; Bicen & Laverie 2009). Past research has demonstrated that use is the driving factor for students to understand and achieve goals of using Twitter in the classroom, so use will be related to mastery of the technology (Twitter) (Rinaldo et al., 2011; Lowe & Laffey, 2011). Therefore, H2 predicts:

H_2: Students who have used Twitter actively (vs. those who have not) for the class will have:

a) higher intrinsic motivation,
b) higher perceived confidence,
c) higher mastery of Twitter,
d) higher grades in the course.

The mere presence of technology in the classroom does not necessarily lead to innovation (Lima et al., 2004), although the influence of technology on student involvement has been shown to affect achievement (Tamim et al., 2011). Those students who tend to adopt new technology (i.e., are more innovative by nature) tend to be more confident in mastering technology, have positive attitudes toward using technology, and are more motivated users (Venkatesh & Davis, 2000). Students who overcome barriers to adoption of Twitter have observed tangible benefits both in the course and in preparation for a career in marketing (Rinaldo et al., 2011). Twitter use by students has also demonstrated a higher level of satisfaction with marketing courses (Rinaldo et al., 2011). Accordingly, use of Twitter should transform into course related mastery, contribute to satisfaction,

higher involvement, positive attitudes, career goals, result in higher grades, be related positively to course learning, and should drive intrinsic motivation (Laverie, 2006; Bicen & Laverie, 2009). Willingness to engage with technology should result in students' flexible engagement with course material within Twitter. Therefore, H3 predicts:

H_3: Students who are likely to adopt new technology (vs. those who are not) will:

e) be more satisfied with Twitter,
f) have higher involvement in the course,
g) have more positive attitudes and reactions to Twitter,
h) see more benefit to traditional educational goals, career preparation, and contributions to the course,
i) have higher intrinsic motivation,
j) have higher perceived confidence,
k) demonstrate higher mastery of Twitter.

Although there is likely to be some specific benefit for students who tend to adopt new technology due to their likelihood to engage in cognitive flexibility within the CFH space, previous research has shown that benefits of Twitter use for students did not depend on the level of student innovativeness. Specifically, this research showed that use alone, and not tendency to adopt new technology, drove student benefits (Rinaldo et al., 2011). Therefore, H4 predicts:

H_4: Benefits of use will not depend on students' tendency to adopt new technology.

CFT suggests that learning is most successful when students are applying knowledge to new situations independently (Lima et al., 2004). However, there is evidence that limited guidance may help students to identify which information is essential for building cognitive scripts that will help students navigate a CFH such as Twitter (Lowrey & Kim, 2009). Use of Twitter, as a form of active learning, should transform into course related mastery, contribute to higher satisfaction, involvement, and positive attitudes (Laverie, 2006; Bicen & Laverie, 2009). Social media research has shown that its use enhances student confidence, task mastery intrinsic motivation, perceived competence and contributes to educational and career goals (Bicen & Laverie, 2009; Rinaldo et al., 2011). In particular, it is posited that following professors further enhances the strength of benefits realized via Twitter use. Therefore, H5 predicts:

H_5: Students who follow professors on Twitter (vs. those who do not) will perceive significantly higher:

a) satisfaction with Twitter,
b) course learning objectives,
c) involvement with the course,
d) attitudes toward the course,
e) intrinsic motivation,
f) perceived confidence,
g) mastery of Twitter,
h) benefit for traditional educational goals, career preparation, and contributions to the course.

METHOD

Students in two classes, Services Marketing (SM) and Consumer Behavior (CB), at a Southwest university were required to set up Twitter accounts and then "follow" the professor teaching the course. A short tutorial on how to use Twitter and how Twitter would be used in the course was given in the second week of class on the deadline by which students were supposed to sign up to use Twitter. Throughout the semester the professor used Twitter to "retweet" examples of articles, marketing strategies, and company tweets that demonstrated course principles. These tweets were later integrated into class discussion as examples of both course content and social media project resources. Twitter was also used to communicate directly with the class and individual students about course-related issues. Both courses contained a major service learning group project for which social media evaluations and recommendations were strongly encouraged through instruction to critique the each company's social media strategy and make recommended changes (i.e., to encourage flexible use of course concepts within the Twitter environment). As the semester approached the point of project completion, Tweets and in-class discussion of social media were more focused on social media marketing for specific projects in an effort to assist students in evaluating the social media strategy of the companies in the individual projects. Frequency and quality of student tweets was not monitored at an individual level.

