The community of inquiry framework and academic advising: online student perceptions

by

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B.S., University of North Carolina at Greensboro, 1995
M.A., Appalachian State University, 1996

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

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Abstract

Perceptions of online undergraduate students on academic advising experiences were informed by the community of inquiry (COI) theoretical framework and categorized by a modified COI survey. The COI framework focused on students' perceptions of their online learning environment, and acknowledged both the organizational (structural), transactional (collaborative view of teaching and learning), and social (isolation versus connected) challenges within online education. Indicators of COI included a decision-making process, open communication, shared personal meaning, and focused discussion. Thirty-four Likert-style survey items were used to measure student perceptions of three constructs within the COI framework: teaching presence, social presence, and cognitive presence. Cognitive presence included several stages: a sense of puzzlement, information exchange, connecting ideas, and resolution. Surveys were completed by online degree-seeking undergraduate students ($N = 374$, $n = 87$, response rate 23.3%) enrolled in spring one 2018 at a research one, land-grant institution. The analysis explored if COI was perceived in academic advising experiences. Perception of COI was categorized through self-reported preference of communication technologies (phone/TDD and web conferencing), demographic factors, and importance ranks on each COI item. Participants reported COI items as important, with variances between *somewhat important* and *very important*. Participants confirmed their perception of COI within academic advising with survey and open-ended comments. Analysis of data was conducted using a comparison of descriptive statistics, non-parametric tests, and qualitative coding of open-ended comments. Results of the data analysis revealed no significant differences (desirable) between advising technology (phone and web conferencing) and perception of COI. Descriptive characteristics revealed an increase in social presence with increased time with advisor and increased experience in completed online courses.

This academic advising COI study found social presence was the highest perceived presence. Analysis of comments revealed themes confirming the rank of presence in the following order: social presence, teaching presence, and cognitive. The discussion of results focused on connections to current literature, as well as implications for future research and practice. Also, the new academic advising COI instrument (modified from original) offered a valid assessment tool for online advising, with the potential for use with a variety of advisor types, models, and institutions.

Keywords: community of inquiry (COI), academic advising, higher education, online, assessment, web conferencing, social presence, teaching presence, cognitive presence, technology, online learning, student success, retention, and importance.

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Major Professor
Dr. Sarah Jane Fishback

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Chapter 1 – Introduction

Research in academic advising suggests that online students seek a personal, long-term connection with their advisors (Noonan & Stapley, 2015; Schroeder & Terras, 2015). Theories focused on online learning, such as the community of inquiry framework, provide an avenue to explore the online student experience. The community of inquiry framework is unique as it focuses on engaged and interactive online learning (Garrison, Anderson, & Archer, 1999).

In both group (online classrooms) and one-on-one settings (tutoring sessions and non-academic library workshops) a strong perception of the community of inquiry (COI) could improve student satisfaction, and ultimately retention in the online student community (Boston et al., 2010). Garrison and Arbaugh (2007) explained that social presence included "personal and purposeful relationships" (p.160), which aligned with academic advisors building rapport and trusting relationships with their advisee's. Sustained communication (cognitive presence) and facilitation (teaching presence) also fell directly under the role of an academic advisor, aligning the last two elements of the theoretical framework used in this study.

Despite advancements in communication and learning technologies from asynchronous (not in same time and space) to synchronous (same time and space), and strategies for intentional use of technology in academic advising (Steele, 2014), email remains the dominant communication tool used by advisors (Leonard, 2004; NACADA, 2011). While students reported that email had a formal tone, and telephone did not build rapport (Ladyshewsky & Pattapiece, 2015), web conferencing was considered equivalent to face-to-face interactions in dialogue complexity and depth (Abrams, Wang, Song, & Galindo-Gonzalez, 2015). Exploratory research needed to be conducted to find if online students perceived COI through their academic

experience and how students ranked the importance of COI items within their academic advising experience as categorized by the COI survey instrument scores.

Overview

In the 2015 American Colleges and State Universities survey, 63% of chief academic officers ranked online learning as a critical long-term enrollment strategy, an increase of 14.5% from 2002. Specifically, the American Colleges and State Universities survey revealed that an increase in the number of undergraduate online courses was of high priority (Allen & Seaman, 2016). In fall 2012, there were 6.7 million students enrolled online, which was significant growth from the 4 million online students reported five years earlier. Traditional main campus course enrollments were down 5.5%, while online enrollments increased 7.4% between 2012 and 2014 (Allen & Seaman, 2016).

During the same period of exploding online enrollments, and increased oversight, higher education online learning technology continued to advance from asynchronous to synchronous, allowing "variations in infrastructure and strategies" (Rennar-Petacco, Orellana, Chen, & Salazar, 2017). Web conferencing improved retention rates (Rennar-Petacco et al., 2017), and increased the sense of belonging in one-on-one interactions (Kear, Chetwynd, Williams, & Donelan, 2012). The richer synchronous communication mode added to students' social presence (or connection), especially over time (Kumar & Ritzhaupt, 2014). Finally, web conferencing had been reported to be a close approximation to face-to-face in one-on-one tutoring sessions with online undergraduate students (Kear et al., 2012). With the tremendous growth over the last decade in online education and increased competition in the online education market, student services must continue evolving to serve the support needs of online students (Ludwig-Hardman & Dunlap 2003).

Research on long-term support relationships exists in academic advising (NACADA, 2010). The student life-cycle timeline determined the length of this long-term. Academic advising is a key strategy for retention of online students (NACADA, 2011) and credited to increase course completion (Nichols, 2010). Kuhn (2008) lists appropriate verbs for this support role as "inform, suggest, counsel, discipline, coach, mentor, or even teach" (p.3).

The disconnect between the use of email by academic advisors and the student's preference for face-to-face meetings is a concern for the practitioner in the field. At the national level, this communication gap continues to appear in national survey data spanning over a decade (Leonard, 2004; NACADA 2011; NSSE, 2005, 2013, 2014, 2016). In addition to the longevity of the communication gap, these national studies report the communication gap exists across age, gender, and race demographics. Advances in communication technologies and inclusion of new theories provide the opportunity to look at the communication gap through a new lens. While there are numerous technologies that inform and assist students (website, student portal, email) this dissertation focuses on communication technology used in academic advsiing appointments. At the researched institution, the online college academic advising appointments included phone/TDD and web conferencing. The COI framework explored the importance of supportive relationships, specifically online, and elements within the COI framework satisfied the adult learning concepts of the theoretical search.

Theoretical Framework

The COI Model conceptualized by Garrison, Anderson, and Archer (1999) used three years of collected data from MBA graduate students and their asynchronous interactions and engagements within online course shells. The COI model, illustrated in Figure 1, consisted of three core elements: cognitive presence, social presence, and teaching presence. These elements

were interdependent and multidimensional (COI, 2017; Garrison, Anderson, & Archer, 1999). Garrison et al. (1999) defined cognitive presence as learning through sustained communication. Teaching presence included the *design* of the educational experience, *facilitation*, with the purpose to enhance both cognitive and social presence to achieve educational outcomes, and direct instruction (Garrison et al., 1999). Garrison and Arbaugh (2007) concluded that teaching presence was "significantly determinant" for a sense of community, student satisfaction, and perceived learning (p.163). They defined social presence as the ability to embed one's characteristics (socially and emotionally) into the community, projecting themselves as a distance education student. Social presence in an educational setting provides support for inquiry and quality interactions. Indeed, a strong perception of COI and social presence through "personal and purposeful relationships" (Garrison & Arbaugh, 2007, p. 160) can improve student satisfaction, and ultimately retention (Boston et al., 2010).

Facilitation (teaching presence), sustained communication (cognitive presence) and a purposeful relationship (social presence) are cornerstones in an academic advising relationship building a foundation to use the COI theoretical framework with academic advising. Alignment of the informational, conceptual, and relational advising components (Habley, 1986) with the cognitive, teaching, and social presence elements, of the COI framework provided further evidence to justify the use of the COI framework in this research.

Statement of the Problem

Strategies for retaining online students are increasingly important as institutions focus on increased competition for students, cost of attrition, and compliance with accreditation standards. In this data and outcome driven environment, it is essential to include online academic advising

in the institutional strategy to assist students over their entire student life-cycle (Ludwig-Hardman & Dunlap, 2003).

Unfortunately, the impact of academic advising on COI or any individual element within the COI framework is unknown. Despite the continued popularity of the COI framework in online learning communities (over 4478 citations as of April 3, 2018, in Google Scholar), and emerging research into the COI framework and one on one relationships (Stenbom & Cleveland-Innes, 2012; Stenbom, Hrastinski, Cleveland-Innes, 2016), the online academic affairs or student services literature has meager research that examined the COI framework (Lietzau & Mann, 2009), and the field of online academic advising has little to no COI research.

Purpose of the Study (research questions)

The purpose of this study was to explore how academic advising impacted online student perceptions of the three elements of social presence, cognitive presence, and teaching presence, within the COI framework. The COI instrument categorized student perceptions. Academic advising questions and analysis focused on appointment technology, type of students (demographics), and online experience, amongst other variables. Appointment technologies included phone/TDD and web conferencing. Other technologies were not included in this study as the researched online college did not consider these as appropriate for appointments.

The three specific research questions for this study are:

1. **Is there a relationship in COI scores based on preferred advising appointment technology, as categorized by the COI instrument mean score?**

   Ho = $p = 0$

   Ha = $p \neq 0$

   a. Teaching Presence

b. Social Presence

c. Cognitive Presence

d. COI framework

2. **Is there a relationship in scores of COI and its elements (teaching, cognitive, social) based on demographic characteristics?**

   Ho = p = 0

   Ha = p ≠ 0

   a. Gender

   b. Ethnicity and Race

   c. Age

   d. Number of courses successfully completed towards degree

   e. Number of courses completed online at other institutions

   f. Number of courses taken online at this institution

   g. Start date at this institution (term and year)

3. **Is there a positive relationship between presence scores (teaching, cognitive, social, COI) and importance rankings? As categorized by the COI and importance ranking scores.**

   Ho = p = 0

   Ha = p ≠ 0

Methodology

The methodology section reviewed the research design, population, and sample. Next are discussions on the protection of human subjects, and the survey instrument. Finally, procedures and data analysis concluded the methodology overview.

Research design. This research used a probability sample survey design (voluntary participation). All undergraduate degree-seeking students enrolled online for the spring semester, term one, in 2018 were asked to participate in the survey via student email, with multiple reminders. The primary dependent variable (to be affected) was the perception of the COI framework, as categorized by the COI scores, for research questions one, two, and three. Research question one focused solely on the presence of COI, as categorized by participant scores. In research question two, the independent moderator variables (may affect basic relationship with dependent variable) included demographic categories such as age, gender, ethnicity, race, experience online, number of courses, classification level, and start date. For research question three, the independent variable was the importance rank, as categorized by the ranked scores for each COI item.

Population. The study was conducted at a research one public land-grant university in the mid-west region of the United States. The unit served online students, utilizing an academic advising total-intake-model for their online degree-seeking undergraduate students. In the total-intake-model, online students received support and advising in a standardized fashion, from one central control point. In spring 2018 there were 374 students enrolled in undergraduate coursework online (P. Erickson, personal communication, January 22, 2018).

Sample. This research study sought to capture students across the undergraduate student life-cycle. All undergraduate degree-seeking students enrolled online for the spring one, 2018 term received invitations to participant in the survey via student email, with multiple reminders.

Protection of human subjects. The researcher received an Institution Review Board (IRB) approval from the University Research Compliance Office (refer to Appendix A). The online college approved to use their student population (refer to Appendix B). The survey

software Qualtrics protected and stored research data while masking individual student information from the researcher. Alias names (*online college* and *institution*) prevented identification of the population and institution after publication, and other identifiable items were removed (such as letterhead on IRB letter) or redacted to prevent identification of the population.

Survey. The survey instrument was modified from the Arbaugh et al. (2008) COI survey with 34 items using a five-point Likert scale to quantitatively measure student's perceptions of the level of the COI in online courses ($N = 287$ equaled a 43% response rate, across four institutions). The COI survey had validity (Bangert, 2009; Diaz, Swan, Ice, & Kupczynski, 2010; Shea & Bidjerano, 2008) and reliability (Arbaugh et al., 2008; Swan et al., 2008). Students responded to questions using a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The COI survey included three subscales to measure teaching presence, cognitive presence, and social presence. Also, students selected importance rankings for each of the thirty-four COI items. The rating of importance was scored using an ordinal scale with 5 = *extremely important*, 4 = *very important*, 3 = *important*, 2 = *somewhat important*, and 1 = *unimportant*. Diaz, Swan, Ice, and Kupczynski (2010) reported the Cronbach Alpha internal consistency scored higher than .85 for each of the three presences, which was high internal consistency (Gliner, Morgan, & Leech, 2009).

Email communications were not considered an appropriate technology for online academic advising appointments by the institution researched. Appointment technologies already in use included phone/TDD and web conferencing. The survey cover letter and the modified COI survey are located in Appendix C and Appendix D respectively.

