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Leveraging Social Networks for Authentic Learning in Distance Learning Teacher Education

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Abstract

This research examined how leveraging social networks in distance learning facilitated authentic learning in a 4-week teacher-education course. The pilot study aimed to examine the course design, and learner perceptions of social networks in distance learning. The course design was structured around nine principles of the authentic learning framework (Herrington, Reeves, & Oliver, 2010) for sustained dialogue, reflective thinking, and relevance. The intent was to facilitate authentic learning contexts, participatory activities, access to experts, collaboration, multiple perspectives, reflection, articulation, scaffolding, and authentic assessment. Synchronous and asynchronous communication was used to deliver content. Data sources included the design of learning tasks with social networks, semi-structured interviews ($N = 7$) with a convenient sample of graduate students, and a survey questionnaire to evaluate students' perception ($N = 8$) of authentic learning and social presence in the course. Data analysis involved analyzing the course design, and participants' perception of authentic learning and social presence in distance learning. Semi-structured interviews were transcribed, and analyzed for students' perception of social networks in distance learning. A participant member-checked the themes for validity. The findings indicated that the course design facilitated authentic learning with meaningful social interaction and engagement. Participant perceptions indicated that the social networks facilitated authentic communication, connections, community, student agency, self-regulation, peer and instructor feedback, and personalized learning in distance learning. Perceived challenges were related to access, navigation, sustained interest, initial reluctance, and managing the simultaneous use of various social media. Implications may inform teacher educators about leveraging social networks for authentic learning across various disciplines.

Keywords Teacher education · Distance education · Social networks · Authentic learning · Social media · Online learning

Introduction

Web 3.0 or semantic web has the potential to transform education. Web 3.0 promises to address the data explosion concerns by making the web more "machine-friendly with a semantic overlay of constructs using meta-data" (Allison and Kendrick 2015, p. 109). This meta-data is converted to meaningful information to provide intelligent solutions for locating, delivering, and evaluating online content (Morris 2011). Web

3.0 has the potential to impact distance learning positively through the personalization of learning and knowledge construction. Web-based social networks are information technologies that could potentially enrich networked user experience through data integration, personalization, and connectivity (Morris 2011).

Social networks are web-based services that allow individuals to "construct a semi-public profile within a bounded system; and, articulate a list of other users with whom they share a connection" (Boyd and Ellison 2007, p. 211). Socio-technical features of social networks permit consumption, production, and interaction with user-generated data (Ellison, and Boyd, d. 2013). Social networks connect users based on common interests through interest-specific groups, hashtags, or other site-specific features. Network users can maintain current social ties, and develop new ties with individuals from outside their social networks (Granovetter 1973; Greenhow and Askari 2017).

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Social networks are relevant for social learning as they facilitate connectivity in higher education (Veletsianos and Navarrete 2012). Leveraging web-based networks gives education stakeholders "access to a different culture that helps them clarify their beliefs about teaching with technology" (Greenhow and Askari 2017, p.625). Social networking technologies have enormous potential to enhance the teaching and learning process (Hamid et al. 2015) by fostering efficient communication, student-instructor connectivity with a "metaphorical open door," (Roblyer et al. 2010, p. 138) and "a world without borders leading to an evolution of a transformation society in which more meaningful human interactions are encouraged" (Veletsianos et al. 2013, p. 257).

Weidlich and Bastiaens (2019) posited that social networks are "paragons of social affordances and sociability" (p. 3). Therefore, they foster a collaborative, participatory culture (Jenkins et al. 2006) in an ecological social space that promotes social interaction, and user agency for personalized learning (Keijns, 2004; Withagen et al. 2012). As individuals interact in this social space, they leverage the distributed cognition of their affinity spaces (Gee 2004). Networked learning involves the construction of social ties (Granovetter 1973) where a tie represents a set of interactions among members of a network (Smith 2013) or "channels for the transfer or flow of material and non-material resources" (Schuller et al. 2003, p. 19) for professional learning. Therefore, social networks are relevant for educational use to build bridging and bonding social capital (Hargreaves and Fullan 2012) in learners, and to facilitate social, networked learning.

Twitter's Affordances for Learning Twitter has several affordances that can be used for teacher education: Hashtags (#), RT (re-tweet), reply, and live chats (Staudt-Willet 2019). The hashtags (#) or affinity spaces (Gee 2004) categorize tweets to be part of a larger conversation on a topic; hashtags (#) represent an aggregation of tagged tweets on a specific topic. As a corpus of tweets, they resemble a coherent text where a narrative can emerge (Murthy 2013). Users may reply to engage in conversation and have a threaded discussion by replying to their own tweet. The re-tweeting (RT) feature of Twitter lets users reach a wider audience to share information. The rhetorical velocity (Ridolfo and Devoss 2009) of tweets or their distribution capability, allows for remixing and fluidity of authorship with quotes, emoticons, and gifs.

Twitter offers asynchronous conversations, live chats, and private messaging capabilities. Live chats (Kerr and Schmeichel 2018) are generally one-hour synchronous chats on a specific topic where individuals share their perspectives by answering a set of questions; commenting and replying to others, sharing resources, and re-tweeting. Twitter facilitates just-in-time learning (Greenhalgh and Koehler 2017), and building of virtual professional learning networks and teacher affinity spaces (Greenhalgh et al. 2020; Krutka et al. 2017;

Smith 2013). Menkhoff et al. (2014) identified Twitter as a competency enhancing tool; it has the learning potential to enhance our awareness of others, and increase our spheres of knowledge, connecting us to a global network of individuals (Murthy 2013).

Flipgrid's Affordances for Learning Flipgrid is a web-based social media platform that is available in mobile applications as well. This video-based platform has the social networking capabilities to connect individuals within and beyond classrooms with features like grid pals, topic guests, and sharing options. Flipgrid enables individuals to record their videos, and to leave a reply to peers in a threaded discussion format. Therefore, Flipgrid provides an asynchronous multimodal discussion forum with audio and video elements. Flipgrid is organized by grids and topics; a single grid has various topics for reflection and discussion designed by the instructor. Flipgrid encourages social learning that is important for sharing perspectives and cultivating metacognition in teacher education. By hearing various perspectives on a topic, learners gain insights and connect with one another. Topic guests can be brought in as experts, and grid pals can connect geographically-dispersed classrooms to collaborate and share student voice. Flipgrid fosters a personal element in online discussions (Green and Green 2018) to create a supportive, social learning community.

Voxer and Blogger's Affordances for Learning Voxer is an instant-messaging, social networking tool with options for text, audio, and video-based instant messages. It is similar to WhatsApp instant messaging with similar capabilities. Voxer enables individuals to send instant messages without having to exchange phone numbers. There is a free version, and an administrative version with educator controls in forming groups. Blogger is a blogging platform with social networking features. Individuals can write, reflect, and use labels for categorizing their blog posts. Viewers can read blog posts, leave comments, and follow bloggers to form their social network. Affordances of both tools promote the social construction of knowledge in teacher education.

