

***Social Presence and Engagement:  
A Design-Based Research Study to Incorporate Web 2.0 Protocols***

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**Abstract**

Increased social presence in asynchronous courses has shown to lead to student success and improved learning experiences. However, many students still lack social presence in asynchronous courses. This study utilizes educational design research (EDR) methods to frame an investigation into the issues and potential solutions for the lack of social presence in asynchronous online courses. EDR methodological framework is used to suggest a process for change via a social negotiating process drawing upon theoretical resources and practitioner participation. This study aims to explore how social presence can be established through an initial personal learning network activity to build trust and interaction among peers to address student and teacher connections, engagement, and the development of social presence. It describes the initial stage of EDR with an analysis and exploration of literature potential use of computer-supported collaborative concept map Web 2.0 found in a literature review. The Community of Inquiry framework is used as a theoretical basis to understand social presence, which consists of emotional expression, open communication, and group cohesion. Group cohesion, where trust and interaction occur by setting up the learning environment with opportunities for interaction and collaboration, is considered to potentially enhance student satisfaction and learning outcomes. The results of this study contribute to the understanding of how social presence can be established in online learning environments and inform the design of online courses to enhance student engagement and satisfaction.

Keywords: Education Design-Based Research, EL, PLN, Social Presence, Icebreaker

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## Introduction

Online e-learning is increasing in higher education as it provides an alternative to traditional in-person instruction by using technology to deliver learning resources (Abou El-Seoud, et al., 2014). In online courses, participant interaction and activity are important in online learning effectiveness (Richardson, et al. 2012). However, online course effectiveness has been in question (Sung & Mayer, 2012) and its quality considered disadvantaged (Johnson & Aragon, 2003). A major challenge of online learning, in particular asynchronous learning environments, is the difference in learning experience compared to in-person learning, such as lack of synchronicity, non-verbal cues (Akcaoglu & Lee, 2016), and interactional difficulties (Alqahtan & Rajkhan, 2020).

A sense of connection to others online is an important factor for a learner's learning experience and performance (Yoon & Leem, 2021). Research has shown that social presence is positively linked with learning outcomes and student satisfaction (Akcaoglu & Lee, 2016). Learners' perception of interaction and social connection with the teacher and other students in a learning environment can be described as social presence (Richardson, et al. 2017). Social presence is defined as “the ability of people to present themselves as ‘real people’... online” (Lowenthal & Lowenthal, 2010, p. 1). Social presence promotes comfort and emotional connections (Aragon, 2003). While traditionally, trust is assumed to build gradually within teams over time after evaluating others behavior (Robert et al., 2009), however, initial course introduction activities (e.g., ice breakers) can encourage the development of swift trust (Peacock et al., 2016). Moreover, dedicated discussion for course introductions can help build a sense of community (Rovai, 2002).

This study investigates how instructors might establish connections and relationships with students via initial activities (icebreakers/ introductions), to help develop social presence, trust and interactions among peers, before beginning academic course content. It looks into the social negotiating process.

## Research Questions

1. What is the impact of social presence as a factor on the student experience in an online learning course?
2. How can social presence inform the application of Web 2.0 tools in building student trust, communication, and group cohesion?
3. What instructional design elements can be incorporated into designing an initial social activity?

## Literature Review

The Community of Inquiry (CoI) theoretical framework is a popular social constructivist approach for building communities (Flock, 2020). Garrison et al. (2000) determined three categories of social presence. These categories are: (1) emotional expression, where learners share personal opinions and values; (2) open communication, where learners develop mutual acknowledgement, awareness, and recognition; and (3) group cohesion, where learners build and sustain trust and connection between members. Group cohesion in an online setting may take time, shared social context, personal purposeful interaction, and open communication (Tseng & Yeh, 2013). Moreover, sociability, the degree of association in an online environment, can be designed into a course to promote needed social connections and

interactions to form interpersonal relation affordances (Akcaoglu & Lee, 2016). This study focuses on the overlap of social and teacher presence, where setting the climate of a course occurs.

