Extending the Walls of our Classrooms with Online Informal Learning Environments: An Investigation of Social Media in the Higher Education Classroom

Rebecca S. Putman

Tarleton State University

In many traditional higher education classrooms and learning management systems, there is a teacher-centered pedagogy in which the instructor provides the content, usually in a lecture-style format, and students answer the instructor's questions (Prestridge, 2014). However, considerable research has suggested that a shift to a more learner-centered pedagogy, in which college students engage and collaborate with others in the classroom, increases learning and encourages the creation of knowledge (Goldenberg, 1992; Murphy, Wilkinson, Soter, & Hennessey, & Alexander, 2009; Smith, et al., 2009; Vygotsky, 1962). Traditional learning environments are generally constrained by time and place, and interactions around the class content are limited to the face-to-face meetings and online discussion boards. In an attempt to encourage learning and connections across time and place and in an attempt to create a more participatory and interactive experience for college students, many researchers have suggested the use of social media as a pedagogical and assessment tool in the college classroom (Croxall, 2010; Gao, Luo, & Zhang, 2012; Parry, 2008; Prestridge, 2014). More and more, social media tools are being used to promote a more constructivist paradigm in which learners engage in "knowledge construction, not reproduction; conversation, not reception; articulation, not repetition; collaboration, not competition; reflection, not prescription" (Jonassen, Howland, Moore, & Marra, 2003, p.15).

Background

Personal Learning Networks

With the increase in e-learning and social media, there is a new construct that has entered the higher education classroom—the personal learning network [PLN] (Dabbagh & Kitsantas, 2012). A PLN is an environment in which people, tools, communities, and resources connect and interact (Wilson, 2008). PLNs can be viewed as both a technology and a pedagogical approach that is based on each student's personal learning goals and learning styles. From a pedagogical perspective, a PLN is a set of tools, materials, and human resources that a person purposely chooses for the purpose of life-long learning. (Marin, Negra, & Perez, 2014). As Hall (2009) notes, a PLN is a "personalized aggregation of tools, networks, and content from a range of formal and informal places" (p. 33). A PLN differs from a generic social network in that the intent or context of the network is for personal learning and connections and is dependent on the particular users in the PLN (Wilson, 2008). A PLN is constructed through deliberate choices, based on each individual's goals and interests. Because of the personalized nature of PLNs, they "empower students to take charge of their own learning prompting them to select tools and resources to create, organize and package learning content to learn effectively and efficiently" (Dabbagh & Kitsantas, 2012, p. 4). Specific to teacher education, PLNs encourage preservice teachers to build their pedagogical knowledge and professional capacity by providing them with the opportunity to "build and manage knowledge…[and] create shared language and standards for practice and student outcomes…" (McLaughlin & Talbert, 2006, p.5). The goals of undergraduate preservice teacher PLNs include building pedagogical skills, encouraging reflective practice, building teacher identity, and confronting classroom realities (McLaughlin & Talbert, 2006).

While PLNs are a great way for college students to create a personalized learning experience, not all students have developed the ability to manage and effectively communicate their knowledge. One study on the use of PLNs by college students found that they may not be aware of how to effectively use a PLN in a way that gives them a personalized learning experience (Dabbagh & Kitsantas, 2012). In addition, it is difficult for instructors to model participation and regulate the degree of involvement so that the students develop a truly collaborative and interactive network (Marin, Negre, & Perez, 2014)

While PLNs do have several challenges, there are also many documented advantages. PLNs allow students to manage information and knowledge, create content, and connect with experts and others (Dabbagh & Kitsantas, 2012; Marin, Negra, & Perez, 2014). Furthermore, they allow creative problem-solving, opportunities to locate and evaluate relevant facts and information, and communication of ideas. These connections with others encourage participants to adopt new perspectives, debate points of disagreements, and present new knowledge (Marin, Negra, & Perez, 2014). As Dabbagh and Kitsantas (2012) note, "students aggregate and share resources, participate in collective knowledge generation, and manage their own meaning making" (p. 3). This process encourages students to develop skills that allow them to self-regulate their learning in higher education contexts (Dabbagh & Kitsantas, 2012). Furthermore, because of the personalized nature of PLNs, they appeal to various styles of content and learning, including watching, thinking, and trying (Hall, 2009). PLNs can take on many forms; however, one way that college students can form a PLN is by creating an informal learning environment, outside of the traditional classroom.