Procedures. Thinking out loud cognitive interviews were held with three subject matter experts in advising, to test the modified COI survey. Final revisions were made based on the

results of student feedback through cognitive interviews (Dillman, Smyth, & Christian, 2014). Feedback from the cognitive interviews addressed issues in wording, question order, visual design, and navigation problems. Data collection included the spring one term, 2018 launch of the COI modified survey instrument using Qualtrics. Qualtrics was a comprehensive survey tool software. The Qualtrics anonymous survey hyperlink included an email with institutional encouragement and student researcher cover letter. All degree-seeking undergraduate students enrolled online for the spring one term received the survey email via their student email accounts. Data were gathered by the Qualtrics software program after IP address collection was disabled and survey protection options limited students to one response. Multiple reminders to complete the survey were sent at appropriate intervals (refer to timeline in Figure 6).

Data analysis. Data analysis included both quantitative and qualitative methods. Quantitatively, descriptive statistics (10 demographic questions), and quantitative student ratings of 34 COI items were analyzed. Qualitative analysis included the coding of open-ended questions on advising experiences through several technologies, using COI priori codes. Data analysis also included quantitative Likert-style student's ratings of the relative importance of each of the COI items and a descriptive comparison of results for COI support and COI item-importance ratings using ladder graphs.

Significance of the Study

Despite offering online student services for well over two decades, scholars called for a better understanding of how students perceive long-term online support in higher education, including advising (Hardy & Meyer-Griffith, 2012; ITC, 2011; NACADA, 2010). Additionally, researchers called for educators to understand how their students perceive their college's online community to help students connect, engage, and persist at that institution (COI, 2017; Garrison

et al., 1999, 2001). This study is unique as it expands the current COI literature to include online academic advising. The literature review revealed no research exploring the impact of long-term academic advising relationships with online students using the COI framework, or individual COI elements.

Additionally, the study is unique as it could contribute to the understanding of the importance to the student, within the context of online academic advising, of each of the 34 items that measure the three presences and COI. This understanding of perception and ranking of importance could help educators, student services, academic advising professionals, and higher education administrators design online communication strategies and services that integrate relevant COI criteria for online students. This study categorized the student importance ranking of COI criteria within online academic advising. Also, this research expanded the current research on COI importance rankings by including students who enrolled in online programs throughout the undergraduate student life-cycle (freshman, sophomore, junior, and senior).

The findings of this study also contribute to the developing concept of intentional use of technology through phone/TDD and web conferencing in online academic advising. Much of the current research in the use of technology by advising used a quantitative approach to examine staff use or used a qualitative approach to explore student preferences. Leaders have called for researchers in education to collaboratively contribute to the understanding of embedded and emerging technology and their purpose within education, as well as student support (Johnson, Adams-Becker, Estrada, & Freeman, 2014; Steele, 2014). Developing an understanding of the intentional use of technology focused on phone/TDD and webconferencing by academic advisors could help define new connections between emerging technologies like web conferencing, long-term support of online students, and the COI framework, while providing other researchers in

higher education with a new paradigm through which to observe their work with college students.

In conclusion, this study aimed to capture online student's perceptions of the COI, within the field of academic advising, and the preference of web conferencing and phone appointments. This research could be of interest to other online student service units and academic advisors, as well as those who support others from a distance in fields not related to higher education. Transferability and generalization of findings are up to each reader to evaluate.

Limitations of the Study

1. Student schedules and availability limited access.
2. The number of questions (34 Likert style questions, 10 descriptive questions, and two open-ended qualitative questions), lack of incentives, or lack of a relationship to the researcher or salience might have impacted the completion rate.
3. Data collection did not include specific advisor characteristics or advisor experience levels. The online staff academic advisors were of the same gender, and had similar years of experience.
4. Despite several phases of cognitive interviews concerning the instrument modifications, student understanding of the meaning of specific items could vary.

Definition of Terms

1. *Academic Advising*—In 2006, The National Academic Advising Association (NACADA) stated academic advising involved a curriculum, student learning outcomes, and pedagogy which build the framework for the advisor/advisee series of purposeful meetings. Kuhn (2008) expanded the definition to include an "institutional representative" (p. 3) and listed

the following verbs "inform, suggest, counsel, discipline, coach, mentor, or even teach" (p. 3).

2. *Asynchronous*—Teo, McNamara, Romeo, and Gronn (2015) defined asynchronous technologies as supporting a difference in time and place for learning. Email, instant messaging, and discussion boards were all considered asynchronous technologies.
3. *Cognitive Presence*—Is one of three COI framework elements. Garrison, Anderson, and Archer (2001) defined cognitive presence as "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse" (p. 11). Cognitive presence subset categories included triggering event, exploration, integration, and resolution. These categories formed the practical inquiry model (Garrison, Anderson, & Archer, 2001).
4. *The community of inquiry framework (COI)*—Was developed to guide research into online learning experiences from the student perspective. A deep and meaningful learning experience was at the heart of the overlap of three elements: cognitive presence, social presence, and teaching presence.
5. *Intentional use of technology model*—Steele's (2014) model organizes technology into three groups: communications technology, web-based, and enterprise systems. In the model technologies are sorted by group (i.e. learning management system belongs in the enterprize system group) and by purpose: learning, engagement, and service. The purpose of the model was to inform advisors about how technology was used successfully in the learning/teaching process, to improve virtual student services to our online students.
6. *Online Student*—A degree-seeking online student. According to Allen and Seaman (2016), 93% of online undergraduate students transfer in credits. The average age of the online

undergraduate student was 31-32, and 56% are female from a mid-range socio-economic lifestyle, and the majority of students worked two part-time jobs or full-time.

7. *Short-Term Retention*—Successful semester resulted in enrollment in the following semester; the student could pursue coursework as a full or part-time student (Rennar-Potacco et al., 2016).
8. *Social Presence*—Is one of three COI framework elements. Rourke, Anderson, Garrison, and Archer (2001) initially defined social presence as a student's ability to socially and emotionally project themselves into a community of inquiry. Since then, the social presence definition evolved to "the ability of participants to identify with the community, communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities" (Garrison, 2009, p. 352). Social presence subset categories included personal/affective, open communication, and group cohesion.
9. *Synchronous*—Teo et al. (2015) defined synchronous technologies as supporting the same time and place for learning.
10. *Teaching Presence*—Is one of three COI framework elements. Rourke et al. (2001) defined teaching presence as "the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (p. 5). Teaching Presence subset categories included design and organization, facilitation and direct instruction.
11. *Total intake model*—A total-intake-model allows for central control, where online students receive support and advising in a standardized fashion, communications via emails, and phone calls (King, 2008).

12. *Web conferencing*—A web-based synchronous video, audio and file sharing conference meeting technology.

Chapter Summary

Chapter one provided an overview of the use of technology in online academic advising for long-term relationships in higher education. The overview included an introduction to the theory of community of inquiry and addressed concerns associated with a gap in current communication habits between students and staff. The chapter described the purpose of the present study, introduced the questions addressed by this research, and examined the significance of this study for higher education. There is a gap to be filled by studying online student perceptions of the community of inquiry within online academic advising. An overview of the research methodology included the research design, population, and sample. A review covered the protection of human subjects, the COI survey, research procedures, and data analysis. The chapter concluded with the definitions of relevant terms used in this study.

Chapter 2 – Theoretical Framework and Review of the Literature

The inclusion of five sections in this literature review was necessary as multiple higher education fields of study built the foundation for this chapter, which reveals multiple gaps. An examination of significant literature shows connections between the unique online perspective of the theoretical framework and online academic advising. Another section of the academic advising literature explores the effectiveness and student perception of technology in online communications. An overview covers the traditional and evolving use of educational technology for communications, using literature focused on the theoretical framework and online learning environment. Using online classroom literature was necessary and relevant to this research as there is limited research on online academic advising. Two major gaps were revealed over the course of the literature review. First, there is little research on the student perspective of evolving communication technologies within academic advising. Second, there is no research using the theoretical framework in academic advising. Conducting a literature review of multiple areas within higher education provided a solution to address these gaps. Therefore, this literature review is divided into five major sections: theoretical framework, long-term online student support, the academic advising profession, technology and communication, and online conferencing.

The first section, theoretical framework, introduces the COI theory and three essential elements: cognitive presence, social presence, and teaching presence. The second section, online student support, covers the purpose, importance, and student perception of online student support. The support of online students requires a holistic approach, and academic advising fills the gap on how long-term relationships impact the academic success of online students. The third section, the academic advising profession, includes an overview of the advising role,

advising models, advising approaches, the advising-counseling continuum, and competencies. The fourth section, technology and communication, discusses the national research on contact between student and advisor, the communication gap between practice and preferences, and Steele's (2016) intentional use of technology model. The fifth section of this literature review, web conferencing, includes a brief overview of the history of conferencing, clarification of terms, search parameters of literature, a summary of the relevant research including research on synchronous web conferencing and the COI framework, and emerging research on one-on-one relationships.

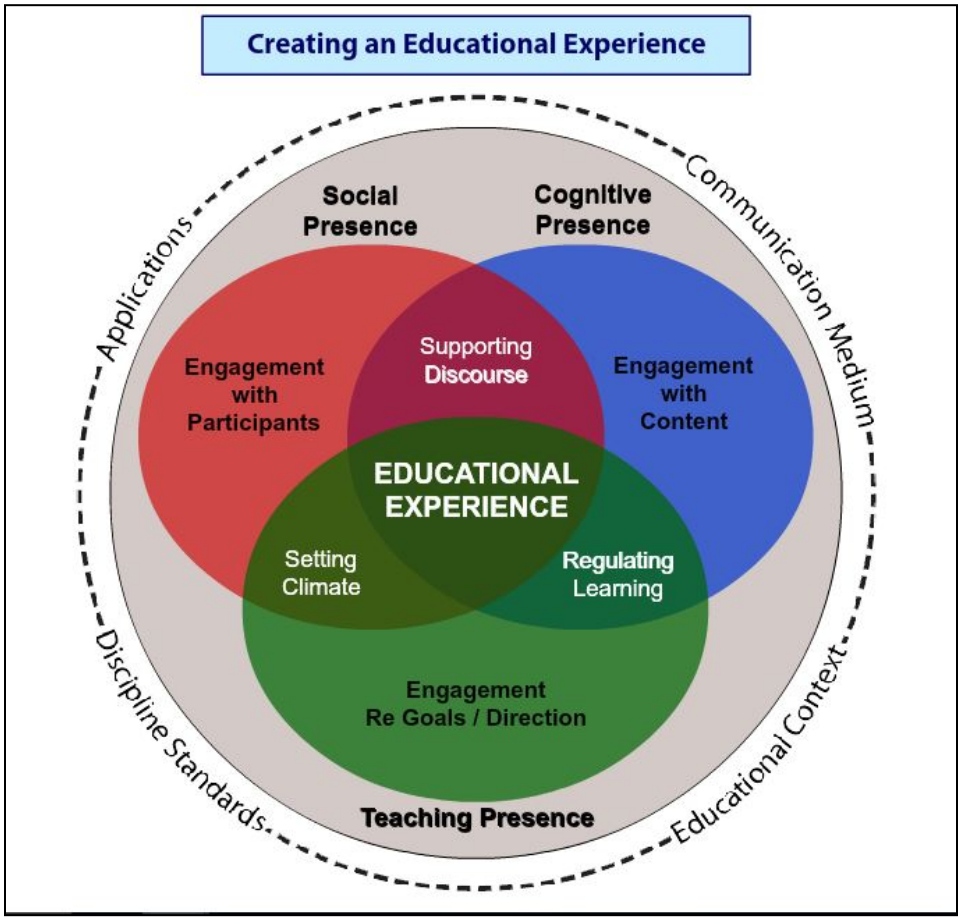
The Community of Inquiry Framework

Garrison et al. (1999) foundational work on the COI framework was developed "to provide conceptual order and a tool for the use of computer-mediated communication (CMC) and computer conferencing in supporting an educational experience" (p. 87). Computer-mediated communications (CMC) included, but was not limited to, communications via computer (i.e. email), learning management systems (i.e. discussion boards), and the internet. The term *computer conferencing* is defined as the communication and dialogue within the online class environment, to include written asynchronous communications such as discussion board posts, replies, as well as other dialogue clues such as the use of emoticons (for instance, smiley faces; Garrison et al., 1999).

The COI model was conceptualized using three years of collected classroom discussion board dialog from higher education graduate MBA students and their interactions and engagements within online courses (Garrison et al., 1999). Illustrated in Figure 1, the COI model consists of three core elements: cognitive presence, social presence, and teaching presence which were both interdependent and multidimensional (COI, 2017; Garrison et al., 1999).

Figure 1

The Community of Inquiry Framework (2016)



Note. Appendix E includes D. Randy Garrison's approval for the use of this image. Adapted from *Community of Inquiry* [website]. Retrieved May 28, 2017, from https://coi.athabascau.ca/

According to Garrison et al. (1999) the first element, cognitive presence, was essential to success in higher education. They defined cognitive presence as meaning-making through sustained communication. Garrison et al. (2001) clarified cognitive presence further, adding "critical, practical inquiry" in the meaning-making process. The second core element, social presence, is the ability to embed, through different mediums, one's characteristics (socially and emotionally) into the community, projecting themselves as a real person (Garrison & Arbaugh, 2007). The third element, teaching presence, begins with pre-class organization and design,

followed by in-class facilitation of dialogue and direct instruction (Garrison et al., 1999). Garrison and Arbaugh (2007) later surmised that teaching presence was the most significant influence on student satisfaction and perceived learning, as well as building a sense of community.