The Role of Web-Based Social Networks in Distance Learning

Distance learning continues to offer a flexible, customizable option for students (Allen and Seaman 2017; Cui et al. 2013; Dahlstrom-Hakki et al. 2020). It is more relevant than ever in the era of pandemics, wars, global warming, and extreme weather conditions. Researchers suggest that the use of social networks in formal education may be a worthwhile endeavor (Veletsianos et al. 2013). The role of social networks in creating social presence (Kreijns et al. 2020; Lowenthal and

Snelson 2017; Lowenthal, 2010; Gunawardena et al. 2009) is supported by several research studies (Weidlich and Bastiaens 2019; Baisley-Nodine et al. 2018; Richardson and Swan 2003). Apart from facilitating a participatory culture (Jenkins et al. 2006) with distributed expertise, collaboration, and connectivity, social networks introduce interaction treatments or instructional conditions in distance education that facilitate student-student, student-content, and student-instructor interactions to improve student achievement outcomes (Bernard et al. 2009). Bernard et al. (2009) posit that strengthening interaction treatments is associated with increased achievement and cognitive engagement.

Social presence in the course facilitates social interaction that has been proven to be effective in promoting critical thinking and higher-order learning (Armellini and De Stefanie 2016; Garrison and Akyol 2013). Meta-analysis research has confirmed the role of social presence in learner satisfaction (Bulu 2012; Cobb 2009, 2011; Hostetter and Busch 2013; Richardson et al. 2017). Furthermore, social presence has a positive impact on building a sense of community (Sung and Mayer 2012), student participation and motivation (Jorge 2010; Mazzolini and Maddison 2007; Swan and Shih 2005; Tao 2009; Tu and McIsaac 2002; Weaver and Albion 2005); student retention (Boston et al. 2009; Richardson et al. 2015); course and instructor satisfaction (Akyol and Garrison 2011; Cobb 2009; Gunawardena and Zittle 1997; Richarson & Swan, 2003; Swan and Shih 2005); actual and perceived learning (Hostetter and Busch 2013; Joksimovic et al. 2015; Richardson and Swan 2003), and greater engagement (Dahlstrom-Hakki et al. 2020) with implications for online course design (Arbaugh 2005; Richardson et al. 2013; Tu and McIsaac 2002).

Collaboration is the central tenet in the social presence theory. Social presence is conceptualized as "the ability of participants to identify with the group or course of study; communicate purposefully in a trusting environment; and develop personal and affective relationships progressively as a way of projecting their personalities" (Garrison 2011, p. 34).

Social presence creates an environment of engaged learning, and active collaboration in group processes. Consequently, social networks reduce the transactional distance (Moore 1993) with dialogue and autonomy to mitigate social isolation (Moore & Kearsley, 2013). In conclusion, social networks weave in human connection with immediacy and intimacy in distance learning that sets the stage for authentic, distributed collaborative learning.

Theoretical Framework: Authentic Learning Framework

Herrington and Oliver (2000) contended that decontextualized knowledge is not learning. In their framework, cognition and situation are always interdependent. Creating

authentic learning experiences (Herrington et al., 2013) in distance learning has been the focus of research in a variety of contexts (Luo et al. 2017; Marull and Kumar 2020; Teräs and Kartoglu 2018). Authentic learning has transformed the learning experiences of students in higher education with emergence of communication, visualization, and simulation technologies (Lombardi 2007). Social processes of learning have become integrally intertwined with the cognitive as learners explore, and use their judgment in making decisions (Brown, 1999 as cited in Lombardi).

Internet and communication technologies aid in forging connections from across the globe; Siemens (2005) suggested that learning is about forging connections "interpersonal connections between apprentices and mentors; intellectual connection between the familiar and the novel; personal connections between the learners' own goals, and the broader concerns of the discipline" (as cited in Lombardi, p. 2). Therefore, authentic learning in the networked, digital world occurs within a participatory culture (Jenkins et al. 2006) where there is a strong support for civic engagement and participatory practices. Sharing stories, creating persuasive media, and connecting personal passions to civic engagement are some examples of participatory practices (Gleason and Gillern 2018).

The authentic learning framework is a robust framework (Herrington et al. 2010) for designing distance learning environments based on the situated learning theory (Brown et al. 1989). Situated learning is based in real-world contexts with relevance to the learner (Chang et al. 2010). Herrington's authentic learning framework promotes learner agency and engagement in authentic web-based, mobile contexts (Hsu, 2012). Learning is most effective when the tasks and context are authentic for learners with opportunities for sustained dialogue, and the sharing of multiple perspectives (Chin et al. 2018; Anderson, 2010).

The authentic learning framework (Herrington et al. 2010) is based on nine design principles: Authentic contexts, authentic activities (Herrington et al. 2004), access to experts, multiple perspectives, collaborative construction of knowledge, reflection, articulation, coaching and scaffolding, and authentic assessment of learning (Gulikers et al. 2008). Herrington et al. (2006) noted that the task for designing for distance learning is a complex process that requires creating synergistic alignment between the task, learners, and technology. Tasks in an authentic learning environment consist of ill-defined tasks or open-ended tasks with real-life relevance, and divergent outcomes that require student autonomy in determining the sub-tasks to achieve the learning outcome (Herrington et al. 2006; Russell-Bowie 2012). The reason for having ill-defined tasks is that it lets students explore multiple possibilities for achieving the desired outcome; have them apply critical thinking; make decisions about logical sub-tasks; and provide them with a sense of agency and autonomy in their learning.

Methods

Context and Participants

This research study took place at a midwest university where full time, K-12 teachers and instructional coaches ($N = 19$) were enrolled in an online, literacy education masters' course. The research participants were selected through convenience sampling of graduate students. They were all females, Caucasians, and full-time K-12 educators in the age range of 25–52 (See the demographic Table 1). Seven ($N = 7$) participated in the focus group interviews, and eight participants ($N = 8$) participated in the survey to assess their perception of course design for authentic learning and social presence for validation purposes.

This 4-week distance learning course was delivered asynchronously on BlackBoard 8 Learning Management System (LMS), and synchronously through Zoom video-conferencing.

Twitter, Flipgrid, Blogger, and Voxer were integrated into the course. The goal for integration of these communication technologies was two-fold: First, it was to leverage the affordances of social networks to create a sociable learning environment and a social space to enhance "the ability of participants to identify with the group or course of study; communicate purposefully in a trusting environment; and develop personal and affective relationships progressively as a way of projecting their personalities" (Garrison 2011, p. 34). Strategically planned engagements on social networks were meant to foster an environment of trust, and a sense of community for individuals to develop personal and affective relationships.