Students were surveyed in the last week of the semester regarding Twitter. The students completed the survey with an online survey tool using existing scales. Instructions for the survey stated 1) honest responding helps professors design effective courses in the future and 2) data would not be examined until after grades had been submitted for the current semester. Students were compensated with required research participation credit (as part of a college-wide undergraduate research pool) for completing the survey. The college-wide research pool is maintained by a graduate student coordinator and is not linked directly with these courses. The research pool coordinator collects student ID numbers from students for credit granting purposes. An independent teaching assistant used the anonymous student ID numbers to link student grades with survey responses after the conclusion of the semester. Both lists for grades and survey responses contained only the student ID number. Consent forms stated that survey responses may be tied to grades after the conclusion of the semester. The same professor taught both courses and students were unaware at the beginning of the

semester that they would later be surveyed about Twitter.

Participant Characteristics

A total of seventy-one (N = 71) students completed the survey for a response rate of 54.6%. Both courses were capped at 65 students, and response rates for each course did not differ significantly (N_{SM} = 38 and N_{CB} = 33). Two students were dropped from the analysis due to missing data. The research questions examine high and low users and not non-users; therefore, nine participants were omitted for answering "no" to the question "Do you use Twitter?" Sixty (N = 60) participants were used for the main analysis.

Of the remaining participants, 22 were enrolled in CB, 31 were enrolled in SM, and 7 were enrolled in both courses simultaneously. The sample was comprised of 57% female (N = 34) and 43% male (N = 26) students. Ages ranged from 20-31, (M = 21.9), GPA ranged from 2.75-3.95 (M = 3.29), students were primarily at senior (N = 51) and junior (N = 9) levels. All students passed the course they were enrolled in, grades ranged from 71.9-95.6 (M = 87.8). One grade was recorded for students enrolled in both courses. This score was an average across the two courses.

Surveys

Independent Variables (IVs). Regardless of the Twitter use requirement, student use varied during the semester. Use of Twitter was operationalized with the question "How long would you say you've been using Twitter regularly?" Participants selected one of the following: "I do not use Twitter regularly," "This semester," "One year," "More than a year." These responses were aggregated into a dichotomous (0/1) variable. Students who endorsed "I do not use Twitter regularly" were coded "0" and other responses were coded "1." Text for all items and scale reliabilities are given in Table 1. A five-item domain-specific innovativeness scale (α = .86) (Goldsmith & Hofacker, 1991) measures the tendency to learn and adopt new products or innovations (Bearden, Netemeyer, & Mobley, 1993). High versus low innovation (tendency to adopt new technology) was computed using a high/low (1/0) median split (median = 4.2).

Table 1: Scale Items and Reliability

Independent Variables			
Scale	**Citation**	**Items**	**α**
Innovativeness	Goldsmith & Hofacker 1991	1. In general, I am among the first in my circle of friends to know about the latest technology. 2. If I heard that a new high tech product was available to buy, I would be interested enough to buy it. 3. Compared to my friends, I own a lot of high tech devices. 4. In general, I am among the first in my circle of friends to know about the latest technology. 5. I know about the latest technology coming out before other people do.	.86
Frequency/Type of Use		1. Do you use Twitter? 2. How long have you had a Twitter account? 3. How long would you say you've been using Twitter regularly? 4. How often do you Retweet other peoples' Tweets? 5. How often do you reply to or comment on a Tweet?	N/A
Intrinsic Motivation	Bicen & Laverie 2009	1. Using Twitter for this class has been pleasurable and satisfying. 2. Learning how to use social media has been pleasurable and satisfying. 3. Engaging in Twitter makes classes exciting and challenging. 4. I have experienced positive feelings because I learned about and used Twitter in my classes.	.882
Perceived Confidence	Bicen & Laverie 2009	1. I feel confident using Twitter in class activities, discussions, and participation. 2. I feel confident using Twitter for group assignments and group work. 3. I feel confident using Twitter for individual requirements, papers, and assignments. 4. I feel confident using Twitter for formal evaluations like quizzes and exams. 5. I feel confident using Twitter to understand the concepts and application of concepts to the real world.	.925
Task Mastery	Bicen &	1. I felt successful in this class when I acquired new knowledge	.746