Each of the three essential elements, were visualized as three circles that have an overlap. Factor analysis confirmed the structure of the framework (Arbaugh & Hwang, 2006; Garrison, Cleveland-Innes, & Fung, 2004). An almond shape appears where two core element circles overlap. The almond overlap between cognitive presence and teaching presence is *regulated learning* (COI, 2017), which in the original model was called *selecting content* (Garrison et al., 1999). The overlap between social presence and teaching presence is called *setting climate* (COI, 2017). The almond overlap between social presence and cognitive presence is called *supporting discourse.* Finally, where all three elemental circles overlap, a triangle core is formed, which represents the *educational experience* (COI, 2017). Refer to Figure 1 to see the complete COI framework.

Cognitive Presence

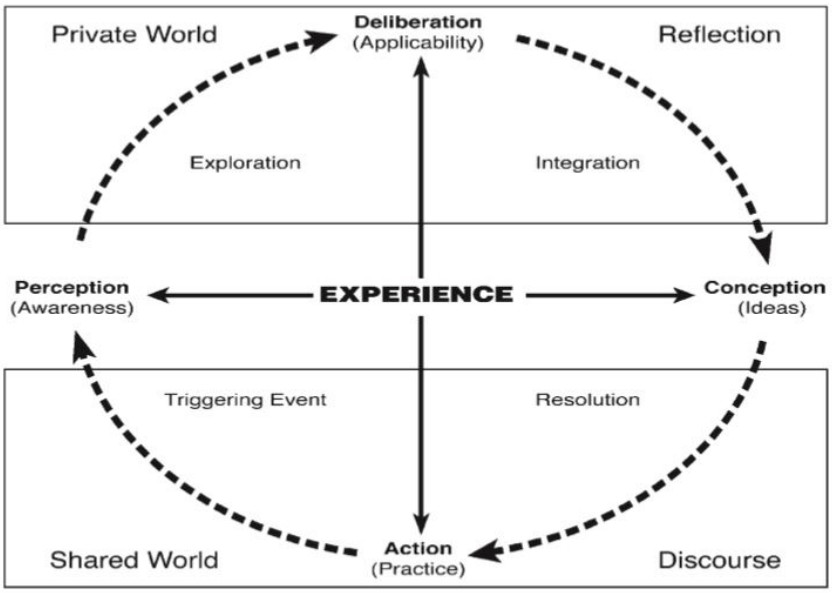
The first COI element, cognitive presence, is defined as meaning-making through sustained communication (Garrison et al., 1999). Categories within cognitive presence include triggering event, exploration, integration, and resolution. The same four categories were operationalized into the practical inquiry model shown in Figure 2 (Garrison et al., 2001).

According to Garrison et al. (2001), from a critical thinking perspective the practical inquiry model is comprehensive because it includes intuition, problem-solving, creativity, and insight. The model begins with a *triggering event* or dissonance, and then awareness of the dissonance, which results in *exploration*. Garrison et al. (2001) explained once information was

collected, a *deliberation* process retains information that was deemed applicable. Finally, *integration* of retained information either reveals further dissonance or *resolves* the current triggering event. According to Garrison et al. (2001), intuition and insight explain any skipped phases in the practical inquiry model.

Figure 2.

Cognitive Presence – Practical Inquiry Model



Note. Appendix E includes D. Randy Garrison's approval to use this image. Adapted from *Community of Inquiry* [website]. Retrieved May 28, 2017, from https://coi.athabascau.ca/

In the first research on cognitive presence (graduate level, two courses, $N = 22$, 75 messages coded from discussion board communications) Garrison et al. (2001) argued that a third of the dialogue was not relevant to cognition, and half was coded as exploratory or as a triggering event. Garrison and Arbaugh (2007) speculated that cognitive presence within the online course framework rarely developed past the exploration phase. They suggested that teacher presence and time could be either inhibitors or essential support for cognitive presence.

For example, in the cognitive presence practical inquiry model, the integration and resolution phases required more time for reflection. Additionally, purposeful design (an indicator of teaching presence) of practical application activities provided students a pathway to seek integration and resolution.

Online academic advising could accommodate the need for extended time and practical application activities in developing a cognitive presence. Academic advising serves as a vehicle for offering long-term support provided over the entire student life-cycle. Practical application activities (such as self- assessment tests) could address a triggered issue or concern from the student. Connection with academic advising is often a help-seeking activity after a student had explored options, but they need scaffolded support to integrate information and assistance to evaluate options and resolve the situation. Taking a career-interest test and discussing relevant course electives can alleviate concerns about degree alignment. This is just one example of how online advising appointments and support can help a student with integrating new information, assist with practical applications, resolve a triggered event, and complete all steps in the practical inquiry model within cognitive presence.

Social Presence

The second element of COI, social presence, is a function of support for cognitive presence (Garrison et al., 2001). Social presence is a direct influence on affective goals, such as enjoyable group interactions or personal fulfillment. Garrison (2011) introduced a revised definition of social presence "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 by way of projecting their individual personalities" (p. 34). This definition is supported by Oztok and Brett (2011), who examined the concept of social presence

over the last fifty years. According to Oztok and Brett, three research themes emerged in the social presence literature. The themes include a relationship with a sense of community, interactions and behavior, and success and satisfaction (Oztok & Brett, 2011). Bower (2001) identified three stages in online community building: acquaintance making, membership making, and camaraderie. Bower's (2001) three stages align with the coding themes of social presence. Categories within social presence included open communication, group cohesion, and affective expression (Garrison et al., 2001). In other words, casual and social interactions (open communication similar Bower's acquaintance making) evolved into academic specific communications (group cohesion similar to Bower's membership making). Finally, after comfort and trust developed, personal relationships were formed (affective expression similar to Bower's camaraderie; Garrison & Arbaugh, 2007).

According to Garrison and Arbaugh (2007), the purpose of social presence in an educational environment is to provide support for quality interactions and inquiry. All the research using the COI instrument in the online classroom ranked social presence last, while teaching presence scored highest, and cognitive in the middle (McKerlick, Anderson, Riis, & Eastman, 2011). Time and interruption of group dynamics, and reforming as a group in each new class offered possible explanations for the consistent lower social presence scores spanning a decade of research (Garrison & Arbaugh, 2007). However, recent research on long-term cohorts, where students formed and maintained a strong bond with others, revealed an increased social presence over time between year one and two (Kumar & Ritzhaupt, 2014). Kumar and Ritzhaupt (2014) studied Ed.D. students in the Educational Technology cohort ($N = 18$, 89% response rate). Despite student perception of social presence as scoring lower in the COI framework, one should not dismiss its importance. Two of three affective expression questions

(indicators of social presence) in the COI survey accounted for almost 92% of the total variance in student re-enrollment (Boston et al., 2010). COI item 16, *online or web-based communication, is an excellent medium for social interaction* was credited with almost 81% of the total variance. While COI item 15*, I was able to form distinct impressions of some course participants* was credited with 11% of the total variance with student re-enrollment. In other words, Boston et al. (2010) found that there was a predictive relationship between social presence in the COI instrument and retention (N = 28,877 online bachelor of art students, M_{age}=28.2, 68% male, 38.91% response rate).

Teaching Presence

According to Garrison et al. (1999) the third element of COI, teaching presence, could be "performed by any one participant in a Community of Inquiry" (p.89). In their decade long research, Garrison, Anderson, and Archer (2010) defined teaching presence as the facilitation, design, and direction of social and cognitive processes to obtain meaningful learning outcomes. Categories within teaching presence include design and organization, facilitating discourse, and direct instruction. In other words, structure, organization, and leadership (teaching presence) were necessary to support students beyond social and cognitive presence, to a more complex social cohesion and higher-level integrations of knowledge to ensure effective online learning. Garrison and Arbaugh (2007) suggested that teaching presence is critical to the development and maintenance of a sense of community, student satisfaction, and perceived learning. Online academic advising provides directed instruction by way of a subject matter expert, where diagnosing comments for accuracy, scaffolded resources for integration, and resolution of problems was critical to supporting online students. Indeed, the academic advising profession aligned their field with direct instruction by incorporating advising as teaching into the *Concept*

of Advising (NACADA, 2006). This is essential as teacher presence, or ongoing guidance, is related to a student's sense of connection and learning (Shea, Li, & Pickett, 2006).

Online Student Support – Constant Link for Online Students

The online student support section of the literature review covers the purpose, importance, and student perception of online student support. Online student support strategies encourage expanding beyond the short-term classroom to a long-term student life-cycle approach. Since 2004, the Instructional Technology Council (ITC) has administered an annual survey to member institutions, primarily community colleges, concerning challenges and trends in distance learning (Instructional Technology Council, 2012). According to ITC, 2011 was the first year ($N = 143$) participating institutions reported offering adequate student services online as the greatest challenge. One of the key components of effective online student services support is advising and counseling, yet only half (49%) of institutions reported offering such services (Instructional Technology Council, 2012).

According to Newberry & Deluca (2014), the support strategies for retaining online students must expand beyond offering on-campus services to online learners. It requires a holistic and networked approach to leverage existing technologies, and an institutional commitment to online learners. According to Ludwig-Hardman and Dunlap (2003), student support services were successful in assisting and serving a student over his or her entire student life-cycle. The literature implied that online assistance, professional standards, and university commitment to a holistic support strategy positively impacts online students' retention, course completion, and student perception of support. However, research on online student support (for the duration of their student life-cycle) was meager.

Once an adult student has exhausted all other available options, he or she asks a question to staff at the university or college (National Survey of Student Engagement, 2016; Powers, Carlstrom, & Hughey, 2014). How support staff respond to these inquiries reflects directly on the commitment the university made to incorporate a cohesive customer service approach (Gordon & Habley, 2000; Shillington et al., 2012). The response from the school either confirms the institution's commitment to serving their students or undermines the relationship between the student and his or her institution (Hardy & Meyer-Griffith, 2012; Newberry & Deluca, 2014; Powers et al., 2014).

Ludwig-Hardman and Dunlap (2003) shared a non-research program review of their university's scaffolding of student support services, which addressed several online student retention challenges: feelings of isolation, lack of self-direction and management, and eventual decrease in motivation levels. Tait (2000) described three central functions for online student support services: cognitive, affective, and systematic. A focus on cognitive outcomes (belonging, interaction, a member of the community) led to creating a learner support services program "where students feel at home, where they feel valued, and which they find manageable" (Tait, 2000, p. 289). According to Ludwig-Hardman and Dunlap (2003), unlike the temporary support a single instructor/course provided, scaffolding student support services were successful in assisting and serving a student over their entire student life-cycle. Other scaffolding activities such as orientation, one-on-one advising, and access to an online community of learners also provided an opportunity for social interaction outside of the online class environment. Unfortunately, Ludwig-Hardman and Dunlap (2003) included no data to support these claims. However, an autoethnographic study on Ph.D. advising ($N = 3$), by Harding-Dekam (2012),

found that a positive long-term relationship, between student and advisor requires the creation of trust in the relationship, lending support to Ludwig-Harman and Dunlap's ideas.

Nichols (2010), to better understand student perceptions of support services in distance education, focused on targeted interventions and their influence on retention using a mixed method approach (survey and interviews, $N = 51$, over a 50% response rate for the two-year study). The introduction of four student support interventions (readiness for distance education survey, orientation, supportive communications from staff, and personal contact), increased first-time student course completion by 24.7%, compared to the previous year's first semester (Nichols, 2010). The meager online student support literature, which was at the student services level, supported Britto and Rush's (2013) statement that the functional area of academic advising remained the primary link between online students and the institution. Advising is where the bulk of research on long-term support of students resided. In other words, the primary long-term contact for online students, other than faculty, was their academic advisor (NACADA, 2010; Tones, Fraser, Elder, & White, 2009).

The Academic Advising Profession

The academic advising profession section includes a brief overview of the history and development of the advising profession. An introduction to multiple advising approaches includes: prescriptive, proactive, developmental, appreciated, and strengths based. As shown in the advising-counseling continuum, the choice of advising approach is dependent on the purpose, content, focus, and time available with the student. First, a brief history is discussed, providing context to the concept of advising as teaching in the academic advising field. After discussing the concept of advising as teaching, an examination of three advising components, their competencies, and connection to COI concludes the section.

The National Academic Advising Association (NACADA) was founded in 1979 to promote quality academic advising in higher education and has continued improving support for the academic advising profession and growth across higher education (Miller & Thurmond, 2006). NACADA developed the core values in 2004 (NACADA, 2005). In 2006, NACADA stated that academic advising involves a curriculum, student learning outcomes, and pedagogy, which built the framework for the advisor/advisee chain of purposeful meetings. Academic advising refers to providing the student with information on a variety of topics, including: registration, orientation, planning a course of study, scheduling classes, and career planning and placement (Beitz, 1987).