Second, social network integration was to extend the professional learning beyond the walls of the LMS to create an authentic learning context with access to experts, multiple perspectives, authentic audience and feedback, and opportunities for collaboration and reflection (Herrington et al. 2010). Providing authentic contexts with social networks (Hsu and

Table 1 Demographic Characteristics of Participants

Participants ($N = 8$)	Demographics	Percentages
Age	25–29	12.5%
	30–35	75%
	51–55	12.5%
Gender	Female	100%
Ethnicity	Caucasian	100%
Profession	Pre-K Teacher	50%
	Middle School Teacher	12.5%
	High School Teacher	12.5%
	Literacy Coach	25%

Ching 2012) was to reinforce that knowledge is a dynamic tool to be applied in real-world contexts, and not an end in itself (Herrington and Oliver 2000), and it is co-constructed through social interaction for the social good.

Research Questions

The purpose of the research was to describe the course design for facilitating authentic learning, and to examine the perception of participants regarding authentic course design and social presence with social networks. The following research questions were asked:

1. How was the course designed to facilitate authentic learning, and what was the perception of students regarding the course design?

What Was the Perception of Participants Regarding Social Presence in the Course with the Use of Web-Based Social Networks in Distance Learning?

Research Design

A mixed-method research design was applied in this study with individual or focus group interviews, and a short (10 item) survey questionnaire to validate the course design of authentic learning and social presence. Focus group or individual interviews of 25–45 min duration were conducted on Zoom; they focused on student perception of the use of social networking technologies for social presence in the course. Interviews were then transcribed to code for themes. A participant member-checked (Creswell and Miller 2000) and verified the themes for validity. A short survey questionnaire was distributed with 10-questions to generate descriptive statistics on course design and social presence perception of participants ($N = 8$). The course design followed the principles of authentic learning, and there were intentional engagements scheduled with critical literacy authors. Expert review for authentic course design was not conducted in this pilot study, and therefore, it is a limitation in this research.

Data Collection and Analysis

Data sources consisted of the following: 1) Social networks embedded course assignments based on authentic learning principles 2) semi-structured interview 3) survey questionnaire. The description of the course assignments leveraging social networks and authentic learning principles is presented in the findings. The interview transcript was analyzed using content analysis (Hsieh and Shannon 2005) to interpret

meaning from the text data to capture the overarching themes. Survey on qualtrics generated quantitative data with percentages and descriptive statistics to evaluate the effectiveness of elements of course design and social presence.

Findings

Principles of authentic learning were incorporated into the course design as described below while leveraging social networking tools in distance learning. This section is arranged by the description of the course design using Herrington et al. 's (2010) nine design principles; followed by students' perception of the course design based on authentic learning and social presence as reflected in their survey responses. Students' perception of social networks in distance learning is then presented with the data from the interviews.

Course Design with Herrington's Nine Design Principles

Authentic Contexts Social networks were intended to provide authentic contexts situated in a networked, digital realm. Students researched a social justice hashtag (#) on Twitter with a focus on the origin, history, founders, and the relevance of the hashtag in the present socio-cultural, political context. Twitter provided an authentic context for hashtag activism and advocacy topics. This was followed by sharing of reflections as blog posts on Twitter.

Authentic Activities Planned activities were indicative of participatory practices to develop critical literacy (Vasquez et al. 2013) in students. They were planned to leverage social networks to cultivate student agency and autonomy towards the social good. To create awareness of social justice issues, students designed media messages with a slogan and a self-created hashtag (#). This activity required them to be introspective of their social justice stance, and intentional with design and media decisions to develop critical, digital literacy. There were some interesting self-created hashtags: #awaywiththescantron #IAEndMandatedLabelsNow #neveryounext #protectdacanow #teachheadandheart #protectalienchildrennow.

Individuals were encouraged to connect and collaborate with their book-club members through Voxer as they planned their collaborative multimodal projects on their book club topic. Voxer was meant to serve as a quick instant messaging tool with audio, video, and text messaging options. It was chosen to provide a mobile option for communication.

Access to Expert Thinking and Modeling of Processes To access experts, a synchronous one-hour Twitter chat was arranged with the author of the common text on critical literacy. The chat provided students with an opportunity to ask questions, and to share insights with an expert in the field. Also, it modeled collaborative meaning-making in a networked space.

Multiple Perspectives Students worked in collaborative groups to construct weekly Twitter-chat questions related to their text, and peers answered them throughout the week. The questions were triggering events that led students to explore, integrate, and resolve their understanding with sustained discourse. As multiple perspectives were shared, individuals leveraged distributed expertise of their professional learning networks to build collective intelligence, and engage in socially-mediated metacognition with their peers. Twitter chats generated relevant insights to inform students' professional practice.

Articulation of Tacit Knowledge Students engaged in multi-modal discussions on Flipgrid to articulate their tacit knowledge through relevant prompts. After interacting with the course materials, they shared their unique insights and perspectives on the topic, and replied to peers to extend the discussion. For example, students discussed the concept of a self-actualized teacher by unpacking their own multiple identities with *Hello, my names are* and *my names are not* (Vasquez et al. 2013, p. 31) with implications for curriculum development. In the distance learning context, it generated a conversation and the sharing of personal stories resembling an in-person conversation evoking deeply-seated emotions. These were reflective of open communication and affective expression with group cohesion.

Collaborative Construction of Knowledge Collaborative construction of knowledge occurred with sustained communication throughout the semester as students shared ideas, insights, and artifacts on social-networked spaces. Students used a variety of platforms, and multiple means of expression to showcase their learning ranging from VoiceThread presentations to Padlet projects. The collaborative projects were then shared on Twitter.

Reflection Students constructed their curriculum map at the beginning of the semester, and then at the end of the semester to demonstrate how their perspective changed after taking the course. They shared their growth in understanding with their "enhanced" curriculum maps on Twitter. On Flipgrid, students reflected (Schon 1984) on the design process of creating an advertisement with a slogan with a self-invented hashtag. Students' Flipgrid reflections were reflective of their intentional design decisions: Strategic choice of topic, visuals, colors, and the message communicated for their intended audience. Some interesting insights were generated on students' metacognitive processes underlying their creative choices. Furthermore, Blogger was used for reflecting on selected course topics.

Coaching and Scaffolding by the Teacher Design and organization of the course, discourse facilitation through

synchronous and asynchronous means, and direct instruction were facilitated to scaffold student learning. Coaching and scaffolding consisted of 1) demonstration of course concepts and social media tools; 2) problem-solving technical issues or/ and group processes; 3) clarifications, 4) providing conceptual or procedural feedback, and 5) facilitating discourse during synchronous sessions. For example, in-the-moment feedback on social media conventions (hashtags (#), numbering the answers) was provided as necessary. Assignment walkthroughs, clarifications, and demonstration formed part of direct instruction. Discourse facilitation occurred during group discussions.