Informal Learning Environments

Informal learning environments occur outside the context of a formal classroom and provide opportunities for students to interact without the structure or time constraints of a more traditional environment. The main differences between the formal and informal learning environments lies in students' perception of choice, access, and control (Tan, 2013). While formal learning environments assign grades and control much of the content, most of the learning decisions in informal learning environments are made by the learner and usually revolve around common interests or goals (Dabbagh & Kitsantas, 2012; Tan, 2013). There are several definitions and ideas surrounding the concept of informal learning environments, but some of the common attributes of an informal learning environment include:

1. a learner-maintained and directed environment;
2. an informal structure and timetable;
3. non-institutional technologies;
4. learning that occurs outside of traditional, formal learning contexts; and,
5. a non-threatening and explorative environment (Hall 2009; Tan, 2013).

On the other hand, traditional, formal learning environments are spaces in which personal learning often occurs face-to-face. These environments are typically highly structured, have required assignments, are facilitated by an instructor, and have some type of external or institutional controls (Dabbagh & Kitsantas, 2012; Hall, 2009). Higher education institutions are still primarily relying on these traditional formal learning environments "…leaving little room for learners to manage and maintain a learning space that facilitates their own learning activities as well as connections to peers and social networks across time and place" (Dabbagh & Kitsantas, 2012, p.2). Many have argued that while formal learning environments offer numerous advantages, more learning needs to take place outside the classroom so that students can observe, apply, and share knowledge in authentic contexts.

The argument for integrating informal learning environments into the higher education classroom is compelling. Dabbagh and Kitsantas (2012) found that uncoordinated and independent learning activities could explain around 80% of individuals' knowledge about their jobs. Considerable research has found that learning is most effective when students engage in both formal and informal learning environments (Dabbagh & Kitsantas, 2012).

One of the challenges is fusing students' formal and informal learning environments meaningfully in a way that maximizes their learning and encourages the creation and distribution of knowledge. The goal in connecting these informal and formal learning environments is to give students the skills and confidence in using and creating knowledge within new contexts. Because of the emphasis on helping students develop novel skills, the fusion of these two environments is now seen as a necessity. Recent research has shown that informal online environments are rarely seen as a separate component of formal learning environments; instead, learners view e-learning as an integral part of their institutional and personal learning (Deng & Tavares, 2015; Hall, 2009). As Hall (2009) notes, "Empowering learners to design and deploy fused, formal and informal educational spaces not only extends the power of situated, individual, educational outcomes, but can also positively extend their personal learning experiences" (p.30).

Social Media

More and more, there is a blurring of boundaries between personal, social, and formal learning environments—social media and other Web 2.0 tools can be used to fuse these environments and increase learning (Hall, 2009). Social media is a term that broadly defines a

variety of tools and technologies that emphasize social interaction, communication, collaboration, and transactions (Dabbagh & Kitsantas, 2012). These social media tools encourage autonomous, self-regulated, informal learning where students can create, organize, and share content and knowledge (Cain & Policastri, 2011; Hall, 2009). As Dabbagh and Kitsantas (2012) note, "There is strong evidence that social media can facilitate the creation of [PLNs] that help learners aggregate and share the results of learning achievements, participate in collective knowledge generation, and manage their own meaning making" (p.3). Social media in the higher education classroom can help students accomplish these goals, and it empowers college students because they have agency over their learning. As a result, social media is a great tool to fuse situated, formal learning environments (such as the face-to-face classes) with more informal learning environments.