Academic advising is the constant formal link between the institution and students, including identifying and advocating against problematic policies and procedures (Polson, 1994a; Polson & Vowell, 1995; Swecker, Fifolt, & Searby, 2013; Young-Jones, Burt, Dixon, & Hawthorne, 2013). The advisor role is critical to resolving any problems between institution and individual (Britto & Rush, 2013). Departmental advising, either by staff or faculty, is an essential component utilized to provide customized degree preparation and provide support within the field for those with custom career and post-education goals (Gordon & Habley, 2000).

Organizational models of academic advising included decentralized models, centralized, and shared models. The 2011 National Academic Advising survey asked institutions ($N = 770$) to declare which of five organizational models they used: Faculty only (decentralized), self-contained (centralized one stop shop), shared supplemental (shared between faculty advisors and small advising unit for support), split (a shared model where duties are split between the advising office and academic unit), and the total intake model (shared, where all initial advising is through one office (King, 2008). According to the National Academic Advising survey the faculty-only

model was used at 17.1% of institutions (Carlstrom & Miller, 2013), down from second of five at 25% as reported in the American College Testing (ACT) 6th survey (Habley, 2004), and down from the ACT first survey in 1987 which reported 33% (Habley & McCauley, 1987). Carlstrom and Miller (2013) found that the faculty-only advising model was still the preferred model where faculty did advising in small institutions and in private institutions. In contrast to faculty advising, use of the other four organizational models have increased. The self-contained model saw an increase from 14% in 2003 to 28.6% in 2011 (Carlstrom & Miller, 2013; Habley, 2004). The split model saw an increase, maintaining first place, from 27% in 2003 to 39.4% in 2011 (Carlstrom & Miller, 2013; Habley, 2004). The self-contained and split models tied for the most popular model with large institutions, public bachelors and masters institutions, and those institutions who had full time advising staff. The total-intake model was the second most used model for institutions with full time advising staff. The total-intake model saw an increase from lowest of the five models at 6% in 2003 to third at 16% in 2011 (Carlstrom & Miller, 2013; Habley, 2004). The shared supplementary model was more popular than total-intake in 2003, with a use of 14.2% across institutions, but fell to the lowest of the five models in 2011 with 14.2% (Carlstrom & Miller, 2013). The total-intake model had the most improvement, with a jump from last to the middle of the five models in eight years from 2001-2003.

A total-intake-model allows for central control, where online students receive support and advising in a standardized fashion, communications via emails, and phone calls (King, 2008). The organizational structure within the online college provides unique capabilities and strengths in service, as the student remains assigned to the same academic advisor throughout the entire student life-cycle. According to King (2008), this advising total-intake-model's "key strength is the ability to front load the system and to provide a strong start for students" (p. 248). Academic

advising assists students in completing their degree programs through many approaches (Bland, 2003; Drake, 2011; Swecker et al., 2013).

Advising theories and approaches. Originally, when curriculum was set without electives, the original academic advising theory was prescriptive (Gordon & Habley, 2000). In the 1970's, the profession of academic advising matured and grew, and became student focused (Gordon & Habley, 2000). Two landmark theorists, O'Banion and Crookston propelled academic advising from an institution-centered approach to a student-centered and learning-centered approach (Crookston, 1972). This new student-centered focus generated new theories, to include proactive (Gordon & Habley, 2000), developmental (Crookston, 1972) and appreciative (Bloom & Martin, 2002).

Prescriptive Advising. The term prescriptive means completion of a specific task list or receipt of exact instructions concerning how someone should accomplish a task (Crookston, 1972). Prescriptive advising is directive conversation from advisor to student, where the advisor held the power (Bland, 2003). The conversation merely addressed course selection and academic regulations. A prescriptive approach gave the student no voice (Bland, 2003). The advisor often reverted to the role of clerk (Polson, 1994a). Additionally, Punyanunt-Carter & Carter (2015) described the advisory role as an expert where an interpersonal relationship would not occur naturally.

Developmental Advising. Developmental advising focuses on the development of the whole student (Bland, 2003; Polson & Others, 1986; Polson, 1994a). O'Banion (1972) provided a structure with five steps, which helped define the scope of academic advising (Kasworm, Polson, & Fishback, 2002; Polson, 1994a). The advisor and advisee were to discuss the five steps together, and those included: life goals, career goals, program choices, courses, and

scheduling (Kasworm et al., 2002). O'Banion's model has been compared to developmental academic advising literature and was found similar in philosophical approach, where the student was responsible for decision making throughout the process (Polson, 1994b). However, O'Banion's model lacked the importance of providing support, which is considered a critical component in Crookston's approach (Polson, 1994b).

Crookston (1972) coined the phrase developmental advising and defined it as including concern for vocational and personal goals, and also improving the student's awareness of behavior, decision-making and problem-solving, and interactions and evaluation skills (Erlich & Russ-Eft, 2013). The goal included developing self-reflection, a sense of belonging on campus, and forming relationships (Crookston, 1972). Expansive conversations continued over a long period, allowing the advisor to assist the student in formulating questions and empowering the student to explore all options. Students had ownership in the decision-making process and found answers to their questions. Advisors monitored the student's progress with continuous proactive focus during the semester, not just during registration time. On the other hand, Schreiner and Anderson (2005) critiqued developmental as a "deficit-based philosophical approach to improved success" (p.21). Appointments filled with probing questions concerning student's weaknesses could easily reduce academic hope, motivation, and effect morale (Schreiner & Anderson, 2005).

Strengths-Based Advising. Schreiner and Anderson (2005) introduced strengths-advising as an alternative to American higher education deficit-based approaches, which focuses on weakness. Although some improvement could be gained by working on weak areas, they failed to reach levels of excellence. The strengths-based concept originated with the Gallup organization, who found that individuals were only able to achieve average performance when

focusing on areas of weakness (Clifton & Anderson, 2002). Strengths-based advising, as conceptulaized by Schreiner and Anderson, focused on student growth from a positive psychology approach where a person has what they need to succeed through natural aptitudes known as talents. They explained that academic knowledge and skills could turn these talents into strengths by building self-confidence and motivation to achieve levels of excellence. In other words, the dialogue shifted from problems to possibilities (Schreiner & Anderson, 2005).

Appreciative Advising. Appreciative advising focuses on using the appreciative inquiry (AI) approach to purposefully search for the best in students (Bloom & Martin, 2002). Bloom and Martin (2002) introduced the AI approach, formerly an organizational tool, as a customizable approach for individual development. The four steps of appreciative individual development includes discovery, dream, design, and destiny. The discovery process involves interviewing students with positive, affirmative questions. According to Bloom and Martin (2002), the dream process builds upon strengths, interests, and goals identified in interview answers. The design involves skill development and long and short term goal strategies. Finally, destiny involves a process where a student accomplishes goals while the advisor provides moral support and guidance.

Proactive Advising. Proactive advising was formerly called intrusive (Swecker et al., 2013). The advisor is responsible for making initial contact with the student. Advisors establish and maintain a relationship through a proactive, high-involvement, caring, and direct approach. Some researchers recommended this approach for both first generation (Young-Jones et al., 2013) and academically at-risk students, as long as the advisor practices proactive outreach (Swecker et al., 2013; Young-Jones et al., 2013).

The NACADA Core Values stated that no theory or approach was in higher regard than another (2005). Regardless of theory, the recipients of academic advising included students, institutions, and society (NACADA, 2005). In recent years, some theoretical discussions gained clarity; whereas developmental advising theory concerned the content of advising, prescriptive was a style of advising (Lowenstein & Stockton, 1999), or an approach (Williams, 2007). NACADA supported the new distinction between theory and approach in their publication titled *Academic Advising: A Comprehensive Handbook,* 2nd Edition (Gordan, Habley, Grites, & Associates, 2008). Developmental advising was discussed as a theory. Meanwhile, a section titled "traditional normative approaches" (p.19) included both developmental and prescriptive approaches (Hagen & Jordan, 2008). To help align advising approaches with advisor responsibilities Kuhn, Gordon, and Webber (2006) introduced an advising-counselor continuum of responsibilities.

The advising-counseling continuum and competencies. Five levels of involvement are included in the Kuhn et al. (2006) advising-counseling continuum of responsibilities. Table 1 shows the five levels of involvement in the left column, starting with informational, which is the least complex (refer to left column, row two). The column headers represent the advisor's role, comfort level, and staff responsibilities (Kuhn et al., 2006).

Second, the student's need also influenced the approach, as it pertained to the purpose, content, and focus of the appointment (reading across the row). Triggers for referral include students who experienced anxiety or indecisiveness, according to Steele and McDonald (2008). The complexity of each case/appointment influenced the level of involvement (Kuhn et al., 2006). In other words, the simplicity or complexity of each student's appointment impacted the advisor's range of movement (up or down) on the continuum.

Table 1

The Advising-Counseling Responsibility Continuum

Approach	Purpose	Content	Focus	Length of Contact	Staff Responsible
Informational	Informational	Information	The information	5-15 minutes	Advisor
Explanatory	Clarification	Procedures	The institution	15-30 minutes	Advisor
Developmental	Insights	Opinions and values	The student	30-60 minutes	Either/or Advisor Counselor
Mentoring	Growth	Values	The person	Long term relationship, time varies	Either/or Advisor Counselor
Counseling	Identify problem	Design resolution	Behavior modification	Dependent on problem severity	Refer to a counselor.

Note. Adapted from Kuhn, T., Gordon, V. N., &Webber, J. (2006). The advising and counseling continuum: Triggers for referral. *NACADA Journal, 26* (1), 24-31. doi: 10.12930/0271-9517-26.1.24

Although few research articles addressed the advising-counseling continuum directly, support for this approach appears to be growing. Gravel (2012) studied undergraduate students online and their interactions with advisors ($N = 236$, 83% response rate) using the Winston & Sandor's Academic Advising Inventory (Gravel, 2012). Findings suggest that systematic, affective, and cognitive support needs to be more collaborative and personalized. Gravel (2012) advocated for academic advising professionals to start thinking of interactions with students as a two-way continuum that spans from prescriptive to developmental. This continuum idea from prescriptive to developmental supports Smith and Allen's (2006) findings of 12 highly important academic advising functions. In a study of essential functions in academic advising,

undergraduate students ($N = 2193$, $M_{age} = 26.5$, 18.3% of target population responded) prioritized the *ability to give accurate information* (a prescriptive task) as number one, over other developmental tasks (Smith & Allen, 2006).

In a thinking article, Jordan (2000) aligned the prescriptive and developmental approaches with technology. Simple informational and explanatory needs were satisfied by prescriptive communication methods such as websites and emails (Jordan, 2000). However, the more complex developmental dialogue was served better by phone or video conferencing (Jordan, 2000).

The advising-counseling responsibility continuum helped define the depth and limitations of advising versus counseling, based on the comfort level of the advisor and restriction of the job responsibilities (Kuhn et al., 2006). Lowenstein (2005) proposed that advising with a learner-centered focus is teaching, because the student learns about the logic of their entire curriculum with their advisor, as they would learn in a classroom with their instructor about the course content.

Advising as teaching. Advising as teaching is a strong theme in literature (Crookston, 1972; Lowenstein, 2005). Advising as teaching was officially incorporated into NACADA's (2006) *Concept of Advising,* which includes: curriculum, pedagogy, and student learning outcomes. Trabant (2006) introduced the idea of an advising syllabus, transitioning the classroom tool into an education tool. The syllabus would include the definition of advising, contact details, and an outline of the advisor-student relationship, with expectations and responsibilities for both student and advisor (Trabant, 2006). Students and advisors could then be held accountable to fully participate in procedures, tools, resources, recommendations, and appointments (Trabant, 2006). Trabant (2006) added that assessment is then possible, as

parameters are set from written expectations and outcomes. NACADA adopted the syllabus idea by providing an advising syllabus resource page housed in the Clearinghouse, which includes multiple articles, resources, and twenty or so links to institutional advising syllabi (2017). The next step in understanding an advisor's responsibilities requires a look at three principal components (*component* term used first by Hably, 1986). Further analysis of the three components reveals several sub-competencies within each component (Mahoney, 2009), which were necessary to be an effective advisor.

Advising components align with community of inquiry elements. Habley (1986) outlined a framework, which includes three components: informational, conceptual, and relational. The conceptual component provides the context for service delivery, while the informational context provides the content (Habley, 1986). The relational factor refers to personal skills, without which the interpersonal relationship and rapport with students would suffer. The concept of advising as teaching and the alignment between advising components (informational, conceptual, and relational) and COI elements (cognitive presence, social presence, and teaching presence) grounds the COI theoretical framework to the literature and forms the rationale for using the COI framework within this research.

Informational advising component aligned with COI cognitive presence. The first advising component, informational, has always been a part of advising (Fox, 2008). Higginson (2000) used the term "substantive information" (p.303) when describing four critical knowledge areas that advisors must know to provide information correctly: procedures, policies, law, and resources. Mahoney (2009) organized informational competencies into three categories: institutional specific, technological competencies, and student assessment. A priori codes for the COI cognitive presence included recognizing a problem, information exchange, suggestions,

brainstorming, solutions and applying new knowledge. Table 2 shows the alignment of informational advising components with the COI Cognitive Presence.