Authentic Assessment of Learning within Tasks The course artifacts such as the collaborative project and the social justice advertisement created polished products in their own right with a diversity of outcomes. Hence, they provided a means for authentic assessment embedded within the tasks.

Perception of Participants on Course Design

The students were surveyed on 7 design elements of authentic learning that were explicit on a 7-point Likert scale: Relevant and meaningful activities, access to experts, multiple perspectives, reflection, articulation, collaborative construction of knowledge, scaffolding. The 7-point Likert scale ranged from strongly disagreed to strongly agreed, and yielded the following descriptive statistics. (Insert Table 2). The highest mean (M = 6.50, SD = 0.71) was for the sharing of multiple perspectives, followed by an articulation of thinking (M = 6.38, SD = 0.48) and reflection (M = 6.38, SD = 0.70). Collaborative construction of knowledge had a mean of (M = 6.25, SD = 0.43); meaningful and relevant activities had a mean of (M = 6.13. SD = 0.60) with the lowest score for scaffolding of learning (M = 5.50, SD = 1.00).

Social Presence and Community of Inquiry in Online Learning

The community of inquiry is a process model with three dynamic, interdependent components: Teaching presence, social presence, and cognitive presence (Garrison et al. 2000). The community of inquiry framework is defined as a "group of individuals who collaboratively engage in critical discourse and reflection to construct personal meaning and confirm mutual understanding" (Garrison and Akyol 2013, p. 105; Garrison 2017, p. 2). It is based on a collaborative-constructivist view of learning that assumes that higher-order learning requires building a community (Choo et al. 2020; Swan et al. 2009). Social presence is "the ability of participants to identify with the group or course of study; communicate purposefully in a trusting environment; and develop personal and affective relationships progressively as a way of projecting their personalities" (Garrison 2011, p. 34). Cognitive presence is "the extent to which participants are able to construct meaning through sustained communication" (Garrison et al. 2001, p. 81); and teaching presence is the "design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile outcomes" (Anderson et al. 2001, p. 5).

Tu (2000) asserted that social presence is required to foster online social interactions. The integration of social networks introduce the interaction treatments that are instructional or/ and media conditions in online learning to facilitate student-student, student-content, and student-instructor interactions (Bernard et al. 2009). Open communication, affective expression, and group cohesion are three dimensions of social presence (Gunawardena and Zittle 1997). Additionally, social comfort (Carlon et al. 2012), social experiences, and social space were included in the social presence survey instrument (Kreijns et al. 2014) used in this research.

This section first presents the participants' perception of social presence in the course as presented in the survey results. Then, the themes from the semi-structured focus-group interview about student perception of using social networks in online learning will be presented.

The survey responses indicated that students felt comfortable interacting with other course participants, and participating in course discussions (M = 6.25, SD = 0.66); they also felt that their point of view was acknowledged by other course participants (M = 6.25, SD = 0.43). Online discussions helped them develop a sense of collaboration, had a mean of M = 6.0,

Table 2 Student Perception of Authentic Course Design (N = 8)

Questionnaire Item	Mean (M)	Standard Deviation (SD)
The course engaged me in relevant, meaningful activities.	6.13	0.60
The course provided access to experts.	5.88	0.33
The course enabled sharing of multiple perspectives.	6.50	0.71
The course engaged me in reflection.	6.38	0.70
The course facilitated collaborative construction of knowledge.	6.25	0.43
I was able to articulate my thinking in the course.	6.38	0.48
Instructor scaffolded my learning in the course.	5.50	1.0

SD = 0.50, and getting to know other participants gave them a sense of belonging in the course, also had a mean of M = 6.0, SD = 0.71. Students felt comfortable disagreeing with other participants while still retaining a sense of trust, and had a mean of M = 6.0, SD-0.50. They felt comfortable conversing through the online medium, had a mean of M = 6.13, SD = 0.60. Web-based communication is an excellent medium for social interaction, having a mean of M = 5.63, SD = 0.99. Students were able to form distinct impressions of some course participants, had a mean of M = 5.75; SD = 0.83. (Insert Table 3 here).

Perception of Participants on the Use of Social Networks in Distance Learning

A consistent theme that emerged from the focus group conversations was social networks provided an authentic way to communicate, and various synchronous and asynchronous affordances of social networking technologies facilitated student engagement and motivation to engage with the professionals, course materials, and with one another.

Perceived Benefits

Building and Strengthening Connections in Professional Learning Social networks connected and motivated students to connect with the content, peers, instructors, and professionals: "Twitter pushed me to connect with the content and specific peers." Furthermore, social networks strengthened student-teacher connections: "I really appreciated being able to connect with you more." Students perceived social networks to be a great source of professional learning as they followed authors from their research study: "Since, you had us do a chat with an author, it encouraged me to look up authors that had been present in my research study." Students reported leveraging Twitter from a professional learning perspective as "it opened my eyes to how Twitter can be used as a different tool to learn about what is going on in the world."

Contribution of Peer Feedback towards High Engagement Social networks facilitated authentic peer and instructor feedback. It kept student engagement high in the distance learning course: "I was so excited to see I have a Flipgrid response. Just the recognition for my thoughts." They reported connecting with the like-minded individuals on Flipgrid: "Feedback was what I enjoyed getting. I was always so interested in knowing what they thought, and connecting with their ideas." Another reported: "I liked seeing other people, and what they had to say; and people to respond to on Flipgrid."

Transformation of Academic Learning to Personalized Learning Student engagement on Twitter took it from academic to personalized learning: "I would get on Twitter to post things related to what we were learning because I was passionate about it, and not just because I had to do it." They found the class hashtag to be useful for sharing, and finding resources for personalized learning: "I got connected to different Twitter handles that built on what I was learning." The mobility of Twitter personalized learning as participants mentioned "the benefit is that it is so adaptable", and "social media made learning stick throughout the week."

Authentic Communication Was Congruent with Student Needs Using social networks in distance learning was congruent with students' daily communication needs, and motivated them to participate more. About eLearning, one of them stated: "I don't think it is very authentic, and that is not how I communicate in my day-to-day life." A participant reported: "Social media served a very authentic way to communicate with one another" and "I felt empowered to engage with my classmates." They reported putting in more effort in their work, "You do more when you share with others."