Considerable research already shows that college students are integrating social media into their learning experiences both formally and informally (Dabbagh & Kitsantas, 2012; Garcia, Elbeltagi, Dungay, & Hardaker, 2015). Because of the utility and ubiquity of social media, there has been an increasing desire to explore the ways in which social media can be used effectively in (and out) the classroom to maximize learning. Cane and Policastri (2011) note that the "[a]ttributes of openness, collaboration and user-generated content, combined with social media's immense popularity among college-aged students" have made the use of social media in the classroom very attractive to college instructors (p. 1). Research supports students becoming active co-producers of course content. Web 2.0 technologies, particularly social media, are encouraging a pedagogical transformation in which students create personal learning environments that integrate the formal learning that occurs in the classroom with the more learner-centered, informal learning environment (Dabbagh & Kitsantas, 2012; Hall, 2009). This repurposing of social media for academic reasons allows students to create socially-constructed knowledge that is hybridized with the more formal knowledge from the classroom (Dabbagh & Kitsantas, 2012; Hall, 2011; Tan, 2013).

There is limited research on the use of most social media applications in the higher education classroom. Most of the previous studies have focused on the use of social media for non-educational purposes. Studies that have focused on the use and effects of social media in the higher education classroom have produced somewhat mixed results, and the limited scope and number of studies make it difficult to draw definitive conclusions.

Facebook. One study on the use of Facebook in the higher education classroom found that students were typically more comfortable with online interactions than with face-to-face interactions, which meant that many of them were more likely to state their opinion and disagree with others online (Deng & Tavares, 2013). Another study suggested that the use of Facebook by students results in informal learning because of the discussions that take place within an informal learning community (Garcia, Elbeltagi, Dungay, & Hardaker, 2015). Within the informal learning community, this same study noted that students use Facebook to gain support and get information and ideas from other students. Another study found that students who used a Facebook group to expand course content and cover topics that were not covered in class said that the experience was beneficial for learning and broadened their exposure to topics not covered in class (Cain & Policastri, 2011). Furthermore, these students noted that they appreciated the guidance and opportunity to practice professional communication in an informal learning environment (Cain & Policastri, 2011). While some researchers have found that students who use Facebook in the classroom find it more difficult to communicate in class, are more distracted, and have a hard time paying attention, others have suggested that the use of Facebook outside of the classroom encourages students to stay engaged in the class and achieve at higher levels (Garcia et al., 2015).

Microblogging and Twitter. There have been several studies on the use of microblogging, including Twitter, in the higher education classroom. Overall, these studies have found that microblogging encourages a constructivist paradigm by supporting the creation of knowledge through collaborative processes (Coxall, 2010; Ebner, Lienhardt, Rohs, & Meyer, 2010; Parry, 2008; Prestridge, 2014; Veletsianos, Kimmons, & French, 2013). These studies found that because learning is no longer limited to the information or materials provided by the instructor, students' roles shifted from passive to more active roles such as information provider, information consumer, and/or knowledge constructor (Gao, Luo, & Zhang, 2012). Microblogging "supports the learner in changing information to knowledge" because students become active learners and interact with each other and the course content (Prestridge, 2014, p.109). One study that specifically focused on Twitter found that it encouraged students to develop academic identities and relationships (McPherson, Budge, & Lemon, 2015).

YouTube. One study on the use of YouTube in the higher education classroom found that students struggled with identifying valid and academically sound content (Tan, 2013). The researcher noted that while the students were comfortable with social media and using YouTube, their confidence in using YouTube effectively as a learning tool was low (Tan, 2013). At the same time, these students still saw YouTube as a valuable resource and tool to support learning and suggested that instructors should help guide and even assess their use of social media in the classroom. Similarly, Cigognini, Pettenati, and Edirisingha (2011) found that "learners need support, guidance, and pedagogical interventions to make the best possible use of social media to support their learning goals" (as cited in Dabbagh & Kitsantas, 2012, p. 5). Furthermore, the students in Tan's (2013) study found that YouTube played an important role in creating informal online communities outside of the classroom and facilitated interactions that would not have happened otherwise.