	Laverie 2009	and skills regarding social media. 2. I felt successful in this class when I learned from my mistakes with social media. 3. I want to learn and understand as much as possible from this course about social media. 4. I prefer class work that is challenging so I can learn many new things. 5. To me comprehending how to use social media is more important than the grade I get.	
Contribution to Career Goals	Li, Greenberg, & Nichols 2007	1. Overall, Twitter has helped me to develop my career skills. 2. Twitter serves as a good surrogate for real world experience.	.803
Job Search Preparation		1. I plan to include my social media knowledge on my resume. 2. I plan to discuss my social media knowledge during job interviews. 3. I don't think social media knowledge will help me get a job.(R) 4. I don't think social media will be something I will need to know when I have a job.(R)	.799
Learning Objectives		1. Social media use helps me to critically evaluate consumer behavior for myself and others. 2. Social media use helps me understand the interactions between cognition, affect, and behavior. 3. Social media use helps me to predict market conditions that contribute to consumption decisions. 4. Social media helps me explain how marketing interacts with cultural norms. 5. Social media use helps me assess ethical implications of marketing strategy. 6. Social media use helps me understand the marketing solutions of services. 7. Social media use helps me identify how services target consumer segments. 8. Social media use helps me understand how services segment in a global economy. 9. Social media use helps me identify where shortcomings may occur in the service experience. 10. There has been at least one time that I have seen something on Twitter from the instructor or other students that caused me to think more in depth about consumer behavior.	.848
Contribution to the Course	Rinaldo, Tapp, & Laverie 2011	1. I'd like to see Twitter used in more classes. 2. Using Twitter outside of class helps me look forward to lecture. 3. Twitter is much more useful for the course than I thought it would be. 4. Using Twitter to discuss course examples has made me interested in the topic. 5. My group uses Twitter to organize and discuss our project. 6. I have not found a use for Twitter either inside or outside of my studies.(R) 7. Using Twitter for class helps me to get to know the professor better.	.859
Traditional Educational Goals	Li, Greenberg, & Nichols 2007	1. Twitter helps me understand the material. 2. Twitter helps me feel like "I learned a lot". 3. Twitter improves my competency in the course content area. 4. Twitter aids in achieving high educational value overall.	.921
Involvement & Satisfaction	Li, Greenberg, & Nichols 2007	1. Twitter aids in producing a high level of involvement in the course. 2. Twitter aided in achieving overall satisfaction with the course.	.835
Student Reactions	Ueltschy 2001	1. I think Twitter is fun to use. 2. I believe my skill in working with groups has improved from working with Twitter. 3. I am able to understand the material better using Twitter.	.894

		4. I think the integration of Twitter into the course material has made this class more enjoyable. 5. I believe the use of Twitter has helped me seriously consider differing points of view. 6. I believe the use of Twitter has done nothing to enhance the understanding I gained from this course.(R) 7. I would recommend that the instructor use Twitter in the course again next semester. 8. Overall, I would rate the use of Twitter in class very highly.	
Who Students Follow		1. I stay in touch with my friends using social media such as Twitter and Facebook. 2. On Twitter, I follow (check all that apply)	N/A
Perceptions of generation		1. I believe that my generation is more tech-savvy than past generations.	N/A

Dependent Variables (DVs). Self report surveys were also used to assess the dependent variables. Five items were modified from Bicen & Laverie (2009) to measure perceived confidence of using Twitter (α = .925). Five items measuring task mastery orientation (α = .746) were also modified from Bicen & Laverie (2009). The item modification did not change the constructs measured by the items, however, item wording was changed to be clear to students that these items were referring to their use of Twitter for the course. A two-item measure of contribution to career goals (r = .803) was used (Li, Greenberg, & Nichols, 2007). Personal involvement and satisfaction were measured with two items (r = .835) (Li et al., 2007). Four items measured achievement of traditional educational goals (α = .921) (Li et al., 2007). Four items measured intrinsic motivation (α = .882) (Bicen & Laverie, 2009). Eight items measured student reactions (α = .894) (Ueltschy, 2001). Seven items measured student evaluations of Twitter's contribution to the course (α = .859) (Rinaldo et al., 2011). All of these surveys were measured on a 7-point Likert scale where 1 = "Strongly Disagree" and 7 = "Strongly Agree."