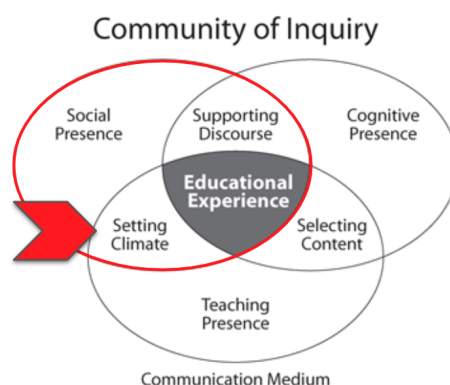


Figure 1: Community of Inquiry (Adapted from Garrison, Anderson, and Archer, 2000).

Teaching presence is believed to be a necessary prerequisite for the development of social and cognitive presence (Shea & Bidjerano, 2008). Anderson et al. (2001) conceptualized teaching presence as having three components: (1) instructional design and organization; (2) facilitating discourse; and (3) direct instruction. Firstly, instructional design principles, such as those by Garrison in 2009, can guide course design development, they include: 1) design for open communication and trust; 2) design for critical reflection and discourse; 3) create and sustain a sense of community; 4) support purposeful inquiry, 5) ensure that students sustain collaboration; 6) ensure that inquiry moves to resolution; and 7) ensure assessment is congruent with intended learning outcomes. Instructors can provide opportunities for student and teacher profiles within the learning management system (Lowenthal & Parscal, 2008). Secondly, for discourse, instructors can design interpersonal interaction within an online course by implementing a collaborative learning instructional strategy (Brindley et. al, 2009), where students participate in group work with members who have the same goals, which can affect student attitudes and performance (Richardson et. al, 2012). Moreover, interactive activities that encourage social presence can enhance learner's satisfaction with online education (Arbaugh & Benbunan-Fich, 2006). Lastly, for direct instruction, instructors may use backward design for mapping of curriculum and instructional practices that are aligned to observable and measurable goals (Wiggins & McTighe, 2005).

## Methods

This study uses educational design research (EDR) to frame the scope of the research. EDR can be defined “as a genre of research in which the iterative development of solutions to practical and complex educational problems also provides the context for empirical investigation, which yields theoretical understanding that can inform the work of others” (McKenney & Reeves, 2018, p 6). EDR is based on a family of similar approaches: DBR, action research, participatory design research, etc. Its aim is to create practical interventions by designing solutions that will be utilized in the real world; yet go through an iterative cycle process of inquiry that is theory oriented. It is collaborative and responsively grounded by involving practitioners in context (Plomp, 2013). The current project being presented is the initial and first stages of the EDR project, which starts with analysis and exploration of the topic (See Figure 2). The analysis identifies and orients educational problems in context, which in this case is online asynchronous courses in higher education. The problem was

based on researcher experience as students and teachers and a literature review, which confirmed that online classes lack interaction with peers and instructors.

The following sections of this paper move on to describe the initial stage of this EDR project with an analysis and exploration of Web 2.0 tools found in the literature. The paper then discusses the development of one particular approach and provides an example to address student and teacher connections, engagement, and the development of social presence before moving on to the conclusion.