Blogs. Studies that have examined the use of blogs in the college classroom have generally found positive effects. Harrison's (2011) study found that student participation in a blog served as a conduit through which students were able to think about class topics beyond the weekly class meetings and interact meaningfully with their peers on the topics. Furthermore, the results suggested that blogging allowed students greater control over their learning and encouraged the development of an informal learning community (Harrison, 2011). Another study found that students who participated in class blogs felt like their ideas and opinions mattered more (Churchhill, 2009).

While social networking tools, such as Facebook, Twitter, YouTube, and blogs are commonly used in higher education, the use of Google+ communities is still in its infancy (Prestridge, 2014). (Note: Google announced in October 2018 that they would be shutting down Google + in April 2019; however, findings from this study may be applied to other social media platforms. Please see Table 2 for Google + alternatives). As new technologies and social media tools emerge (and disappear), there is a need for additional research that explores the usefulness and effectiveness of these new tools in generalized settings. Furthermore, there is very little research that has attempted to measure the effects of these informal learning environments on the achievement of preservice teachers in their formal learning environments.

Current Investigation

With the previous research in mind, this mixed-methods study investigated how the utilization of an online informal learning environment, specifically Google + Communities and the creation of a PLN, influenced student success in a children's literature class. Another purpose was to determine if participation in these informal learning environments affected students' self-evaluation of their knowledge and confidence with topics related to the course content. The data was coded and analyzed in order to determine the effects of one particular informal learning environment, Google+ Communities, on the achievement and self-evaluation of students in a children's literature course. In addition, student interviews were conducted to determine perceived usefulness and benefits of Google + Communities.

This study is based on the following research questions:

1. Does participation in online informal learning environments, specifically Google + Communities, influence students' final course grades and their self-evaluation of their knowledge of topics related to the course content?
2. For what purpose do students use the online informal learning environment?
3. How do students perceive the usefulness of an online informal learning environment?
4. Beyond academics, what are the benefits of using an online informal learning environment?

Google + Communities

Google + Communities are online groups that are created based around a common topic or theme. The discussions within the community can be organized by threads created by the organizer of the community. Community members can share videos, files, images, and links and comment on others' posts. During the first class meeting, the instructor had students join the course community and explained how to use the Google + Community. While posting and commenting in the group was expected, it was not required. The instructor monitored the community but did not participate.

Theoretical Framework

Because of this study's emphasis on the constructivist nature of informal learning environments and social media, a framework based on Vygotsky's social learning theory (1978)

seemed most relevant for investigating how preservice teachers participated in and used Google + Communities to interact with the course content and their classmates. Vygotsky's theory of learning assumes that learning is a shared, interactive activity. This assumption guided the study's method and analysis of the data.

Method

Based on the nature of the research questions, this study was conducted using a mixed methods approach. As Teddlie and Tashakkori (2009) note, "[Mixed-methods] research provides better (stronger) inferences [and] provides the opportunity for a greater assortment of divergent views" (p.33). In this study, quantitative methods were used to compare the final grades and ratings on the survey for the treatment and control groups to determine the effects of the online informal environment, while qualitative methods were used to uncover themes about the purpose, usefulness and other benefits of Google + Communities.

Data Sources

Approximately 50 preservice teachers enrolled in two sections of a Children's Literature course at a university in the southwestern United States were included in the study. Half of the preservice teachers were in a treatment group that utilized a private Google + Community as a PLN, and the other half were in a control group that did not utilize a Google + Community. Otherwise, course content was identical. Data was collected through pre- and post-study surveys that were based on course objectives and self-evaluation measures. In addition, students' posts from the online Google + Community, a purposeful sample of semi-structured student interviews, and course grades were used as data sources and further analyzed. This study was approved by the researcher's Institutional Review Board, and all participants were advised of their rights and signed an informed consent form.

Student Surveys. Students in both the treatment and control groups were given a survey at the beginning of the course and after the course had ended. This survey was administered using Qualtrics software (Qualtrics, Provo, UT). The initial survey asked students to evaluate their knowledge and confidence related to the course objectives on a five point Likert scale. For the post-course survey, there were two strands of questions. One strand repeated the questions from the initial survey about student knowledge and confidence related to the course objectives.