Four items were used to assess students' plans to use Twitter experience in job search preparation (α = .799). Ten items were constructed from the stated course objectives as listed on the course syllabi. These items measured how the use of social media resulted in achieving the course learning objectives (α = .848). One item was asked to assess whether students perceive their generation as tech savvy. All of these surveys were measured on a 7-point Likert scale where 1 = "Strongly Disagree" and 7 = "Strongly Agree." Two items gathered descriptive information about who students follow on Twitter. One item, "I stay in touch with my friends," was measured on a 7-point scale. The other item, "On Twitter, I follow," offered six categories: friends, family, professors, celebrities, companies, and other. Participants were to select all that applied.

RESULTS

Descriptions of Participant Type of Twitter Use

When asked how long Twitter had been used regularly, about 1/3 (N = 22) chose "I do not use Twitter regularly," 1/3 (N = 23) chose "This semester," and the remainder (N = 15) had been using it regularly for a year or longer. Sixty-five percent (N = 39) began using it because of a class requirement. Eighty-seven percent (N = 52) reported that they follow professors, 78% (N = 47) friends and celebrities, and 71% (N = 43) companies.

When asked to identify all of the ways that they accessed Twitter, 72% accessed Twitter via the web and 97% via smartphone. When asked to include information on the brand of smartphone, the majority reported using the Apple iPhone (N = 25), others (N = 10) reported using another brand of smartphone (no other brand had more than three users), and the remainder did not include a brand of phone (N = 25). When asked the purpose for using Twitter, 70% endorsed professional use, 97% endorsed school use, 92% endorsed personal use, and 30% endorsed other purposes (students were to endorse all that applied).

Tests of Hypotheses

A one-way analysis of variance (ANOVA) was used to examine differences between high versus low regular use on dependent variables. Results indicate significant mean differences, students who used Twitter regularly were: more satisfied ($F = 5.607$, $p < .05$; $M_{High} = 5.24$, $M_{Low} = 4.32$); had a higher level of involvement ($F = 6.746$, $p < .05$; $M_{High} = 5.37$, $M_{Low} = 4.5$); had more positive attitudes about Twitter ($F = 14.272$, $p < .0001$; $M_{High} = 5.76$, $M_{Low} = 4.39$); had more positive reactions to Twitter ($F = 14.070$, $p < .0001$; $M_{High} = 5.29$, $M_{Low} = 4.22$); rated Twitter as being beneficial to obtaining educational goals ($F = 8.611$, $p < .01$; $M_{High} = 4.7$, $M_{Low} = 3.69$); beneficial to career preparation ($F = 9.086$, $p < .01$; $M_{High} = 4.92$, $M_{Low} = 3.91$); and having higher contributions to the course ($F = 8.829$, $p < .01$; $M_{High} = 4.9$, $M_{Low} = 3.9$). Therefore, consistent with previous research, H1 was supported.

Results of a one-way analysis of variance (ANOVA) used to test H2 showed significant differences on dependent variables as well. Students using Twitter regularly were: more internally motivated ($F = 9.615$, $p < .01$; $M_{High} = 5.53$, $M_{Low} = 4.69$); higher

in perceived confidence (F = 15.177, p < .0001; M_{High} = 5.19, M_{Low} = 1.39); and higher in task mastery (F = 9.247, p < .01; M_{High} = 5.41, M_{Low} = 4.66) than those who did not use Twitter regularly. Grades were marginally significant (F = 3.281, p = .07; M_{High} = .89, M_{Low} = .86) but still noteworthy.

A MANOVA was calculated to test H3. Innovativeness, or tendency to adopt new technology, was only marginally related to satisfaction with Twitter (F = 3.332, p = .073) and involvement with the course (F = 3.247, p = .077), H3a and H3b, respectively. Innovativeness was significantly related to all other DVs hypothesized in H3 except for task mastery (F = 1.78, p = .187). Statistically significant results were found for: student reactions to Twitter (F = 8.837, p < .01); contribution to traditional educational goals (F = 5.282, p < .05); career preparation (F = 5.538, p < .05); contributions to the course (F = 5.657, p < .05); intrinsic motivation (F = 5.791, p < .02); perceived confidence F = 7.391, p = .01). Therefore, H3c-f were supported, H3a-b were marginally supported, and H3g was not supported. An insignificant correlation between innovation and regular use (r = .028, p = .838) indicates that the benefits of Twitter use are not dependent on innovativeness, supporting H4.