Table 3 Student Perception of Social Presence in the Course

Social Presence Indicators (Kreijns et al. 2014)	Mean (M)	Standard Deviation (SD)
Getting to know other course participants gave me a sense of belonging in the course.	M = 6.00	SD = 0.71
I was able to form distinct impressions of some course participants.	M = 5.75	SD = 0.83
Web-based communication is an excellent medium of social interaction.	M = 5.63	SD = 0.99
I felt comfortable conversing through the online medium.	M = 6.13	SD = 0.60
I felt comfortable participating in the course discussions.	M = 6.25	SD = 0.66
I felt comfortable interacting with other course participants.	M = 6.25	SD = 0.66
I felt comfortable disagreeing with other course participants while still retaining a sense of trust.	M = 6.00	SD = 0.50
I felt that my point of view was acknowledged by other course participants.	M = 6.25	SD = 0.43
Online discussions helped me develop a sense of collaboration.	M = 6.0	SD = 0.50

Being Connected Encouraged Self-Directed, Self-Regulated Learning Informal learning on social networks deepened student learning as it encouraged self-directed, informal learning even after the semester was over. "I still find things that I put with the class hashtag because I think it would be so interesting for our class." Students reported being self-regulated, "on top of things," and on track. They noted, "Twitter was engaging for professional development, and for keeping up with research, but it really depends on following the right people." They appreciated that they "could replay" videos on Flipgrid, and "people had more time to be reflective of their learning" on Flipgrid.

Perceived Ease of Use and Enjoyment Built a Sense of Community Students appreciated Flipgrid for enhancing student relationships as they perceived video-based communication to be more personal: "I feel I got to know my classmates better, and a lot has to do with the projects you asked us to do." Flipgrid was considered to be "very natural and more like a conversation." Being able to hear the "tone of voice or facial expressions" made Flipgrid seem personal, and engagement more meaningful. Students perceived Flipgrid to be "private" and "user-friendly." As a participant stated: "That's why we enjoyed it because it was simple. It was incredibly easy; it helped deepen our understanding, and connected us with our classmates."

Various Modes of Communication Facilitated Options and Flexibility of Usage Students reported seeing the value of Voxer when the computer was not working with Internet issues or to send a quick message: "I liked it when we had some Internet connection problems. It was a way to send a quick message." They appreciated the voice messages sent through Voxer. "You didn't need the cell phone number of people." The appreciation of voice messages was a consistent theme that emerged with the Voxer use. "I liked Voxer too for that aspect for audio-recorded messages, and that tone of voice was better than just the text message." The text messaging capability of Voxer was seen similar to sending an email or a text message on the phone that they didn't use much.

The use of Blogger elicited different views and their perception of its value in distance learning was based on personal preference. Some participants thought it is like a diary, and not appropriate for class assignments: "Blogging to me is more like journaling. I like doing reflections on my own, not for a class." while others got encouraged by how many people had read their blog, and their enjoyment of writing and reflecting: "I enjoyed blogging so much that it is something that I might continue."

Perceived Challenges

Overwhelming and Initial Reluctance Students indicated that at first, they were reluctant to engage in open, networked learning due to the relative unfamiliarity with social networks in the context of professional learning. They indicated feeling "overwhelmed with the social media part of it." For some, it fostered resilience to overcome the initial inhibition to see growth opportunities: "This course gave me that aha moment that technology is not going anywhere. It is around to stay." They reported that despite initial reluctance, "I am glad I got exposed to them because I feel now I am more knowledgeable. I can use them in professional development with my teachers".

Access and Convenience Issue All the applications used for this course were available both on desktop as well as mobile platforms. Internet access, availability of a desktop close by, and the type of phone determined the accessibility for students. A student who traveled abroad during the duration of the course stated: "If you didn't have a smart-phone, it was difficult to use all the social media apps."

Challenges in Navigating Twitter About 30% of the participants reported challenges in navigating Twitter: "I was so worried about the logistics of Twitter that it took away some of the learning." Synchronous chat presented a challenge in "keeping up with it." A similar sentiment was echoed in: "I also felt that I was only worried about my question and her response back." Keeping sustained attention on weekly Twitter chats was challenging as well as a student noted that "to keep track of people's answers" as people answered them throughout the week, and by then their "attention had moved on to other things."

Discussion and Implications

As Web 3.0 brings more opportunities for personalized learning environments, distance learning strives to address student apathy and disconnect for adaptive, engaged social learning. Shearer et al. (2019) noted that we need to elicit faculty and student perceptions from the cognitive, social, and affective dimensions as an attempt to create a vision for the future of online learning experience. Students desire a more "personalized learning environment that is highly social" within learning communities (Shearer et al. 2019, p. 36). Research has shown that online courses that lack social presence contribute to students' sense of isolation, alienation, and high attrition rates (Carr 2000; York et al. 2007).

This research sought to address the problem of isolation, alienation, and disconnect in online learning by leveraging the affordances of social networks, and principles of authentic learning in course design 1) to provide opportunities for participatory practices, and professional networking within networked digital spaces, and 2) to create a supportive, collaborative, trusting learning community with interpersonal relationships. The research investigated the student perception

of course design for authentic learning and social presence, and student perception of leveraging social networks in distance learning.

Students perceived the course design elements facilitated the sharing of multiple perspectives with the highest mean followed by the articulation of thinking and reflection. Collaborative construction of knowledge, meaningful and relevant activities, and scaffolding of learning followed closely thereafter. Student perception of social presence in the course indicated that students perceived the course facilitated open communication in an environment of social comfort as indicated by the survey response items (Kreijns et al. 2014). The creation of a social space with affective expression and group cohesion led to the social presence in the course.

Since student-teacher, student-student, student-content interactions are vital to an effective online experience (Moore 1989), learning tasks focused on relevant student engagments in the context of their professional lives and personal passions. Intentional course design leveraging Twitter, Flipgrid, blog, and Voxer resulted in self-driven, personalized learning with student motivation to engage with the content in an environment of collaboration, community, connection, scaffolding, and peer and instructor feedback.

The learning tasks structured around authentic learning principles successfully reduced the transactional distance in distance learning with planned student-content, and student-to-student, and student-instructor interactions leveraging social networks. Transactional Distance (Moore 1993) has been re-envisioned with the connectivism theory where learning is seen as co-creation of content, metacognition, and gaining the ability to locate and apply information through networked connections (Anderson and Dron 2011; Shearer et al. 2019). Dialogue helps in overcoming the transactional distance (Chen 2001; Goel et al. 2012; Gorsky and Caspi 2005). The authentic design of the course facilitated dialogue and higher-order thinking with student agency and engagement.

The second question related to the perception of participants regarding social presence in the course, goes to the heart of effective online learning, within the context of the community of inquiry framework. Student perception of web-based social networks in online learning was based on the affordances of each platform, their perceived ease of use, perceived privacy, and the participant's comfort level with it. Consequently, the perceived ease of use and unique affordances of the social networks influenced participant perception of social presence and relevance.

Focus group participants never had the experience of using social networks for educational purposes; 28% had personal Twitter accounts that they had hardly used. Considering their limited prior experience, most participants considered their use to be empowering and authentic for continuing the discourse with multiple perspectives; for connecting with peers and experts; and for creating a supportive, collaborative community of practice with mutual engagement, joint enterprise, and shared repertoires (Gee 2004; Guldberg and Pilkington 2006). The participants unanimously agreed that Flipgrid, a video-based asynchronous discussion platform, strengthened a sense of community by creating the social presence through multimodal affordances. Flipgrid's ease of use, perceived privacy, and video-based asynchronous interaction made it very appealing for the participants. Being able to hear the tone of voice and facial expressions made Flipgrid more personal and authentic in distance learning. Furthermore, asynchronous video recording provided students time to think through their answers. Hence, Flipgrid promoted deeper, more introspective student responses. Additionally, the participants enjoyed getting peer feedback on Flipgrid with comments, suggestions, and validation of their thoughts.