For example, students were asked to rate their knowledge before and after the course on the following course objective: "I understand how to evaluate a children's book to determine its genre." A second strand of questions on the post-survey was adapted from a validated, student self-evaluation survey by the Center for Excellence in Teaching and Learning at the University of Wisconsin-Eau Claire (See Appendix A). The second part of the survey asked students to evaluate themselves on topics such as stimulated thinking, broadened knowledge, time spent, effort, challenge, and learning outcomes using a five-point Likert scale.

Student Interviews. For the semi-structured student interviews, the researcher used a mixed, purposeful sampling of students based on their academic performance in the course (Cresswell, 2013). Ten students, who varied in their grades and participation in the course, were selected to answer questions about their experiences with Google + Communities in order to obtain a variety of perspectives.

Data Analysis

To help answer the research questions, individual Google + posts were inductively coded in order to uncover emerging themes and patterns. Coding results were triangulated with the survey data and student interviews to strengthen reliability and trustworthiness. After coding the data, the researcher used statistical analysis (t-tests) to further analyze the significance of the data.

For the quantitative portion of this study, an independent-samples t-test was conducted to compare course grades and survey data on students' self-evaluation of their course content knowledge between the Google + Community and control groups.

A second qualitative analysis was conducted by coding student posts in the Google + Community and by coding student interviews. Initial hand coding of the Google + student posts was done using an inductive thematic approach. A complete Google + post was the unit of analysis. The researcher looked for emerging themes and patterns in the data related to course content. The initial codes were then collapsed into four major themes.

For the semi-structured student interviews, the researcher used open coding. An initial reading of the transcripts revealed several patterns of responses and codes. Using a constant comparative analysis, the transcripts were coded and analyzed until four main themes emerged.

Results

Quantitative Results

Course Grades. The course grade mean for the treatment group was slightly higher for the treatment group than the control group; however, there was no statistically significant difference.

Table 1

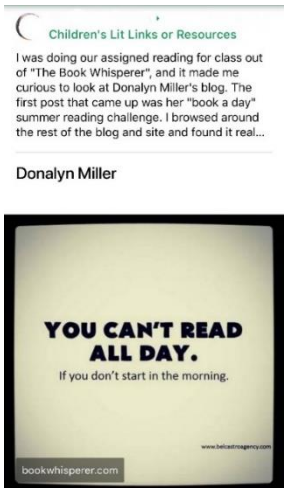
Means of Treatment and Control Group

	Treatment (Google +)		Control	
	M	SD	M	SD
Final Course Grade	94.1	29.79	93.6	36.859

Survey Data. A comparison of the students' knowledge and self-evaluation between the treatment and control groups showed no statistically significant differences; however, there was one question that showed a meaningful variance: *This course introduced me to new ideas and stimulated my thinking.* The treatment group's average was higher on this question suggesting that participating in Google + Communities may have stimulated thinking. Overall, this data suggests that participation in the informal learning environment did not have a significant influence on students' final grades and their self-evaluation of their knowledge of the course objectives. Despite the lack of statistical significance on the quantitative data, several meaningful themes emerged from the qualitative analysis of the Google + Community posts and from the student interviews.

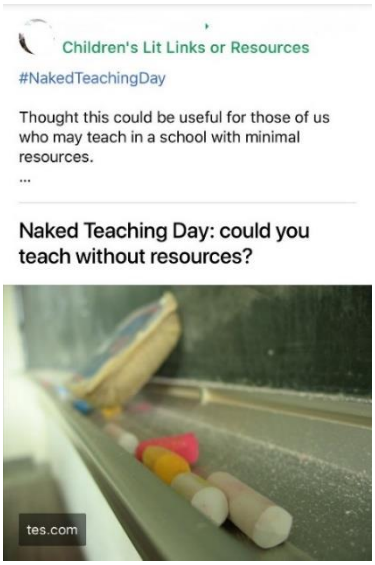
Qualitative Results

Google + Community Post Themes. Of the posts made in the Google + Community, almost half, 47%, were directly related to the course content and objectives while 41% of the posts made connections to the greater teaching profession. Interestingly, 8% of the posts made connections to other courses in the teacher education program. Finally, 3% of the posts were social posts, unrelated to the course content or other education courses. (See Figure 1).