Table 2

Informational Component aligned with COI Cognitive presence

Informational Advising Component	Community of Inquiry Cognitive Presence
Institutional Specific Technology	Course Content Technology
Student Assessment Purpose: How to progress toward graduation	Student Assessment Purpose: Meaning-making through sustained communication
Developmental approach: Form questions, exploration, evaluation, decision-making, decision. Long period over entire student life-cycle	Practical Inquiry model: Triggering event, exploration, integration, and resolution. Time limited to course dates
Outcome: Informed Decision Making	Outcome: Critical Thinking process

Institutional specific competencies include degree requirements and curriculum options, and dates and deadlines. Technological competencies include student information systems, online information, and digital communication. Student assessments include personality and interest inventories, and self-assessment activities. Teaching students how to progress toward graduation, prepare for employment, and navigate their institution is very important to their continued success (Mahoney, 2009). Nutt (2003) concluded that the informational component is about the facts and processes necessary to successfully guide a student through the completion of their degree to graduate. Strong connections in Table 2 between informational and cognitive

presence appeared in several areas, such as the decision-making process, technology, student assessment, and outcomes.

Conceptual advising component informs COI teaching presence. The second advising component, the conceptual component, requires the advisor and student to address micro-level concerns (i.e. course planning), the macro-level (i.e. academic world and the world of work), as well as the advisor awareness of student development and learning theories (Fox, 2008; Habley, 1986). Higginson (2000) defined the conceptual component as two-fold: understanding the student and understanding the role of advising within the institution. Mahoney (2009) organized conceptual competencies into academic advising principles, student development theory, and career development theory. First, academic advising principles include the mission of advising, professional standards, and core values of academic advising. Second, a basic overview of student development theory includes identity development, intellectual development, and transition theory (Mahoney, 2009).

Finally, a basic overview of career development theory includes personality type and person-environment fit, cognitive information processing, values-based career decision-making, social learning, and planned happenstance (Mahoney, 2009). McClellan (2007) concluded that overall, the conceptual component informed advising practice. A priori codes for the COI teaching presence included diagnosing misconceptions, responding to technical concerns, and summarizing the discussion. Strong connections in Table 3 between Habley's (1986) conceptual advising component and knowledge, a subcategory of teaching presence, appeared in most areas including role responsibilities, student development theory, and the use of a syllabus as an educational tool.

Table 3

Conceptual Component informs COI Teaching presence

Conceptual Advising Component	Community of Inquiry Teaching Presence -Knowledge
Advising Responsibilities: • Curriculum with expectations • Student learning outcomes • Offer variety of learning experiences • Assessment to determine level of achievement	Teaching Responsibilities: • Curriculum with expectations • Student learning outcomes • Offer variety of learning experiences • Assessment to determine level of achievement
Student Development Theory: • Psycho-social identity • Cognitive-development • Personal type theories (i.e., learning style or personality)	Student Development Theory: • Psycho-social identity • Cognitive-development • Personal type theories (i.e., learning style or personality)
Other Relevant Frameworks: • active guidance, advising as teaching • subject matter expert • scaffolding support	Pedagogy: • Direct instruction • Instructional Design • Organization of content
Educational Tool: Syllabus	Classroom Tool: Syllabus

Relational advising component aligned with COI teaching presence. The third academic advising relational component aligns with both the interpersonal aspect of the COI teaching presence (refer to table 4) and social presence (refer to table 5). The personal aspect, or interpersonal relationship between advisor and advisee, is desired in some of the newer student-centered advising approaches (Habley, 1986). The relational component also attempts to explain how the teacher-student interpersonal relationship influences student understanding, information assimilation, and application of learned skills outside of the advising session (Fox, 2008; Habley, 1986). Higginson (2000) explained that knowledge (from the other two components) conveyed

through a relationship built on effective communication and interpersonal skills is an effective advising strategy. Mahoney (2009) organized relational competencies into building rapport, interviewing, and influencing development. First, building rapport includes appreciating the individual, presence, and compassion. Second, interviewing involves effective questioning, verification, active listening, and identification of positive attributes. Finally, influencing development includes modeling, coaching, challenging, and creative imagining (Mahoney, 2009).

Aragon (2003) also wrote about building instructor social presence in an online classroom, dividing his thinking article into three sections. The first section, course design strategies, fell directly into the realm of COI teaching presence, as well as Aragon's (2003) section on instructor strategy. Course design strategies include the use of welcome messages and an introduction space where students uploaded personal profiles. Aragon (2003) suggests small class sizes and collaborative learning activities. More specifically, teaching strategies for an increased presence in online environments includes shared personal stories, immediate feedback, and activity on the discussion board to include the use of names, humor, and emoticons. Finally, immediacy in promptly answering requests added to teacher presence and reduced isolation. A priori codes for the COI teaching presence with a relational focus included encouraging, acknowledging, or reinforcing student contributions, setting climate for learning, and promoting discussion. Table 4 offers evidence to suggest an alignment between Habley's (1986) relational academic advising component and the intrapersonal dimension of the COI teaching presence.

Table 4

Relational Component aligned with COI Teaching presence

Relational Advising Component	Community of Inquiry Teaching Presence - interpersonal
Building rapport • Appreciate individual • Presence • Compassion	Leadership • Interpersonal relationship • Welcoming Messages • Student profiles • Small class size • Share personal stories
Interviewing • Effective questioning • Verification • Active listening • Identification of attributes	Facilitation • Assessing understanding • Information assimilation • Collaborative learning activities • Use names, humor, emoticons • Immediate feedback • Promptly answer emails
Influencing Development • Modeling • Coaching • Challenging • Creative imagining	Influencing Development • Application of learned skills • Active on Discussion Board • Promptly answer email
Outcome: Facilitate relevant educational plan allowing for student's intellectual and social development in and outside of the classroom	Outcome: Significant determinant for sense of community, student satisfaction and perceived learning

Overall, Table 4 illustrates the overlap of responsibilities and best practices, such as building rapport, leadership, facilitations, interviewing, and influencing the development of a student. Garrison and Arbaugh (2007) suggested that teaching presence is a significant determinant of student satisfaction, perceived learning, and sense of community. Ke (2010) discovered that teaching presence reinforces both cognitive and social presence using both

interviews (*n*=16), course artifact and discourse analysis, and three surveys (response rates varied from 20-62%, no participant *n* per survey was provided). Ke studied both graduate and undergraduate online courses focused on adult students attending a historical Hispanic institution (age range 24-59, 36% minority, 60% female).

Relational advising component and social presence. The purpose of social presence in an educational environment is to provide support for quality interactions and inquiry (Garrison & Arbaugh, 2007). Interaction in education is not new. Dewey (1916) defined internal interaction as the moment when a student makes meaning from inert information passed to them from someone else, with personal appreciation and value. In their seminal article on distance education interactions, Daniel and Marquis (1979) challenged their educational peers to find a balance between activities of independent study and interactive learning. Moore's (1989) theory of transactional distance proposed the flexible nature of interactions in distance education delivery models could overcome distance educations lack of structure. Wagner (1994) defined interactions as "reciprocal events that require at least two objects and two actions. Interaction occurs when these objects and events mutually influence each other" (p.8). Rourke et al. (2001) found three interaction coding themes when they conducted transcript analysis for social presence: affective, interactive, and cohesive. Table 5 illustrates how these three interaction themes align with the academic advising components. Affective interactions express emotions and feelings, which are a part of Habley's (1986) relational academic advising component. Affective interaction messages of affiliation build a connection to the campus, as messages of warmth, affection, or humor provide a sense that someone is looking out for you.

Rourke et al. (2001) defined interactive interactions as a provoked response in acknowledgment of a message. Cohesive interactions build a sense of commitment to the group

using inclusive group language (Rourke et al., 2001). Online academic advising components align with these interactive, affective, and cohesive ideas within social presence. A priori codes for the COI social presence included asking questions, complimenting, expressing appreciation, and expressing agreement.

Table 5

Relational Component and Social Presence

Relational Advising Component	Community of Inquiry Social Presence
• Connection to campus	• Affective interactions – expressing emotions and feelings – affiliation messages
• Someone is looking out for you	• Affective interactions – expressing emotions and feelings - warmth, attraction, openness, humor messages
• Student engagement outside of the classroom	• Informal cohesive interactions outside of formal classroom (for instance student email)
• Collaborative long-term partnership	• Cohesive interactions – develop and maintain a sense of commitment to the group (use of we, our, us)
• Interactive process	• Interactive interactions- implicit or explicit acknowledgment to someone that their message provoked your response
• Student plays active role	• Participation influenced and motivated by affective, cohesive and interactive interactions

In summary, Habley's (1986) three advising components continue to develop into advising competencies (Higginson, 2000; Mahoney, 2009; McClellan, 2007; Nutt, 2003). Advising components (Habley, 1986) and their competencies (Mahoney, 2009) were shown to align with the three elements of the COI theory, which is the theoretical framework for this study. Specific skills or responsibilities are tied to specific elements of the COI framework in Tables 2, 3, 4, and 5. To better understand the holistic alignment and relationship between COI and the advising components refer to Figure 3.

Figure 3

Alignment of Advising Components and COI Theory constructs

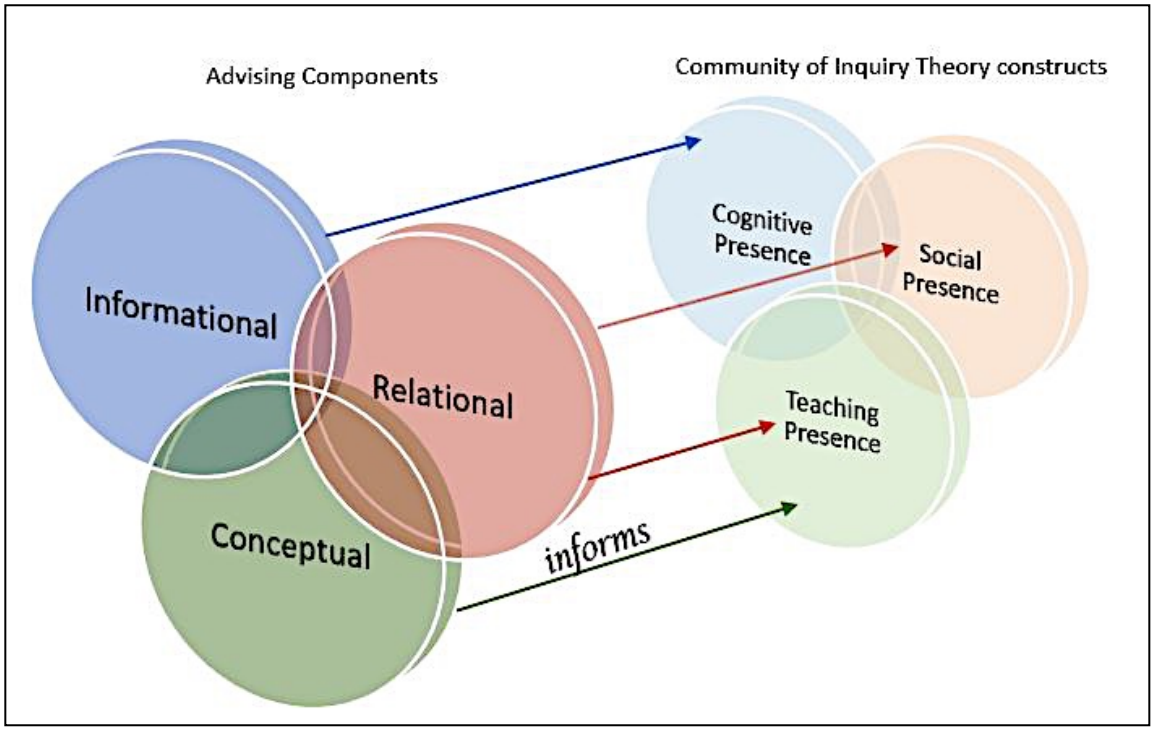


Figure 3 illustrates the three academic advising components (left) and their proposed alignment with the three elements of the COI framework (right). The arrows align the advising components with the COI elements as an additional way of understanding their compatibility;

they do not suggest a linear relationship. As suggested by Table 2, the informational advising component aligns directly with the cognitive presence element of COI. Next, the conceptual advising component informs the teaching presence element of COI (refer to Table 3). Finally, the relational advising component aligns with two COI elements: teacher presence (Table 4) and social presence (Table 5).

In their work with new advisors, Folsom, Joslin, and Yoder (2005) suggested a new advising component called *personal competencies*, which included understanding, care, and development of self. Higginson (2000) explained personal competencies as advisor self-knowledge and included it in the academic advisor informational component. However, McClellan (2007) critiqued Higginson's (2000) decision and argued that advisor self-knowledge is not all informational, and certainly is not completely shared with students. Mahoney (2009) expanded the definition of advisor *personal competencies*, which flows across advising disciplines and careers, and develop through education and work experience. These advisor personal competencies include: inquiry and analysis, critical and creative thinking, written and oral communication, quantitative literacy, teamwork and problem solving, and intercultural knowledge and competence.