They perceived text-based communication to be open to interpretation whereas in video-based communication, the tone of voice and facial expressions clarified the message being delivered. Flipgrid had the intimacy factor built into it with eye contact, smile, and self-revealing conversational topics as well as immediacy indicative of psychological distance with facial expression and formality of dress. Flipgrid helped individuals in assessing the tone of voice and facial expressions to determine meaning, and to develop intimacy in interpersonal interactions. The mediated communication in Flipgrid with audio-visual elements helped students perceive others as "real people" (Gunawardena and Zittle 1997, p. 151). Voxer with its audio messages was preferred over text-based messages for communication purposes for the same reason.

Twitter, on the other hand, did not afford reading of tone unless someone posted a video. Due to the fast-paced interactions and distribution capability, Twitter was more suited for connecting with professionals, concise postings, and resources. Despite coaching and scaffolding, the participants had to acquire hands-on experience by engaging with the platform. Individual self-efficacy and preferences for the platform varied impacting the personal benefits for each individual. Therefore, there were differences in perception with the ease of navigating the platform; sorting through the information, or revisiting the course hashtag to see additional peer postings. Twitter evoked mixed reactions based on participant self-efficacy and disposition toward going out of their comfort zone. Participants appreciated expert connections, educational resources, social interaction and conciseness of Twitter. However, some participants found Twitter weekly chat difficult to navigate in terms of keeping track of people's answers as they were posted throughout the week. A few participants noted that their focus shifted to other matters after posting their initial replies.This could be attributed to their workload as a student as well as their disposition for sustained engagement on Twitter as a tool of professional learning. Despite the course hashtag, navigation difficulties seemed to originate due to self-efficacy on the platform.

Blogger was mainly used as a means to reflect on the content. Had it been used to connect with other educational bloggers and peers, it could have been seen as a means to build connections. Further, limiting the number of platforms, and individualized practice sessions in a longer course might have scaffolded student efficacy with social networks.

The implication of this study is to leverage social networks to facilitate authentic learning while being cognizant of the cognitive load, course duration, and the self-efficacy of students. Nevertheless, positive gains in learning with social networks surpass any perceived challenges. Leveraging social networks for authentic learning has the potential of transforming teacher education for an active, engaged, and personalized online learning experience for students. Social networks in online learning facilitate authentic learning with the "continuation of how students talk to each other in other contexts, such as the chatter of the back rows of the lecture theater, coffee shop, or after college telephone conversations" (Selwyn 2009, p. 170). Authentic course design with social networks mitigates learner isolation, apathy, and disconnect for social learning in distance learning.

Conclusion

Intentional course design with the nine design principles for authentic learning (Herrington et al. 2010) was successful in promoting student agency, collaboration, and a sense of community with the sharing of multiple perspectives, reflection, and articulation of tacit knowledge. As students navigated multiple perspectives; disrupted common-place thinking; unpacked their identities; and current socio-cultural-political issues, they engaged in participatory practices for social justice within an authentic learning context.

The authentic learning design with social networks created social presence within the community of inquiry framework for online learning. Building interpersonal relationships within a collaborative, trusting community not only prevented student isolation and apathy, but also resulted in active engagement in the course content for networked learning. Authentic design principles informed the course design for meaningful learning. Therefore, leveraging social networks for authentic learning provides a connected, personalized online learning experience in distance learning.

References

Akyol, Z., & Garrison, D. R. (2011). Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning. *British Journal of Educational Technology, 42*(2), 233–250.

Allen, I. E., & Seaman, J. (2017). *Digital compass learning: Distance education enrollment report*. Babson Park, MA: Babson Survey Research Group.

Allison, M., & Kendrick, L. M. (2015). Toward education 3.0: Pedagogical affordances and implications of social software and the semantic web. *New Directions in Teaching and Learning, 144*, 109–119.

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning, 12*(3), 80–97.

Anderson, T., Rourke, L., Garrison, D. R., & Archer, W. (2001). Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning Networks, 5*(2), 1–17.

Arbaugh, J. B. (2005). Is there an optimal design for on-line MBA courses. *The Academy of Management Learning and Education, 4*, 135–149.

Armellini, A., & De Stefanie, M. (2016). Social presence in the 21st century: An adjustment to the community of inquiry framework. *British Journal of Educational Technology, 46*(7), 1202–1216.

Baisley-Nodine, E., Ritzhaupt, A. D., & Antonenko, P. D. (2018). Exploring social presence within an online course using twitter. *E-Learning and Digital Media, 15*(5), 235–253.

Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C. A., Tamim, R. M., Surkes, M. A., & Bethel, E. C. (2009). A meta-analysis of three types of interaction treatments in distance education. *Review of Educational Research, 79*(3), 1243–1289.

Boston, W., Diaz, S., Gibson, A., Ice, P., Richardson, J., & Swan, K. (2009). An exploration of the relationship between indicators of the Community of Inquiry framework and retention in online programs. *Journal of Asynchronous Learning Networks, 13*(3), 67–83.

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13*(1), 210–230.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32–42.

Bulu, S. T. (2012). Place presence, social presence, co-presence, and satisfaction in virtual worlds. *Computers & Education, 58*(1), 154–161.

Carlon, S., Bennett-Woods, D., Berg, B., et al. (2012). The Community of Inquiry Instrument: Validation and results in online health care disciplines. *Computers & Education, 59*(2), 215–221.

Carr, S. (2000). As distance education comes of age, the challenge is keeping the students. *The Chronicle of Higher Education, 46*(23), 39–41.

Chang, C. W., Lee, J. H., Wang, C. Y., & Chen, G. D. (2010). Improving the authentic learning experience by integrating robots into the mixed-reality environment. *Computers in Education, 55*(4), 1572–1578.

Chen, Y. (2001). Transactional distance in world wide web learning environments. *Innovations in Education and Teaching International, 38*(4), 327–338.

Chin, K. Y., Lee, K. F., & Chen, Y. L. (2018). Using an interactive ubiquitous learning system to enhance authentic learning experiences in a cultural heritage course. *Interactive Learning Environments, 26*(4), 444–459.

Choo, J., Bakir, N., Scagnoli, N. I., et al. (2020). Using the Community of Inquiry framework to understand students' learning experience in online undergraduate business courses. *TechTrends, 64*, 172–181 https://doi-org.proxy.lib.uni.edu/10.1007/s11528-019-00444-9.