Directly related to course content (47%)

Related to other courses in the teacher education program (8%)



Related to the greater teaching profession (41%)

Social posts (3%)

Figure 1. Examples of Google + posts from the four themes discovered in the Google + Community.

These four themes suggest that informal learning environments, such as Google + Communities, are one way to integrate the formal learning that was occurring during our face-to-face class with the informal learning and connections that were occurring outside the classroom. The various posts created a hybridized knowledge that resulted in the fusing of the formal and informal learning environments and the creation of a PLN.

Student Interview Themes. Purposeful semi-structured interviews were conducted with ten of the treatment participants. In the student interviews, four main themes emerged:

1. Resources/Ideas
2. New perspectives
3. Community building
4. Critical stance

A dominant theme from the student interviews was the idea of the posts providing resources or ideas for the students. For example, one student noted, "I like Google+ Communities because it gives our class a chance to connect and share ideas that we stumble across throughout the semester that relate to children's literature. I like exploring my classmates' posts—so many unique ideas!"

A second theme that emerged from the student interviews was the notion of new perspectives. Another student suggested, "I liked seeing how other people responded to the articles that I posted. What I saw as the most important aspect of the articles was often different from what someone else saw." Through their posts in the community, students were able to adopt new perspectives, debate points of disagreements, and present new knowledge (Marin, Negra, & Perez, 2014).

While the first two themes were consistent with previous literature on informal learning communities and social media, the last two themes provided some new insights. Community building was a theme that emerged from interviews with the students. Several students commented that the Google + Community allowed them to bond and get to know each other better. While the community building aspect of the interview was expected, one surprising result of the community building was that its effects extended to the face-to-face environment. For example, several students suggested that they spoke up in class more because the Google + Community made them feel more comfortable. One student said, "The number one reason I ended up enjoying our Google + Community was because it made me more comfortable in class

and made me speak more often because my peers had already seen what I shared, and they didn't react poorly to it."

Finally, students indicated that posting to the Google + Community encouraged them to take a more critical stance on content that was posted. A student noted, "Google + made me evaluate the material I was reading a little more. Is this one good enough to share with other people? Does it have supporting evidence?" A critical stance was an unexpected theme that emerged from the student interviews and is a finding that has not been documented in previous literature on informal learning environments.

Conclusions

Overall, the data showed the following effects from student use of Google + Communities as an online informal learning community in one teacher education course:

1. Students exhibited greater depth and understanding of the course content that was not necessarily reflected in students' final grades. This depth of understanding was reflected in the types of posts students made and in the interview themes. This effect supports the idea that higher education students gain much of their knowledge about future jobs through uncoordinated, independent learning activities (Dabbagh & Kitsantas, 2012).
2. Students reported connections and transfer of learning to other courses and the greater teaching profession. Over 8% of the students' posts were related to other courses and 41% of their posts were related to the greater teaching profession.
3. Community-building tool among students extended into the formal learning environment.
4. Students reported increased critical evaluation of information and texts.

Discussion

This study provides insight into the influence and effects of an online informal learning environment, Google + Communities, on students' learning in one teacher education course and contributes to the scant literature on how we can use social media in the higher education classroom to fuse formal and informal learning environments. Overall, the results suggest that Google + Communities supported a more participatory and interactive experience for students and encouraged connections across time and place. Of particular importance were the findings

that the Google + Community encouraged a greater sense of community online that then transferred into the formal learning environment as evidenced by students participating more in their formal learning environment. Another important finding was students' critical evaluation of the content they posted. Findings from this study contribute to the greater body of knowledge on the use of online informal learning environments and the creation of PLNs in various educational settings. This study has the potential to benefit higher education by adding additional perspectives to the issues surrounding meaningful integration of informal learning environments in the college classroom.