A Multivariate General Linear Model (GLM) tested if the DVs in question changed in relation to who the students followed on Twitter. In partial support of H5, there was a marginal main effect for following professors (Hotelling's corrected F = 2.03, p = .053) on several DVs. Those who followed professors on Twitter (versus those who did not) had higher overall satisfaction with Twitter (F = 4.06, p < .05), H3a. Significant results were also found for Twitter's contribution to learning course objectives (F = 9.716, p < .01), H3b. Twitter's contribution to traditional educational goals, H3h, were marginally significant (F = 3.782, p = .058) as was Twitter's influence on internal motivation (F = 2.842, P = .09), H3d. See Table 2 for a summary of the results.

Table 2: Results and Significance

H_1: One-way ANOVA examining satisfaction, involvement, attitudes and reactions, and contribution to education goals, career preparation, and to the course of those regularly using Twitter

	F	**P**	**M_{High}**	**M_{Low}**
Satisfaction with Twitter	5.607	< 0.05	5.24	4.32
Higher involvement	6.746	< 0.05	5.37	4.5
Attitude to Twitter	14.272	< 0.0001	5.76	4.39
Reaction to Twitter	14.07	< 0.0001	5.29	4.22
Beneficial to educational goals	8.611	< 0.01	4.7	3.69
Beneficial to career preparation	9.086	< 0.01	4.92	3.91
Contributed to course	8.829	< 0.01	4.9	3.9

H_2: One-way ANOVA examining motivation, confidence, mastery, and performance of those regularly using Twitter

	F	**P**	**M_{High}**	**M_{Low}**
More internally motivated	9.615	< 0.01	5.53	4.69
Perceived confidence	15.177	< 0.001	5.19	1.39
Contribution task mastery	9.247	< 0.01	5.41	4.66
Higher course performance (Grades)	3.281	= 0.07	0.89	0.86

H_3: MANOVA examining high v. low likeliness to adopt technology and satisfaction, involvement, positive attitudes and reactions, benefits to education goals, career preparation, and course

contribution, intrinsic motivation, confidence and mastery

	F	P
Satisfaction with Twitter	3.332	= .073
Involvement	3.247	= .077
Student Reactions	8.837	< .01
Contributions to Educational Goals	5.282	< .05
Career preparation	5.538	< .05
Contributions to the Course	5.657	< .05
Intrinsic motivation	5.791	< .02
Perceived confidence	7.391	< .01

H_4: Correlation of innovation and regular use of Twitter

	R	P
Internal motivation	0.028	< 0.838

H_5: Multivariate GLM examining differences based on who the students follow on Twitter.

Professors	F	P
Satisfaction with Twitter	4.06	= 0.05
Course objectives	9.716	< 0.01
Beneficial to educational goals	3.782	= 0.058
More internally motivated	2.842	= 0.09

DISCUSSION

Within Cognitive Flexibility Theory, there have been few practical guidelines for how to use Cognitive Flexibility Hypertexts in the classroom (Chieu, 2007). Examining Twitter as a CFH is a genesis for understanding how CFH can enhance the classroom experience by providing a platform within which advanced students can flexibly and critically apply marketing concepts. Further, this study employs an adaptive scaffold, the professor provided structure for student learning by increasing complexity of the social media marketing application over the span of a semester. Within this sample, students who engaged more with Twitter throughout the semester realized a variety of benefits related specifically to their feelings toward Twitter and the course, internal shifts in their own motivations and task mastery, and future-centered goals related to future careers and job interviews. Who students "followed" had a great effect on benefits realized: students who followed professors realized benefit specifically related to attitudes toward Twitter and benefits related to the course itself. This is probably due to the professor's distribution of Tweets about both the course and real-world examples of course content.

Although students' tendency to adopt technology (a level of innovativeness) was related to benefits obtained, this sample was consistent with past literature (Rinaldo et al., 2011) in that use alone contributed greatly to student benefits. Students' final grades for the course were marginally related. The connection to grades is consistent with previous research (Junco et al., 2011), however, without direct experimentation this connection is tentative. This may suggest that Twitter provides a complex environment where students can gain a deeper understanding of course material as they observe marketing in this ill-structured space, characteristics and benefits consistent with those of a Cognitive Flexibility Hypertext (Jacobson & Spiro, 1994).

This research is not without limitations. First, this study failed to capture a clear understanding of the frequency and manner of students' Twitter use. Students use Twitter outside of the physical classroom and on their own time, making it very difficult to measure whether students are simply reading content or interacting in a more complex manner. Future research in this area should include objective measures of use such as: the number of people a student follows on Twitter and the number of people who follow the student on Twitter. Another objective measure might include scraping student tweets with software for content analysis for the period of time the students were enrolled.