Lastly, McClellan (2007) added the fifth element, the academic advisor technology component, after reviewing Higginson's (2000) list, which placed training on applicable advising technology in the informational and relational components. McClellen's (2007) explained that technology is not just informational or relational, but a challenge of competent functioning. He argued that while advisors used a particular technology to enhance student interaction or learning, the advisor's utilization of technology (skill and use) was between advisor and computer, not advisor and student.

To summarize, the academic advising profession section included a brief overview of the history, development of the profession, and advising approaches. Advising approaches included: prescriptive, proactive, developmental, appreciative, and strengths-based. The changed perspective from one correct advising approach to multiple approaches across a continuum, is a critical paradigm shift. The needs of the students, and the advisor's skills and limitations are variables that shape advising practice and interaction. An overview of the advising-counseling continuum (Kuhn et al., 2006) and the advising as teaching concept was discussed. The scant research on the continuum and advising approaches were reviewed. Habley's (1986) three academic advising components (informational, conceptual, and relational) and their competencies were aligned with the three core elements of the COI theoretical framework (Garrison et al., 1999): teaching presence, social presence, and cognitive presence. More recent competency discussions included personal competencies (Folsom, Joslin, & Yoder, 2005) and technology (McClellen, 2007). Finally, Tables 2 - 5 organized specific skill/responsibilities tying a COI element with an advisor component. These tables built the foundation for Figure 3, which illustrated the holistic alignment of advising components and COI elements. In other words, this section analyzed the multiple and overlapping connections between the COI theoretical framework and academic advising.

Technology and Communication: Distance Education and Online

The technology and communication section includes a brief history of distance education and online research specific to academic advising. National studies show little contact with advisors, so advisor preferred communication methods were compared with student communication preferences, both for undergraduate and graduate students. Steele's (2016) intentional use of technology model is also reviewed. Before introducing the various advances

in technology that provide innovative ways for higher education to interact with their online students, one needs to appreciate the historical context of how online and distance education advising research started roughly 30 years ago.

Although the study of academic advising on-campus has decades of history, distance-learning research for adult student advising originated in 1987 in the United States (Beitz, 1987; Gordon & Habley, 2000; Polson & Others, 1986). In 1987, academic advising relied on phone calls to communicate with distance education students (Beitz, 1987; Curry, Baldwin, & Sharpe, 1998). Studies of academic advising and online students were not published until 1993 (Curry et al., 1998; Fornshell, 1993).

In Curry, Baldwin, and Sharpe's (1998) survey of academic advising for distance education, the schools invited to participate had to meet two criteria (1) offer a baccalaureate degree online and (2) have a main campus located in the United States. Eighty-nine schools qualified under the criteria and 82% of those invited responded to the survey. Findings revealed telephone conversations were the most popular form of communication.

In 2002, the NACADA National Survey on Technology in Academic Advising found advisors preferred email for communication (Leonard, 2004). Email remains the primary communication method for professional academic advisors and faculty across higher education institutions (NACADA, 2011; Pasquini, 2011). The latest NACADA National Survey on Technology in Academic Advising in 2013 also found asynchronous email (98.9% reported daily email use) the number one technology used by academic advisors and support staff (Pasquini & Steele, 2016).

Academic advising for online students, in the initial reaction to exponential growth in online enrollments, seems to have reverted to prescriptive methods (Steele & Thurmond, 2009).

The prescriptive method includes a website link to a program plan and email alerts for registration deadlines (Steele & Thurmond, 2009). The online student seeks out an advisor during their advisor's business hours, via traditional methods of phone or email, to communicate any further concerns or desires, but unlike on-campus students they have the added challenge of not being physically present (Beitz, 1987). Steele and Thurmond's (2009) research findings suggested that this prescriptive approach of "providing online versions of paper resources" did not improve student outcomes (p.85). National standards in academic advising for online programs were published to combat this trend, however recent national studies still report findings that are concerning (NACADA, 2010).

Little contact with academic advisor. The National Survey of Student Engagement (NSSE) was administered from the Center for Postsecondary Research in Indiana University's School of Education. The fee structure for participating institutions was based on undergraduate enrollments for that year. In 2005, the NSSE reported 12% of freshmen students did not meet with an academic advisor (N = 285,000 from 546 institutions). Unfortunately, the 2014 annual results of the NSSE found only one in three first-year students met with an advisor during the year. According to NSSE (2014), a stunning 66% of freshman not meeting with their advisor was worrisome due to:

> The number of times students met with academic advisors in the first year of college was positively related to their perceptions of a supportive campus environment. First-year students who met more often with an academic advisor reported a stronger institutional emphasis on academic, social, and personal support through program offerings, social opportunities, diverse interactions, campus activities and events, as well as support for health and wellness. Further, the positive link between the number of advising meetings

> and perceptions of support was consistent across racial/ethnic groups, which suggests that academic advisors help all student groups become more acclimated to the campus environment (p.13).

The 2014 NSSE also identified that lack of contact with an academic advisor is a critical issue for both student support and retention, and stated students needed special proactive efforts in the first-year adjustment period. The 2016 NSSE (N = 300,000 from 512 institutions) offered an additional academic advising module, separately purchased from the traditional survey. Many institutions (n = 172) included the academic advising module and found that 9% of freshman had no discussions, while 22% of freshman had only one discussion with their academic advisors on academic interests, course selections, or academic performance (NSSE, 2016). Also, the 2016 NSSE Technology academic advising module reported 15% of freshman *never used* technology to contact their advisor, 36% reported *some use* of technology, 37% *often used* technology, and 22% *very often* used technology to contact their advisor. Unfortunately, there was no delineation between online and main campus students in the NSSE findings (2005, 2014, 2016).

Communication methods versus student preference. The 2011 National Technology in Use survey from NACADA (N = 770) revealed that email remains the primary communication method for professional academic advisors and faculty across higher education institutions (Pasquini, 2011). Although participating institutions ranged across the Carnegie Classification spectrum, the largest category was two-year schools (n = 239), followed by public doctoral institutions (n = 127). Institution size ranged from small (n = 425), medium (n = 258), and large (n = 84), with only 0.9% of advisors solely focused on online students (n = 7). The study found only 29.4% of schools used a website or portal, and just 5.5% used video conferencing for communicating with students (Pasquini, 2011). Since email remains the dominant

communication tool, the next logical step is questioning the student perspective of email (Noonan & Stapley, 2015; Pasquini & Steele, 2016).

Undergraduate student communication preferences. Noonan & Stapley (2015) found students use email to ask specific simple questions, make a request, or to set up appointments. They found undergraduate students (*N*=200, interviews and questionnaires) prefer not to have complex, advising conversations via email, so how the students were seeking guidance remained unknown (Noonan & Stapley, 2015). A diverse sample of students showed a preference for face-to-face meetings with academic advisors. For example, Gaines (2014) survey results suggested that undergraduate students at a public university in the south, with an adult student population (49.5% were 25 or older) who were mostly online (72.8%), preferred face-to-face meetings (*N* = 116, 20.9% survey response rate, +/- 7% accuracy at p = .05., Cronbach's alpha = 0.511). Noonan & Stapley (2015) identified this same preference for face-to-face meetings at a private metropolitan university in the north. These undergraduate studies supported students' continued preference for personal interaction with their academic advisor, regardless of whether they were commuting to campus, residing on campus, or taking online courses (Gaines, 2014; Nichols, 2010; Noonan & Stapley, 2015).

Graduate student communication preferences. In their research, Schroeder and Terras (2015) focused on advising experiences of graduate students and used a phenomenological methodology. They studied graduate students in three learning environments: online, cohort, and face-to-face courses (*N* = 9, three per group, with 80% of coursework in one environment). Schroeder & Terras found that despite graduate student preference of learning environment, advising needs are complex and holistic. Schroeder & Terras (2015) urged further exploration into the students learning environments and reported differences with "programmatic guidance

and conceptualization of immediacy in response time" (p. 51). Additionally, they recommended that new advising systems be tested to meet the adult student's needs.

In conclusion, throughout the studies reported across various demographic groups, students have a preference for face-to-face meetings with academic advisors (Gaines, 2014; Noonan & Stapley, 2015; Schroeder & Terras, 2015). The disconnect between advisor preference for email and the student's preference for face-to-face meetings is a concern, not only for the practitioner in the field but of national interest. The results of this division have consistently appeared in national survey data (Leonard, 2004, NACADA, 2011; NSSE, 2005, 2014, 2016; Pasquini, 2011). The national dialogue on the lack of contact, and student preference for a better connection beyond email, helped to increase inquiries into other approaches. Emerging technologies offered a way to connect the need for personal interaction with geographically separated students (Johnson, Adams, Becker, Estrada, & Freeman, 2014).

Setting the foundation for intentional use of technology. Future research recommendations included inquiries into better online approaches to academic advising online students (Brigham, 2001; Britto & Rush, 2013; Curry et al., 1998; Pasquini, 2011). The technology existed in the faculty/classroom environment to support proactive academic advising for online students (Waldner, McDaniel, & Widener, 2011). Unfortunately, many researchers struggled to build a framework on how to offer online student services (Brigham, 2001; Hardy & Meyer-Griffith, 2012), online academic advising practice (Dunn, 2005; Kendall, 2005; Steele & Thurmond, 2009; Ullmann, 2009), and faculty advising (Ludwig-Hardman & Dunlap, 2003; Waldner et al., 2011). Between 2010 and 2011, 12 studies were covered in an annotated, focusing on research topics related to academic advising (Carduner & Mottarella, 2012). Not one of the studies addressed online academic advising (Carduner & Mottarella, 2012).

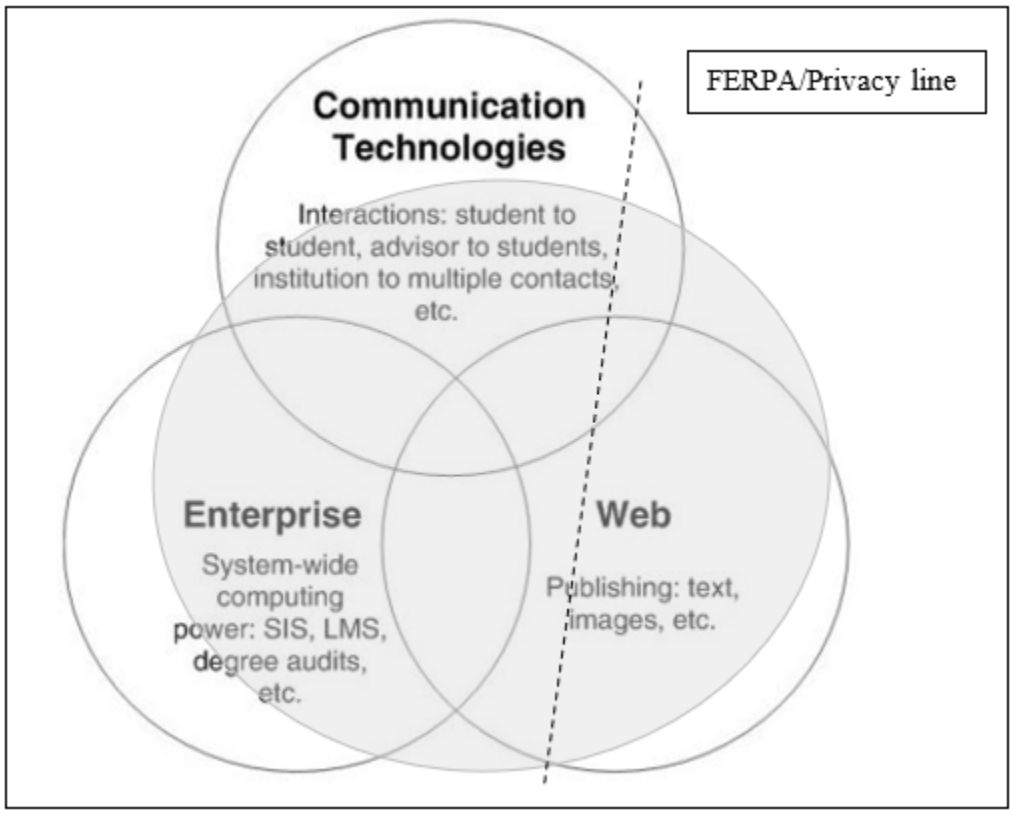
George E. Steele (2014), curator of the NACADA Clearinghouse, conducted a qualitative study using 25 years of NACADA annual conference proceedings to examine the intentional use of technology in academic advising. The technology sessions were coded and sorted into three groups: communications technology, web-based, and enterprise systems. Refer to Figure 4 for an illustration of Steele's (2014) intentional technology use model. The United States Family Education Rights and Privacy Act (FERPA) of 1974 protect a student's rights to privacy and was included in the model. Steele's (2014) first technology category, communication technologies, focuses on interactions between all parties (advisor - student, institution - student, or student - student). These technologies are mostly considered FERPA compliant with the use of student logins for account access. Public tools, such as open forum chat sessions are not compliant.

The second technology category, web-based, includes web sites and a mix of media formats (images, text, video, sound) with open public access that provide information. These technologies did not require a secure login, and therefore were not FERPA compliant. Last, enterprise systems, are institutional computing systems for the institution and students. Examples of enterprise systems include learning management systems, and student registration portals, which are considered FERPA compliant as they require a login.