Alternatives to Google + Communities

Google announced in October 2018 that they would be shutting down Google + in April 2019; however, findings from this study may be generalized to other informal learning environments, outlined in Table 2 that lists Google + Community alternatives.

Table 2

Alternatives to Google + Communities

Platform	Features
Google + Communities	Same features as Google + Communities but only available within a G suite account.
MeWe	Similar to Facebook; chats; links; photos; videos; documents; comments.
Tumblr	Blog; photos; links; chats; audio; videos; Gifs; comments; reblogs.
Pinterest	Virtual pinboard; shared boards; photos; links; audio; videos; comments.
Facebook	Create a group; photos; links; chats; video; comments.

References

Cain, J., & Policastri, A. (2011). Using Facebook as an informal learning environment, *American Journal of Pharmaceutical Education, 75,* 1-8.

Churchill, D. (2009). Educational applications of Web 2.0: Using blogs to support teaching and learning. *British Journal of Educational Technology, 40*, 179-183.

Cigognini, M.E., Pettenati, M.C., & Edirisingha, P. (2011). Personal knowledge management skills in Web 2.0-based learning. In M.J.W. Lee, & C. McLoughlin (Eds.) *Web 2.0-based e-learning: Applying social informatics for tertiary teaching* (pp.109-127). Hershey, PA: IGI Global.

Creswell, J.W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd edition). Los Angeles, CA: Sage.

Croxall, B. (2010, June 7). Reflections on teaching with social media [Web log post]. Retrieved from http://chronicle.com/blogs/profhacker/reflections-on-teaching-with-social-media/24556

Dabbagh, N., & Kitsantas, A. (2012). Personal learning environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *Internet and Higher Education, 15,* 3-8.

Deng, L. & Tavares, N. (2013). From Moodle to Facebook: Exploring students' motivation and experiences in online communities. *Computers & Education*, 68,167–176.

Deng, L. & Tavares, N. (2015). Exploring university students' use of technologies beyond the formal learning context: A tale of two online platforms. *Australasian Journal of Educational Technology, 31,* 313-327.

Ebner, M., Lienhardt, C., Rohs, M., & Meyer, I. (2010). Microblogs in higher education – A chance to facilitate information and process-oriented learning? *Computers & Education, 55*, 92-100.

Ebner, M., & Maurer, H. (2009). Can weblogs and microblogs change traditional scientific writing? *Future Internet, 1,* 47-58.

Gao, F., Luo, T., & Zhang, K. (2012). Tweeting for learning: A critical analysis of research on microblogging in education published in 2008-2011. *British Journal of Educational Technology, 43,* 783-801.

Garcia, E., Elbeltagi, I.M., Dungay, K., & Hardaker, G. (2015). Student use of Facebook for informal learning and peer support. *The International Journal of Information and Learning Technology, 32,* 286-299.

Goldenberg, C. (1991). Instructional conversations and their classroom application. *Educational Practice Report 2,* National Center for Research on Cultural Diversity and Second Language Learning. Retrieved from https://escholarship.org/uc/item/6q72k3k9

Hall, R. (2009). Towards a fusion of formal and informal learning environments: The impact of the read/write web. *Electronic Journal of e-Learning, 7,* 29-40.

Harrison, D. (2011). Can blogging make a difference? *Campus Technology.* Retrieved from https://campustechnology.com/articles/2011/01/12/can-blogging-make-a-difference.aspx

Jonassen, D.H., Howland, J., Moore, J., & Marra, R.M. (2003). *Learning to solve problems with technology: A constructivist perspective* (2nd ed.). Upper Saddle River, NJ: Prentice-Hall.

Marin, V., Negre, F., & Perez, A. (2014). Construction of the foundations of the PLE and PLN for collaborative learning. *Media Education Research Journal, 42,* 35-43.