A second limitation is the interpretation of this study's conclusions regarding effects of following the professor. Although some dependent variables were marginally supported, other variables likely to be related were unsupported. These findings (and lack of findings) were probably due to a lack of variance or a lack of interaction by students who said they followed

the professor. Students who stated they were following the professor may not have actually engaged with the professor's tweets. Future research would benefit from incorporating assignments that depend on the professor's tweets, thus forcing an interaction. Further, to increase the number of students not following the professor, future research should manipulate who follows the professor between two courses where students in one course are required to follow the professor and students in the other course are given a general assignment to follow marketers on Twitter.

A third limitation may be incentivizing students to complete surveys and the threat of desirable responding by students. In an effort to mitigate this issue, the professor teaching the course submitted the online survey through a college-wide student subject pool. The survey was only available for students enrolled in these specific courses. However, the data were collected and credit given outside the control of the professor teaching the course. Further, instructions for the survey stated that honest responding helps professors design effective courses in the future and data would not be examined until after grades had been submitted for the current semester.

Future research should examine specific social media assignments designed using CFT principles (Chieu, 2007), where students are required to work with particular course concepts within the context of the social media CFH. Researchers should also investigate different styles of adaptive scaffolding within social media assignments to determine which professor guidance styles work best for specific types of assignments in helping achieve specific learning objectives (Jacobson, 2006). While Twitter is considered one ideal CFH environment for marketing courses, other social media platforms may work well for particular assignments or courses. For example, students could observe brand marketing across various social media platforms, critically evaluate the observed strategy within the context of course concepts, and design a multi-platform brand strategy for a real or fictional brand. Such an assignment would require students to integrate concepts in this non-linear, dynamic, real-world environment. CFH offers a structure for marketing professors to use social media to enhance student understanding of course concepts. Social media in general, and Twitter in particular, are catalysts for teaching students how to use traditional marketing concepts within a new and dynamic context of online social media where change is rapid and seamless.

REFERENCES

Azevedo, R., Cromley, J. G., Winters, F. I., Moos, D. C., & Greene, J. A. (2005). Adaptive human scaffolding facilitates adolescents' self-regulated learning with hypermedia. *Instructional Science, 33,* 381-412.

Azevedo, R., & Jacobson, M. J. (2008). Advances in scaffolding learning with hypertext and hypermedia: a summary and critical analysis. *Educational Technology Research and Development, 56,* 93-100.

Bearden, W., Netemeyer, G., & Mobley, M. (1993). *Handbook of Marketing Scales. Multi-item Measures for Marketing and Consumer Behaviour Research*. Newbury Park, CA: Sage Publications.

Bicen, P., & Laverie, D. A. (2009). Group-based assessment as a dynamic approach to marketing education. *Journal of Marketing Education, 31*(2), 96.

Chieu, V. M. (2007). An operational approach for building learning environments supporting cognitive flexibility. *Educational Technology & Society, 10*(3), 32-46.

Dillon, A. & Jobst, J. (2005). Multimedia learning with hypermedia. In *The Cambridge Handbook of Multimedia Learning,* R. Mayer (ed), Cambridge University Press, Cambridge, MA.

Eastman, J. K., Iyer, R., & Eastman, K. L. (2011). Business students. *Journal of Education for Business, 86*(1), 8.

Eveland, W. P., Marton, K., & Seo, M. (2004). Moving beyond "just the facts": The influence of online news on the content and structure of public affairs knowledge. *Communication Research*, *31*(1), 82-108.

Goldsmith, R. E., & Hofacker, C. F. (1991). Measuring consumer innovativeness. *Journal of the Academy of Marketing Scienct, 19*(3), 209-221.

Granitz, N., & Koernig, S. K. (2011). Web 2.0 and marketing education: Explanations and experiential applications. *Journal of Marketing Education, 33*(1), 57.

Halvorson, W., Ewing, M., & Windisch, L. (2011). Using Second Life to Teach About Marketing in Second Life. *Journal of Marketing Education, 33*(2), 217-228.

Howe, N., Strauss, W., Registrars, A. A. O. C., Officers, A., & Associates, L. (2003). *Millennials go to college: Strategies for a new generation on campus: Recruiting and admissions, campus life, and the classroom*: American Association of Collegiate Registrars and Admissions Officers.