As shown in Figure 4, these three technology categories overlap in the center. Steele (2014) included a solid circle in the background of the triad model, which represents the few technology sessions that did not fit into the three categories. A dotted line represents the FERPA line, with compliant technologies on the left and noncompliant on the right. Steele cautioned that advisors must be informed about how technology was used successfully in the learning/teaching process, to improve virtual student services to our online students.

Figure 4

Intentional Use of Technology Model

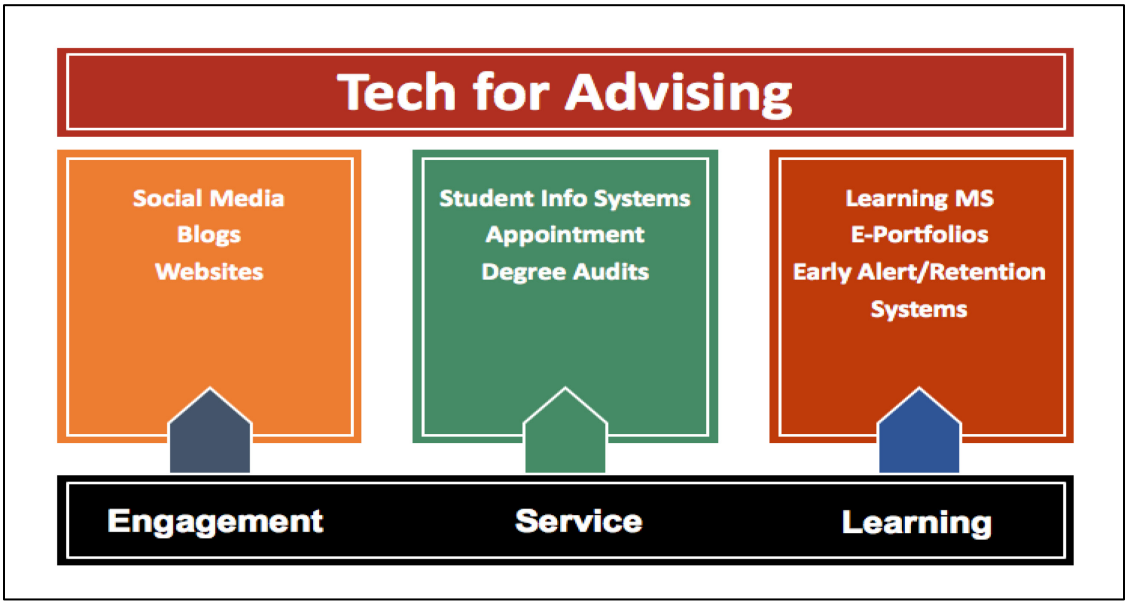


Note. Appendix F includes George Steele's approval for the use of this image. Adapted from Steele, G. E. (2014). Intentional use of technology for academic advising. *NACADA clearinghouse for academic advising resource* [website]. Retrieved from http://www.nacada.ksu.edu/Resources/Clearinghouse/View-Articles/Intentional-use-of-technology-for-academic-advising.aspx

After several technology tools were categorized in Steele's (2014) analysis of technology conference sessions, he focused on how others utilized these tools individually or in combination. The NACADA conference presentations, focused on technology and academic advising from 1988-2012, found there are three areas of purposeful utilization of technology to support advising goals (Steele, 2014). Those three purpose areas are learning, engagement, and service (Steele, 2014). Figure 5 illustrates technology options in Steele's model by purpose.

Figure 5

Technology for advising



Note: Appendix F includes George Steele's approval for the use of this image. Adapted from Steele, G. (2016c). Don't pass on iPASS: Recalibrate it for teaching and learning. *NACADA Clearinghouse of Academic Advising Resources.* Retrieved from https://www.nacada.ksu.edu/Resources/Clearinghouse/View-Articles/Dont-Pass-on-iPASS-Re-Calibrate-it-for-Teaching-and-Learning-a6416.aspx

According to Steele (2014), customer service is only one aspect of the practice of service. Academic advising provides a way to engage students in understanding how technology systems provide greater access to resources and information. It is incumbent of an advisor to teach students how to navigate systems successfully when a student does not understand the relationship between the technology tools or the higher education systems in place. Steele (2014) added that assessment of learning should take place, which reaches beyond the concept of customer service, as "customers are not held to this level of accountability" (para. 13). It is important to connect the COI framework and Steele's (2014) intentional use of technology model for this research.

COI was conceptualized for the online education environment embedded within a learning management system (LMS). Steele's (2014) model expands the use of technology for education across many individual tools, while another choice offered a combination of tools. This expansion allows for multiple technology tools to purposefully serve student's needs.

Due to the dearth of online academic advising literature on the intentional use of technology, it is necessary to expand the search to the online classroom. Online classroom research is strongly influenced by the evolution in technology from asynchronous to synchronous. As academic advising communications, in Steele's intentional use of technology model, are encouraged to expand beyond asynchronous email. Research from the online environment may provide insight as to why the expansion was recommended.

Online – asynchronous. This section introduces initial research comparing various asynchronous technologies, while emerging technologies such as video conferencing are compared with text based dialogue tools in learning management systems, Facebook and Twitter, or email and phone (Frisby, Kauffman, & Beck, 2016; Haberstroh, 2009; Ladyshewsky & Pettapiece, 2015; Lundy & Drouin, 2016; Skylar, 2009; Snoddy, 2007). According to Richardson, Fox, and Lehman (2012), asynchronous classrooms dominate online distance education. Teo et al. (2015) define asynchronous technologies as supporting a difference in time and place for learning. Email, instant messaging, and discussion boards are all considered asynchronous technologies.

In Lundy and Drouin's (2016) study of undergraduate students ($N = 165$), instant messaging (IM) was found to be beneficial to socially anxious students' interpersonal connectedness. The benefits are due to the anonymous nature of having no cameras and the time delay between posts allowing time for reflection on responses. Participants were enrolled in

introductory Psychology classes and received research credit for participation (ages 18-57, 79% white, $n = 117$, majority females). A repeated measures survey, the intropersonal attraction and homophily survey, was given before and after participatants had to interact with an assigned partner via face-to-face, skype (voice) or instant messaging. According to Lundy & Drouin (2016), IM ranked higher in student connectedness than both face-to-face and phone calls with socially anxious students.

Contrarily, Snoddy's (2007) research showed different results. Using a survey, the study was conducted with associate degree students enrolled in two courses, and each course had two sections for a control and experimental group ($N = 112$). Snoddy (2007) concluded that instant messenger made no significant difference in student retention, achievement, or satisfaction of students. In a report concerning the implementation of virtual career counseling and advising program, Haberstroh (2009) found that the chat tool functioned for simple questions and abbreviated discussions, rather than conversational dialogue. Additionally, Haberstroh's (2009) study found that the inability to form relationships with students made online advising through the chat system difficult at best. These findings further support Steele's (2014) call for expanding the intentional use of technology in academic advising beyond asynchronous email, the most popular communication method reported by academic advisors (Noonan & Stapley, 2015; Pasquini & Steele, 2016).

Online classroom research was strongly impacted by the introduction of synchronous tools. The following section includes an overview of the research comparing asynchronous and synchronous technologies. As academic advising research was meager in this area (Noonan & Stapley, 2015), the online environment research provided further insights into online students and their perceptions of both technologies.

Asynchronous vs. synchronous comparisons. Skylar (2009) compared asynchronous versus synchronous lecture technologies in two online sections. The experimental design alternated the lecture methods (synchronous and asynchronous) every other week. The majority of participants (n = 44) reported that synchronous web conferencing increased their understanding of content (87.6%) and they scored better on weekly quizzes (80.5%). No significant difference was found in effectiveness overall for either lecture format, suggesting both are equally effective. However, the added interactivity of pausing for yes/no polling or open-ended questions every 10 minutes in the synchronous web conferencing lectures resulted in higher satisfaction. An additional value to the use of web conferencing was the reported improvement in technology skills by the students. Unfortunately, the use of online in the title and article was misleading. The limitation section revealed that both sections were actually of a hybrid format, where the beginning and end of both classes met on campus face-to-face. Face-to-face students in a campus class expect high amounts of interaction and cross-checking for content understanding, similar to the design and implementation of web conferencing lectures (Skylar, 2009).

Berglund (2009) focused on participation rates and dialogue feedback strategies in language learning through FlashMeeting video conferencing. Unlike Skylar's (2009) instructor testing for comprehension every ten minutes, Berglund's experimental design analyzed previous recordings of student discussions in spring 2006, and there was no teacher present. Instead, questions for discussion were published before the video conferencing to allow students time to gather information to support their answers. Unfortunately, the students prepared statements to answer the published discussions, which resulted in a monolog lecture, instead of a dialogue conversation during the video conferencing. According to Berglund (2009), before five sessions,

a student was trained and tested in the conferencing environment on the use of the different features, including the raising of a hand, and chat. Participants included Swedish native speakers (n = 5 for sessions 1-4, n = 4 for session 5), two of which had lived in the UK and USA, and two other participants who were described as technically advanced. Unique to this study, Berglund acted as a silent witness to record (with no outgoing video or audio) the computer screen to capture the student's full conferencing experience, as sessions recorded within the FlashMeeting environment did not capture the thumbnail video images. Two factors impacted participation rates: language proficiency and prior online communication experience. Personal speaking styles, task, and tool design were also suggested to influence participation.

Frisby, Kaufmann, and Beck (2016) used qualitative (repeated measures survey) and quantitative methods (two randomly chosen essays from mid-term and end of course) to study task accomplishment and relational development in an online undergraduate course (N = 25, one did not give consent and seven did not complete, 19-30 years of age, 89.3% white). Although the change between pretest and posttest was not significant, "descriptively, those students in the video chatting condition had the most positive outcomes" with improvements in all eight scored categories: cohesion, satisfaction, motivation, group hate, affect of instructor, affect toward content, effect on enrollment of similar course, and cognitive learning (p.223). Of interest, Facebook only increased scores in cohesion and satisfaction on the posttest. Twitter reported increased scores in satisfaction, motivation, affect toward content, the effect in enrollment of similar course, and cognitive learning. Although findings were not statistically significant, Frisby et al. (2016) descriptive findings indicated that student perception of CMC tools enhanced their relational connections. Furthermore, richer CMC mediums, such as video conferencing, were reported by students to be more effective and easier, and all three CMC tools (Skype,

Twitter, and Facebook) specifically aided the forming and norming phases of relational development in their groups. A possible limitation was that the face-to-face interpersonal relations class required students to use computer mediated communication outside of the classroom contact hours. This may have impacted their awareness of relational affects and allowed for additional face-to-face communications in class. The small sample size ($N = 26$) was also a limitation.

Ladyshewsky and Pettapiece (2015) questioned the assumption that students who were successful online and used email, social media, and web conferencing technologies for personal engagement, proved to be effective leading virtual teams or virtual coaching. A purposeful sample of convenience included (49 students in two sections of online business classes) participants ($N = 22$) who turned in three learning journals on their peer coaching experiences (as a coach, and the one coached). Virtual peer coaching teams were formed and told to use an information communication technology (ICT) of their choice, although students used email, chat, Blackboard Collaborate in class, and had class resource information on Skype and MSN Messenger (Ladyshewsky & Pettapiece, 2015). Two themes emerged: (1) the technology selected impacted use and experience, and (2) previous experience and opinions impacted communication and technology choice. Ladyshewsky and Pettapiece found email was not a rich coaching environment, and students preferred to use this technology for introductions, file sharing, scheduling, and exchanging information. However, email had a formal tone, did not encourage more than surface level relationship building, and had a potential for miscommunication. Telephone calls provided verbal cues, however, it hampered non-verbal communication and was found not to build rapport between coach and coachee. In the findings, Skype without video was like telephoning, however using video greatly enhanced rapport

building and provided both verbal and non-verbal cues. The management of discourse and silence was found to be a skill challenge. Blackboard Collaborate, a web conferencing platform, unfortunately, had many technical difficulties for the participants in this study and was found to be ineffective. Overall, Ladyshewsky and Pattapiece concluded integration of media "may be the most appropriate strategy" for building successful virtual peer counseling, as evidenced by student migration towards the more media rich communication technologies, despite limited skill and frustrations with technology.

In conclusion, the added interactivity of synchronous web conferencing resulted in higher satisfaction (Skyler, 2009) and the richer medium was deemed by students as more effective and easier (Frisby et al., 2016). Table 6 summarized the reviewed research. Participation varied with language proficiency, prior experience with the technology, and anxious public-speaking students (Berglund, 2009; Frisby et al., 2016; Ladyshewsky & Pettapiece, 2015).