McLaughlin, M.W. & Talbert, J.E. (2006). *Building school-based teacher learning communities: Professional strategies to improve student achievement*. Chicago: University of Chicago Press

McPherson, M., Budge, K., & Lemon, N. (2015). New practices in doing academic development: Twitter as an informal learning space. *International Journal for Academic Development, 20,* 126-136.

Murphy, P. K., Wilkinson, I. A. G., Soter, A. O., Hennessey, M. N. & Alexander, J. F. (2009). Examining the effects of classroom discussion on students' high-level comprehension of text: A meta-analysis. *Journal of Educational Psychology, 101,* 740-764.

Perry, B., (2008, January 23). Twitter for academia [Web log post]. Retrieved from http://academhack.outsidethetext.com/home/2008/twitter-for-academia/

Prestridge, S. (2014). A focus on students' use of Twitter – Their interactions with each other, content and interface. *Active Learning in Higher Education, 15,* 101-115.

Smith, M.K., Wood, W.B., Adams, W.K., Wieman, C., Knight, J.K., Guild, N., & Su, T.T. (2009). Why peer discussion improves student performance on in-class concept questions. *Science, 323,* 122-124.

Tan, E. (2013). Informal learning on YouTube: Exploring digital literacy in independent online learning. *Learning, Media, and Technology, 38*, 463-477.

Teddlie, C., & Tashakkori, A. (2009). *Foundations of Mixed Methods Research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Washington DC: Sage.

Veletsianos, G., Kimmons, R., & French, K. (2013) Instructor experiences with a social networking site in a higher education setting: Expectations, frustrations, appropriations, and compartmentalization. *Education Technology Research and Development* 61, 255–278.

Vygotsky, L. (1978). *Mind in society. The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wilson, S. (2008). Patterns of personal learning environments. *Interactive Learning Environments, 16*, 17-34.

Appendix A
Pre- and Post-Course Survey

Answered on a 5-point Likert Scale, when appropriate.

Pre- and Post-Test Items

- Specific Learning Outcomes From Course Syllabus
  - I am familiar with a broad range of children's literature across all literary genres.
  - I am able to discuss issues of censorship with books.
  - I can discuss issues related to culturally sensitive literature.
  - I am familiar with criteria for selecting books related to race, ethnicity, gender, sexual orientation, family diversity, religion, and special needs.
  - I understand how to evaluate a children's book to determine its genre.
  - I can identify, select, and present children's literature for elementary-aged students for academic purposes.
  - I can identify, select, and present children's literature for elementary-aged students for enjoyment purposes.
  - I can model expressive and fluent oral reading of a book.
  - I know how to engage students in dialogue about a book.
  - I understand how to utilize technology ethically and legally.

Post-Course Items (Adapted from a Survey by the Center for Excellence in Teaching and Learning at the University of Wisconsin-Eau Claire. https://uwec.edu/.../Purposes-of-SEI-with-Exemplar-Items-3-doc.dot)

- Stimulated Thinking
  - This course introduced me to new ideas and stimulated my thinking.
  - This course helped develop my creative thinking skills.
  - I was encouraged to think critically rather than just memorize material.

- Broadened Knowledge
  - This course broadened my knowledge and understanding in the field.
  - This course expected me to consider concepts from a variety of perspectives.

- Time Spent
  - On average, the time I have spent on homework, projects, and studying outside of class every week for this course was: (a) two or more hours per class meeting, (b) between one and two hours per class meeting, (c) about one hour per class meeting, (d) less than one hour per class meeting.

- Effort
  - I did the readings and assignments on time.
  - How many classes did you miss in this course? (a) 0-1, (b) 2-4, (c) 5-7, (d) 8 or more.

- Challenging Self
  - I did my part to learn as much as possible in this course.

    - I took the initiative to read or learn about material related to the course outside of class time.

- Learning Outcomes
    - My final grade will accurately reflect my overall performance.
    - My grade is an accurate assessment of my knowledge in this course.
    - I understand the central concepts and ideas in this course.
    - I can apply information/skills learned in this course.