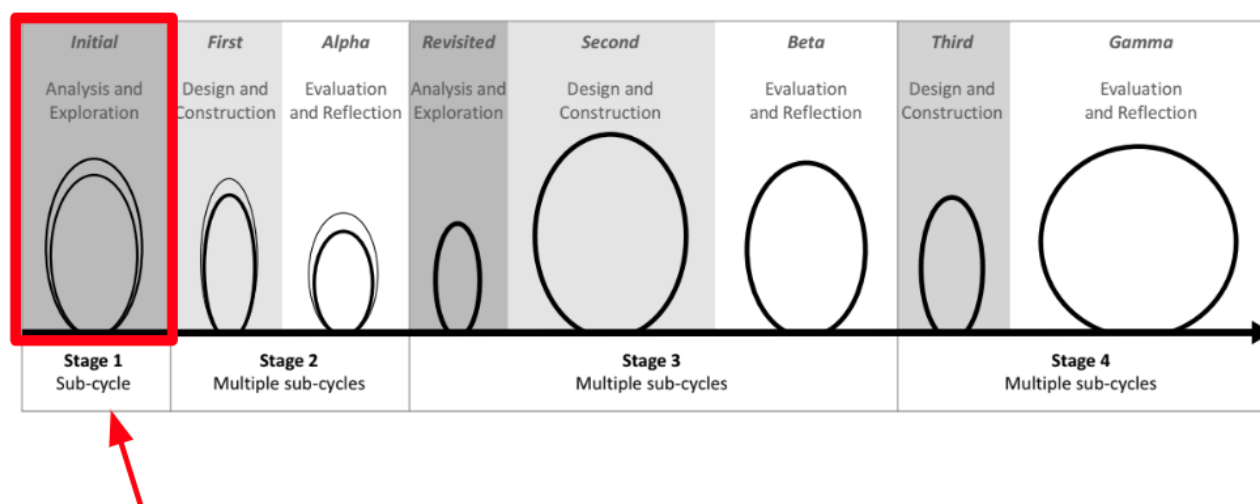


Figure 2. EDR Project Process Sub-cycles  
(Adapted from McKenney & Reeves, 2018, p. 241).

## E-learning

Technological means have made it possible to generate new learning environments and methodologies that have emerged and evolved into various resources that serve to enhance and improve teaching and learning processes. These technologies are referred to as information and communication technologies (ICTs), defined as “the varied collection of technological gear and resources which are made use of to communicate... generate, distribute, collect and administer information” (Sarkar, 2012). ICT used in education is a method or approach called E-learning, which is “the use of electronic media, educational technology and information and communication technologies (ICT) in education” (Pavel, et al., 2015). ICTs can enhance learning to be more efficient, interactive, and productive (Akram et al., 2022). ICTs can influence learning by allowing a more proactive environment where teachers can integrate technology into their pedagogical approaches for more interactive and productive practices (Sekhri, 2021). ICT Web 2.0 media may be leveraged as an affordance to share ideas digitally (Robinson, Kilgore, & Bozkurt, 2020). Bloom’s digital taxonomy (Churches, 2008) may be used to guide web 2.0 integration alignment and the Pedagogy Wheel (Carrington, 2016) can help guide teachers in the selection and use of ICT. However, ICT are often underutilized by instructors due to limits in digital literacy skills and time to choose tools and for creating authentic and engaging learning interventions (Conole & Wills, 2013; Washington, 2019).

## Concept Maps

According to active theory, “the selection and design of adequate communication tools is an important factor for collaboration support systems” (Komis et al, 2002; p. 182). One frequently used instructional and collaborative learning approach for social constructive student learning is the concept map technique (Komis et al, 2007). A concept map is a tool for sense-making through meaningful learning “by constructing conceptual nodes and interconnecting them with well described links results in producing concept maps that possibly reflect internal semantic networks” (Komis et al, 2007, p. 993). It is a probing strategy to organize and represent new and old knowledge into a graphic representation for meaning making (Greene & Azevedo, 2010). These mental models can be used to share reasoning, problem solving, and mediating student collaborative activity. Additionally, a computer-supported collaborative concept map (CSCCM), uses ICT to create concept maps, which can support conceptual understanding, collaboration, cognitive group awareness, performance, and digital construction (Farrokhnia et al., 2019). Moreover, CSCCM allows for quicker and easier concept map revision and sharing (Liu et al., 2021).