Humphrey, W. F., & Laverie, D. A. (2011). Driving frequency with mobile social networks (MSN) and the mediating effects of price and quota promotions. *International Journal of Mobile Marketing, 6*(2), 46–59.

Hunt, S. D., & Laverie, D. A. (2004). Experiential learning and the Hunt-Vitell theory of ethics:

Teaching marketing ethics by integrating theory and practice. *Marketing Education Review, 14*(3), 1-14.

Jacobson, M. J. (2006). From non-adaptive to adaptive educational hypermedia: Theory, research, and methodological issues. in *Advances in Web-Based Education: Personalized Learning Environments:* Information Science Publishing Hershey, PA.

Jacobson, M. J. and R. J. Spiro (1994). A framework for the contextual analysis of technology based learning environments. *Journal of Computing in Higher Education, 5(2),* 3-32.

Junco, R., Heibergert, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, *27*, 119-132.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*: Prentice-Hall Englewood Cliffs, NJ.

Laverie, D. A. (2006). In-class active cooperative learning: A way to build knowledge and skills in marketing courses. *Journal of Marketing Education Review,16*(Summer), 59-76.

Li, T., Greenberg, B. A., & Nicholls, J. (2007). Teaching experiential learning: Adoption of an innovative course in an MBA marketing curriculum. *Journal of Marketing Education, 29*(1), 25.

Lima, M., Koehler, M. J., & Spiro, R. J. (2004). Collaborative interactivity and integrated thinking in Brazillian business schools using cognitive flexibility hypertexts: The pantheon project. *Journal of Educational Computing Research, 31*(4), 371-406.

Lowe, B., & Laffey, D. (2011). Is Twitter for the Birds? *Journal of Marketing Education, 33*(2), 183-192.

Lowrey, W. & Kim, K. S. (2009). Online News Media and Advanced Learning: A Test of Cognitive Flexibility Theory. *Journal of Broadcasting & Electronic Media, 53*(4), 547-566.

McGlynn, P. A. (2008), "Millenials in college: how do we motivate them? *Education Digest: Essential Readings Condensed for Quick Review, v73* (6), 19-22.

Mallin, M.C., D. E. Jones & J. L. Cordell (2010), The impact of learning context on the intent to use marketing and sales technology: A comparision of scenario-based and tasked-based approaches, *Journal of Marketing Education*, *32*(2), 214-223.

New York Times (2011). Twitter, 2012. Retrieved from http://topics.nytimes.com/top/news/business/companies/twitter/index.html?scp=1-spot&sq=Twitter&st=cse

New York Times (2012, January 23, 2012). Facebook, 2012. Retrieved from http://topics.nytimes.com/top/news/business/companies/facebook_inc/index.html?scp=5&sq=Facebook growth&st=cse

Payne, N. J., Campbell, C., Bal, A. S., & Piercy, N. (2011). Placing a Hand in the Fire. *Journal of Marketing Education, 33*(2), 204-216.

Rinaldo, S. B., Tapp, S., & Laverie, D. A. (2011). Learning by Tweeting. *Journal of Marketing Education, 33*(2), 193-203.

Sierra, J. J. (2010). Shared Responsibility and Student Learning: Ensuring a Favorable Educational Experience. *Journal of Marketing Education, 32*(1), 8.

Smith, A., Brenner, J. (2012, May 31). Twitter Use 2012 (pp. 2–5). Retrieved from http://pewinternet.org/Reports/2012/Twitter-Use-2012.aspx

Strauss, J. (2011). Marketing capstone models *The Apprentice* television show with client-sponsored projects. *Journal of Marketing Education,33*(3), 312-325.

Swartz, Jon (2012, September 14). Founder of Twitter sees blur of change. *USA Today*, p.4F.

Tamim, R.M., Bernard, R.M., Borokhovski, E., Abrami, P.C., & Schmid, R.F. (2011). What forty years of research says about the impact of technology on learning: A second-order meta-analysis and validation study. *Review of Educational Research, 81*(1), 4-28.

Ueltschy, L. C. (2001). An exploratory study of integrating interactive technology into the marketing curriculum. *Journal of Marketing Education, 23*(1), 63-72.

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. *Advances in Experimental Social Psychology, 29*, 271-360.

Venkatesh, V & F. D. Davis (2000), A theoretical extension of the TAM, *Management Science, 46*(2), 186-204.