Cobb, S. C. (2009). Social presence and online learning: A current view from a research perspective. *Journal of Interactive Online Learning, 8*, 241–254.

Cobb, S. C. (2011). Social presence, satisfaction, and perceived learning of RN-to-BSN students in web-based nursing courses. *Nursing Education Perspectives, 32*(2), 115–119.

Creswell, J., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory Into Practice, 39*(3), 124–130.

Cui, G., Lockee, B., & Meng, C. (2013). Building modern online social presence: A review of social presence theory and its instructional design implications for future trends. *Education and Information Technologies, 18*, 661–685.

Dahlstrom-Hakki, I., Alstad, Z., & Banerjee, M. (2020). Comparing synchronous and asynchronous online discussions for students with disabilities: The impact of social presence. *Computers & Education, 150*, 1–11.

Ellison, N. B., & Boyd, d. (2013). Sociality through SNS. In W. H. Dutton (Ed.), *The Oxford handbook of internet studies* (pp. 151–172). Oxford, UK: Oxford University Press.

Garrison, D. R. (2011). Article review: Social presence within the community of inquiry framework. *International Review of Research in Open and Distance Learning, 13*(1), 250–252.

Garrison, D. (2017). *E-learning in the 21st century: A framework for research and practice* (3rd ed.). New York, NY: Routledge.

Garrison, D., & Akyol, Z. (2013). The Community of Inquiry theoretical framework. In M. Moore (Ed.), *Introducing the 2013 handbook of distance education* (3rd ed., pp. 104–120). Abingdon: Routledge.

Garrison, D., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(3), 87–105.

Garrison, D. R., Anderson, T. & Archer, W. (2001) Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education, 15*(1), 7–23.

Gee, J. P. (2004). *Situated language and learning: A critique of traditional schooling*. London, UK: Routledge.

Gleason, B., & Gillern, S. V. (2018). Digital citizenship with social media: Participatory practices of teaching and learning in secondary education. *Educational Technology & Society, 21*(1), 200–212.

Goel, L., Zhang, P., & Templeton, M. (2012). Transactional distance revisited: Bridging face and empirical validity. *Computers in Human Behavior, 28*, 1122–1129.

Gorsky, P., & Caspi, A. (2005). A critical analysis of transactional distance theory. *The Quarterly Review of Distance Education, 6*(1), 1–11.

Granovetter, M. S. (1973). The strength of weak ties. *The American Journal of Sociology, 78*, 1360–1380.

Green, T., & Green, J. (2018). Flipgrid: Adding voice and video to online discussions. *TechTrends, 62*, 128–130.

Greenhalgh, S., & Koehler, M. (2017). 28 days later: Twitter hashtags as just-in-time professional development. *TechTrends, 61*(3), 273–281.

Greenhalgh, S. P., Rosenberg, J. M., Willet, B. S., Koehler, M. J., & Akglau, M. (2020). Identifying multiple learning spaces within a single teacher-focused twitter hashtag. *Computers & Education, 148*, 1–12.

Greenhow, C., & Askari, E. (2017). Learning and teaching with social network sites: A decade of research in K-12 related education. *Education and Information Technologies, 22*, 623–645.

Guldberg, K., & Pilkington, R. (2006). A community of practice approach to the development of non-traditional learners through networked learning. *Journal of Computer Assisted Learning, 22*(3), 159–171.

Gulikers, J. T., Bastiaens, T. J., Kirschner, P. A., & Kester, L. (2008). Authenticity is in the eye of the beholder: Student and teacher perceptions of assessment authenticity. *Journal of Vocational Education & Training, 60*(4), 401–412.

Gunawardena, C., & Zittle, F. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *The American Journal of Distance Education, 11*, 8–26.

Gunawardena, C. N., Hermans, M. B., Sanchez, D., Richmond, C., Bohley, M., & Tuttle, R. (2009). A theoretical framework for building online communities of practice with social networking tools. *Educational Media International, 46*(1), 3–16.

Hamid, S., Waycott, J., Kurnia, S., & Chang, S. (2015). Understanding students' perceptions of benefits of online social networking use for teaching and learning. *The Internet & Higher Education, 26*, 1–9.

Hargreaves, A., & Fullan, M. (2012). *Professional capital: Transforming teaching in every school*. New York, NY: Teachers College Press.

Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development, 48*, 23–48.

Herrington, J., Reeves, T., Oliver, R., & Woo, Y. (2004). Designing authentic activities in web-based courses. *Journal of Computing in Higher Education, 16*(1), 3–29.

Herrington, J., Reeves, T. C., & Oliver, R. (2006). Authentic tasks online: A synergy between learner, task, and technology. *Distance Education, 27*(2), 233–247.

Herrington, J., Reeves, T. C., & Oliver, R. (2010). *A guide to authentic e-learning*. London, Uk: Routledge.

Hostetter, C., & Busch, M. (2013). Community matters: Social presence and learning outcomes. *Journal of the Scholarship of Teaching and Learning, 13*(1), 77–86.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277–1288.

Hsu, Y.-C., & Ching, Y.-H. (2012). Mobile microblogging: Using twitter and Mobile devices in an online course to promote learning in authentic contexts. *International Review of Research in Open and Distance Learning, 13*(4), 211–227.

Jenkins, H., Purushotama, R., Clinton, K., Weigel, M., & Robinson, A. (2006). *Confronting the challenge of participatory culture: Media education for the 21st century*. Boston, MA: MacArthur Foundation.

Joksimovic, S., Gasevic, D., Kovanovic, V., Riecke, B. E., & Hatala, M. (2015). Social presence in online discussions as a process predictor of academic performance. *Journal of Computer Assisted Learning, 31*(6), 638–654.

I. Jorge (2010). Social presence and cognitive presence in an online training proram for teachers of Portuguese: Relation and methodological issues. *In Proceedings from IODL and ICEM 2010 joint conference and media days,* (pp. 427-435).

Kerr, S. L., & Schmeichel, M. J. (2018). Teacher twitter chats: Gender differences in Participants' contributions. *Journal of Research on Technology in Education, 50*(3), 241–252.

Kreijns, K., Van Acker, F., Vermeulen, M., & Van Buuren, H. (2014). Community of Inquiry: Social presence revisited. *E-Learning and Digital Media, 11*(1), 5–18.

Kreijns, K., Bijker, M., & Weidlich, J. (2020). A Rasch analysis approach to the development and validation of a social presence measure. In M. Khine (Ed.), *Rasch measurement*. Singapore: Springer.

Krutka, D. G., Carpenter, J. P., & Trust, T. (2017). Enriching professional learning networks: A framework for identification, reflection, and intention. *TechTrends, 61*, 246–252 https://doi.org/10.1007/s11528-016-0141-5.

Lombardi, M. M. (2007). *Approaches that work: How authentic learning is transforming higher education. ELI report no. 5*. Boulder, CO: EDUCAUSE Learning Initiative.