## PLN

As the internet provides a means for connectivism (Siemens, 2005) where students can learn informally, they are also able to leverage participant selected and moderated online spaces in Web 2.0 technologies to facilitate knowledge network connections. One online collaborative task that students might engage in is to make and share a CSCCM of their personal/professional learning network (PLN). PLNs “consist of formal and informal networks of individuals with similar goals and interests who interact using digital tools to share information, learn from each other, problem solve and collaborate” (Green, 2020). PLN provides ongoing opportunities for interaction, connection, self-directed learning, and engagement (Krutka et al., 2017). A digital PLN encourages participants to use web 2.0 social media (See Figure 3), for self-organized learning by accessing resource information, dialogue and constructing and resources created by other members. PLN spaces have been implemented for teachers, pre-service teachers, and older adults (Krutka et al., 2017; Poortman, et al., 2022; Luo et al., 2017; Morrison & McCutcheon, 2019). This paper suggests more research on students creating and sharing their PLN virtually, particularly for non-educator specific networks as an icebreaker activity.

What a PLN Might Look Like		
Informal Learning	Formal Learning	Social Networking
<ul style="list-style-type: none"> <li>• Blogs</li> <li>• Pinterest</li> <li>• Youtube</li> <li>• RSS Feeds</li> </ul>	<ul style="list-style-type: none"> <li>• Udemy</li> <li>• Podcasts</li> <li>• Online Book clubs/groups</li> <li>• Khan Academy</li> </ul>	<ul style="list-style-type: none"> <li>• Facebook</li> <li>• Twitter</li> <li>• Instagram</li> <li>• snapchat</li> </ul>

Figure 3. Categories of learning for a personal learning network (Green, 2017).



Figure 4. Personal Learning Network Example.

## Discussion

The study of social presence and engagement in online learning environments is crucial to the development of effective and meaningful learning experiences. The use of design-based research, drawing on the Community of Inquiry framework, and incorporating Web 2.0 protocols provides a process for instructors to design social activities, such as icebreakers, that foster trust and interaction among peers and with the instructor. This can be achieved through the implementation of instructional design principles, fostering critical reflection and discourse, and supporting purposeful inquiry.

Technology has afforded new ways to participate in new learning communities. While PLNs are currently used for teacher professional development (Krutka et al., 2017), they could be used more by students to improve theirs. PLNs offer access to a variety of information and resources that may be curated or evaluated by other professionals allowing quickly handling of expanding and growing data information through communication, collaboration, and support among participants. PLN may establish an appropriate social climate for in-group and cross-group communication that contributes to cultivating social presence and learning experiences (Stephens & Roberts, 2017; Szeto, 2015). PLN might help students find common interests with their peers to develop trust for collaborative projects, if they support small group discussion, activities, and collaborative projects (Richardson et al., 2009; Peacock et al., 2020).

Social presence can be facilitated through the use of personal learning network concept maps. The findings of this study have the potential to inform the design and implementation of

online courses, and contribute to the development of effective and meaningful e-learning environments.

Further research can look into the negotiation process including social activities, membership, moderation, roles, and credibility of participants that may affect legitimacy in student experience. Additional research might look into how instructors might create course rules (i.e., netiquette) or guidelines that encourage or require participation, via self-assessment (honor pledge /statements/ rubric checklist) in discussions (e.g., journals, blogs, forms), which allow increased social presence with opportunities for connections and communication between both peers and the instructor. Future guides can be adapted to align with online content and instructional framework, research, and best practices.

## **Conclusion**

In conclusion, a strong social presence can improve the learning experience by promoting trust, communication, and group cohesion among students. The Community of Inquiry (CoI) theoretical framework provides a popular social constructivist approach for building online communities, highlighting the importance of emotional expression, open communication, and group cohesion. Instructional design elements can also play a crucial role in promoting social presence in an online course, including implementing collaborative learning strategies, designing for open communication and trust, and providing opportunities for student and teacher interaction. Additionally, educational design research can be used to address the challenges faced in online asynchronous courses by creating practical solutions that can improve student interaction with peers and instructors. Concept maps can be a useful tool for promoting social presence by encouraging meaningful learning and collaboration among students. By sharing their personal learning network with other students, students can expand their network, learn from others, and build their reputation in their field, which is their real-life social presence.

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