Lowenthal, P. R., & Snelson, C. (2017). In search of a better understanding of social presence: An investigation into how researchers define social presence. *Distance Education, 38*(2), 141–159.

Luo, T., Murray, A., & Crompton, H. (2017). Designing authentic learning activities to train pre-service teachers about teaching online. *International Review of Research in Open and Distance Learning, 18*(7), 141–157.

C. Marull, S. Kumar (2020). Authentic language learning through Telecollaboration in online courses. TechTrends. https://doi.org/10.1007/s11528-020-00488-2.

Mazzolini, M., & Maddison, S. (2007). When to jump in: The role of the instructor in online discussion forums. *Computers & Education, 49,* 193–213.

T. Menkhoff, Y. W. Chay, M. L. Bengtsson, C. J. Woodard, & B. Gan (2014). Incorporating microblogging ('tweeting') in higher education: Lessons learnt in a knowledge management course. *Computers in Human Behavior,* 1-6.

Moore, M. (1989). Three types of interaction. *American Journal of Distance Education, 3,* 1–7.

Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22–38). New York, NY: Routledge.

Morris, R. D. (2011). Web 3.0: Implications for online learning. *TechTrends, 5*(1), 42–46.

Murthy, D. (2013). *Twitter: Social communication in the twitter age.* Malden, MA: Polity Press.

Richardson, J. C., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks, 7*(1), 68–88.

Richardson, J. C., Schnieders, R., vanBarneveld, A., Pistilli, M., & Moke, C. (2013). *Improving student outcomes by using the Community of Inquiry framework to guide course redesign. In paper presented at Sloan-C annual international conference.* FL: Orlando.

Richardson, J. C., Koehler, A., Besser, E., Caskurlu, S., Lim, J., & Mueller, C. (2015). Conceptualizing and investigating instructor presence in online learning environments. *The International Review of Research in Open and Distance Learning, 16*(3), 256–297.

Richardson, J. C., Maeda, Y., Lv, J., & Caskurlu, S. (2017). Social presence in relation to students' satisfaction and learning in an online environment: A meta-analysis. *Computers in Human Behavior, 71,* 402–417.

Ridolfo, J., & Devoss, N. (2009). Composing for recomposition: Rhetorical velocity and delivery. *Kairos: A Journal of Rhetoric, Technology, and Pedagogy, 13*(2).

Roblyer, M., McDaniel, M., Webb, M., Herman, J., & Witty, J. (2010). Findings on facebook in higher education: A comparison of college faculty and student uses and perceptions of social networking sites. *The Internet and Higher Education, 13*(3), 134–140.

Russell-Bowie, D. E. (2012). Developing preservice primary teachers' confidence and competence in arts education using principles of authentic learning. *Australian Journal of Teacher Education, 37*(1), 60–74.

Schuller, T., Baron, S., & Field, J. (2003). Social capital: A review and critique. In S. Baron, J. Field, & T. Schuller (Eds.), *Social capital: Critical perspectives* (pp. 1–38). New York, NY: Oxford University Press.

Selwyn, N. (2009). Faceworking: Exploring students' education-related use of facebook. *Learning, Media and Technology, 34*(2), 157–174.

Shearer, R. L., Tugce, A., Hitchcock, J., Resig, J., Driver, J., & Kohler, M. (2019). What students want: A vision of a future online learning experience grounded in distance education theory. *American Journal of Distance Education, 34*(1), 1–17.

Schon, D. (1984). *The reflective practitioner: How professionals think in action.* London, UK: Routledge.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning, 2*(1).

Smith, R. (2013). Virtual induction: A novice teacher's use of twitter to form an informal mentoring network. *Teaching and Teacher Education, 35,* 25–33.

Staudt-Willet, B. (2019). Revisiting how and why educators use twitter: Tweet types and purposes in #Edchat. *Journal of Research on Technology in Education, 51*(3), 273–289.

Sung, E., & Mayer, R. E. (2012). Five facets of social presence in online distance education. *Computers in Human Behavior, 28*(5), 1738–1747.

Swan, K., & Shih, L. F. (2005). On the nature and development of social presence in online course discussions. *Journal of Asynchronous Learning Networks, 9*(3), 115–136.

Swan, K., Garrison, D. R., & Richardson, J. C. (2009). A constructivist approach to online learning: The Community of Inquiry framework. In C. R. Payne (Ed.), *Information technology and constructivism in higher education: Progressive learning frameworks* (pp. 43–57). Hershey: IGI Global.

Y. Tao (2009). The relationship between motivation and online social presence in an online class (doctoral dissertation). Retrieved from ProQuest dissertations and theses. (order no. 3357909).

Teräs, H., & Kartoglu, Ü. (2018). Authentic learning with Technology for Professional Development in vaccine management. *Australasian Journal of Educational Technology, 34*(3), 15–29.

Tu, C. H. (2000). Online learning migration: From social learning theory to social presence theory in a CMC environment. *Journal of Network and Computer Applications, 23*(1), 27–37.

Tu, C. H., & McIsaac, M. (2002). The relationship of social presence and interaction in online classes. *The American Journal of Distance Education, 16,* 131–150.

Vasquez, M. V., Tate, S. L., & Harste, J. C. (2013). *Negotiating critical literacies with teachers: Theoretical foundations and pedagogical resources for pre-service and in-service contexts.* New York, NY: Routledge.

Veletsianos, G., & Navarrete, C. (2012). Online social networks as formal learning environments: Learner experiences and activities. *The International Review of Research in Open and Distance Learning, 13*(1), 144–166.

Veletsianos, G., Kimmons, R., & French, K. D. (2013). Instructor experiences with a social networking site in a higher education setting: Expectations, frustrations, appropriation, and compartmentalization. *Educational Technology Research and Development, 61*(2), 255–278.

Weaver, C. M., & Albion, P. (2005). *Momentum in online discussions: The effect of social presence on motivation for participation.* In Proceedings ASCILITE 2005: 22nd annual conference of the australasian society for computers in learning in tertiary Education: Balance, fidelity, mobility-maintaining the momentum? (pp. 703–706). Queensland University of Technology, Teaching and Learning Support Services.

Weidlich, J., & Bastiaens, T. J. (2019). Designing sociable online learning environments and enhancing social presence. *An affordance enrichment approach, Computers & Education, 142,* 1–17.

Withagen, R., De Poel, H. J., Araújo, D., & Pepping, G. J. (2012). Affordances can invite behavior: Reconsidering the relationship between affordances and agency. *New Ideas in Psychology, 30*(2), 250–258.

York, C. S., Yang, D. Y., & Dark, M. (2007). Transitioning from face-to-face to online instruction: How to increase presence and cognitive/social interaction in an online information security risk assessment class. *International Journal of Information and Communication Technology Education, 3*(2), 41–50.