Table 6

Summary of asynchronous compared to synchronous conferencing

Author (year), participants	Asynchronous	Synchronous
Skylar (2009) $N = 44$, hybrid	As effective in lecture as synchronous	Interactivity = higher satisfaction
Burglund (2009), $N = 5$	Multimodal interactions	Higher scores with either prior experience or language
Frisby et al., (2016), $N = 28$	Tweet improved in five categories, Facebook improved in two categories	Skype improved in eight categories
Ladyshewsky & Pettapiece (2015), $N = 22$	Email formal.	Phone lacked nonverbal cues. Video enhance rapport, verbal and non-verbal cues

Frisby et al. (2016), in a possible connection to the relational advising component and the COI framework, found that relational communication facilitators were higher than barriers. Web conferencing had improvements with all eight categories, while Twitter increased in five categories, and Facebook in two (Frisby et al., 2016). Ladyshewsky and Pettapiece (2015) found that using web conferencing greatly enhanced rapport and provided both verbal and non-verbal cues. Although the COI theoretical framework was conceptualized using asynchronous technology, the evolution of synchronous technologies expands the possibilities of future research (Garrison & Arbaugh, 2007). These findings support Steele's (2014) call for the intentional use of alternate technologies in academic advising, to include synchronous tools. Recent changes in access to technology, stronger signal strengths, and multiple devices in the hands of students provides the foundation for considering web conferencing a viable option for advising online students, despite lingering challenges. All of which will be discussed in the next section.

Online communications – synchronous. Recently there is more emphasis on new synchronous technology. Teo et al. (2015) define synchronous technologies as supporting the same time and place for learning. Burke (2016) states synchronous collaborative tools allow users to interact, build community, and strengthen collaboration. Web conferencing was a synchronous tool. Only since 2011 has the prevalence of online audiovisual communication and its usage increased; first, due to the integration of webcams into desktops, laptops, and other devices (e.g., smartphones, tablets) and second, the advent of low-cost or free technology (Abrams et al., 2015). As a *reasonable alternative**,*** web conferencing could connect advisors with their geographically isolated online students (Frisby et al., 2016; Gaines, 2014; Gordon &

Hably, 2000). However, advisors rarely use video-teleconferencing (5.5%) as the use of email (99%) continues as the primary communication tool (Pasquini, 2011).

Pasquini and Steele (2016) analyzed the 2013 NACADA Technology in Advising survey results ($N = 990$, 21% were 22-29 years, 31% were 30-39 years, 24% were 40-49 years old, 78% female, representing all Carnegie institutional types) and found that video conferencing use increased slightly from 2011. The 2013 survey results found 1.88% used video conferencing *once a day*, 7.16% used *once per week*, 14.32% used *per month*, 11.06% *per semester*, and 4.77% *per year*, while the remaining 60.80% reported *never* using a video conferencing tool. According to Pasquini and Steele (2016), use of technology for video conferencing by advisors seems to align with institutional encouragement. Pasquini and Steele (2016) report 38.94% *strongly agreed* or *agreed* that their institution actively encouraged the use of video conferencing, while 61.06% *disagreed* or *strongly disagreed* with a strong institutional emphasis on video conferencing use (Pasquini & Steele, 2016). Unfortunately, the historical NACADA survey demographic questions remained the same, while a few updated survey questions involved only a few technology tools removed, as they were no longer in use (palm pilots for example). The NACADA 2013 survey did not (a) ask advisors whom they served (online, face-to-face or a mix of students), (b) ask what tools they lacked access to, or (c) update the video conferencing term to web conferencing, or define video conferencing. In short, the latest NACADA Technology in Academic Advising survey completed in 2013 remained focused on questions that asked only about usage, without providing additional context such as access or student population served. Many of the results require further exploration, as 78.75% reported *never* using a customer relationship management program in the last year, while 37.6% *never* used a learning management system (ie. Blackboard, Canvas). It remains unknown of how many

of the 990 respondents (8.67% response rate) worked at an institution with these technology systems, or offered online programs. Pasquini (2011) addressed leadership and institutional considerations and assessment of appropriate technology and implementation of a strategic technology plan.

In summary, the technology and communication in distance education and online section included a brief history. National studies showed student self-reported limited connection with long term support (NSSE, 2005, 2013, 2014, 2016). For more than a decade, advisors in national studies reported a strong preference for using email as their primary communication tool with online and other students, despite the development of other communication tools (Leonard 2004, NACADA, 2011; Pasquini, 2011; Pasquini & Steele, 2016). Unfortunately, across various demographic groups, online students have continued to prefer face-to-face meetings. Emerging technologies and the communication gap between practice and preference reached national recognition with a discussion among members of the 2014 Higher Education Expert Panel. They indicated the advent of voice and video tools were not only increasing the number of interactive activities between online instructors and students but also greatly improved the interaction quality (Johnson et al., 2014). For a review of web conferencing platforms as an alternative method to email, criteria included providing an online student the opportunity to engage in one-on-one, face-to-face interactions, and using technology (Gaines, 2014). Steele & Thurmond (2009) suggested that web-conferencing would elevate the academic advising exchanges by providing discussion with visual information. Additionally, they suggested that advisor/advisee discussions utilizing web-conferencing could include where to find and how to use the web or portal tools. More importantly, the advisor could ask probing questions on how the information

reviewed interactively between student and advisor could be of assistance to the student (Johnson et al., 2014; Steele & Thurmond, 2009).

Steele's (2014) model for intentional use of technology for academic advising was introduced, which encompassed many institutional systems accessible across a campus, to include online student services. Technologies were grouped into three types: communication, web, and enterprise. The purpose of each of the 10 individual tools revealed three purposeful uses: learning, engagement, or service. Finally, a research review in the online environment revealed the challenges of asynchronous communications by comparing asynchronous to emerging synchronous communication tools. This review provided a necessary background on how online students perceive the change from asynchronous to synchronous tools, as there is meager research in the academic advising literature on this topic. As a preference for synchronous tools was revealed, further research is recommended (Frisby et al., 2016; Ladyshewsky & Pettapiece, 2015; Steele, 2014).

Conferencing with Evolving Technology and Terms

Starting in the mid-1990's in distance education and online learning literature, multiple definitions of the phrase *conferencing* emerged with technology. At the 35th Annual Adult Education Research Conference, Eastmond's (1995) term *computer conferencing* was defined as asynchronous communication through a discussion board. Brade's (2007) literature review on video conferencing and learning and teaching from 2000 - 2007 noted that activity on interactive video conferencing started in 1997. In Brade's (2007) literature review of 25 references, interactive *video conferencing* involved multi-site screen-based video conferencing classrooms, where class timetables are synced across campuses and materials are sent via email, CD-ROM, or student online portal. Although many of the studies from this period reported enhanced

interactions, limitations included the cost of equipment, and audio and display quality (Brade, 2007). Also, technical competencies and training were cited as weaknesses (Brade, 2007).

The term *web-conferencing* appeared in literature in 2004 (Bower & Hedburg, 2009). *Webinar* was a hybrid word combined from web and seminar and was a new word in the Merriam-Webster Dictionary in 2008. In Bower and Hedberg's (2009) search in ERIC for *web-conferencing*, 31 articles appeared across all fields. Unfortunately, all but four used the term to "refer to generic online collaboration (for instance using discussion boards) or only tangentially referring to full fledge web conferencing systems" (Bower & Hedburg, 2009, p. 462). He (2012) utilized live video streaming (LVS) to describe the institution's interface capabilities and the environment. A question window within the conferencing software allowed students to ask the teacher questions, and the chat window with the same software allowed students to interact with each other. However, the teacher only responded to queries via live audio feedback, as there was no video used, which was a design limitation in the interface (He, 2012). Additional studies claimed the use of a web-conferencing technology in their research, but did not use video capabilities (Chen, 2016; Kear et al., 2012)

The current evolution of technology in web conferencing includes two-way conferencing (video and audio), the ability to telephon e into the meeting, and presentation tools such as a whiteboard, document sharing, and screen sharing capabilities (Fabregas-Ruesgae, Hernandez-Abad, Hernandez-Abad, & Rojas-Sola, 2015; Mavridis, Tsiatsia & Tegos, 2011; Twine, Brown, 2011). Interactive tools include the chat window (student may select another student, the teacher or the class as the recipient), and anonymous polling options (yes/no, true/false, multiple choice) which increases the instructor's grasp of student understanding (Mavridis et al., 2011). Additionally, students can alert the presenter to stop for questions through the use of a visual flag

called the raised hand tool (Mavridis et al., 2011). Bower and Hedberg (2009) use the phrase *multimodal collaboration* to describe how conferencing and interactive tools encourage co-construction of knowledge. Some conferencing environments could also be manipulated to include the presenter as the largest video square or show other participants in a "Brady Bunch" like pattern of three squares across by three squares down. Smaller group breakout rooms, shared files, and recording are also part of the newest web conferencing technology (Wdowik, 2014). Although Wdowik (2014) used the phrase *online synchronous learning environment* (OSLE), the definition mostly matched Mavridis, Tsiatsia, and Tego's (2011) description of web conferencing. However, Wdowik (2014) adds that the text, audio, and visual connections are supported by voice over internet protocol (VOIP).

In conclusion, a lack of standardized terminology and the rapid evolution of technology presented a challenge to finding literature. The term *conferencing* was selected as a search term for this reason. Mavridis et al. (2011) definition of web conferencing was used for this research study.

Search criteria, selection and exclusion steps. Separate searches were conducted in EBSCO (refer to Appendix G for a list of subject databases searched), ProQuest (all databases), and SAGE (all databases) with separate searches for "online learning" and "distance education." Search terms with the Boolean operators included: conferencing and ("online learning" OR "distance education") and "higher education." Appendix H presents the search criteria, selection and exclusion strategies, and the results of each following review. Overall, the Boolean search resulted in 1704 articles, but only 36 (2.1%) were retained. Several themes emerged in the literature review, including comparisons between asynchronous and synchronous tools (refer to Table 7), technical knowledge and competencies, comparisons of synchronous tools to face-to-

face with a subsection on generational preferences, and finally social presence a COI element. Technical knowledge and competency were tied to teaching presence, furthering the connection to the COI theoretical framework. Asynchronous tools (refer to Table 6) interrupted the natural ebb and flow of communication, possibly disrupting the development of community (Stover & Miura, 2015). Burke (2016) stated synchronous collaborative themes allowed users to interact, build community, and strengthen collaboration. As these themes are strongly intertwined in both the COI framework and academic advising practice, a review of the literature concerning web conferencing as a synchronous collaborative tool in advising was appropriate.

There is a deficiency of research on web conferencing in academic advising, and no advising articles were identified in the Boolean search. Once again, literature from other areas in higher education research was necessary to provide insight into this research field. Much of the research found in the online environment involved the classroom, and initial emerging research with the advent of web conferencing included technical competencies.

Technical knowledge and competencies. Bower (2011) analyzed how web-conferencing affects student learning, resulting in the creation of the first categorization of web conferencing competencies. Twenty students completed ($N = 26$ at start) an introductory computer programming course offered in three separate semesters from 2005 to 2006 ($N_{male} = 17$, $N_{female} = 9$). Collaboration competencies divide into four main categories: operational, interactional, managerial, and design. First, operational competencies only require practice in the environment to gain experience and form the foundation for the other three categories. Interactive competence requires tool use to collaborate, receive/transmit, and co-create. Management competence (similar to classroom management) requires the ability to convey the task and objectives and troubleshoot. Finally, design competency allows for creative and

innovative pedagogy and strategies to achieve the desired objective. A person's level of competency directly relates to the degree of interactivity one designed into the experience.

Another strength of Bower's (2011) article is the connection made between the layers of web-conferencing tools and their support of specific teaching perspectives. The first course was limited to a transmission perspective where neither the teacher nor the students were familiar with the environment. The goal was to simply transmit the content from the teacher to the students as an audience (Bower, 2011). This was supported by Pratt's (1998) transmission description where the instructor and step-by-step content takes priority. Student-centered pedagogies, which occur once the instructor is competent, requires an increase in design capabilities and management competencies (Bower, 2011). Engaging the student with collaborative tools allowed the practice of skills, or as Pratt (1998) explained the apprenticeship perspective "learning in situations of application" (p.87).

Renold et al. (2012) used a monthly faculty ($N = 10$, online class experience ranged from 6-15 years with $M = 10$) meeting to collect self-report survey data to provide information on effectively using video conferencing for online higher education use. The survey results for 10 open-ended questions (based on Netiquette rules by Shea, 2005) were analyzed and reported back to the faculty participants. Faculty discussed the findings and collaborated on the VC Guidelines (Renold et al., 2012). Proactive approaches to incorporate and orient students to conferencing technology are paramount, as many students used similar technology for non-academic purposes, such as social communication with family and friends (Renold et al., 2012).

Established Video Conferencing Guidelines include:

1. Remember you are on camera and live;
2. Adhere to the same standards of behavior during the video conferencing session that you would follow in real life;
3. Be mindful of all video conferencing participants;
4. Video conferencing provides synchronous opportunities to share knowledge;
5. Be mindful of your tone and expressions during the video conferencing sessions;
6. Share your expertise and knowledge;
7. Remain professional in your communication with participants.

These web conferencing guidelines are important to address in professional development training with academic advisors, as institutions provide access to web conferencing technology to serve students beyond the classroom. Lessons learned in the rollout of these emerging technologies could be adapted and included by advising programs in their strategic plans for the intentional use of technology (Steele, 2014). In addition to gaining technical competence, it is important to assess a variety of new synchronous tools in the online environment. Current research seeks to determine the impact of synchronous technology in the online environment.

Web conferencing, a synchronous technology online. Web conferencing has been studied using two major themes. The first theme includes research that compared two synchronous environments: face-to-face versus web conferencing. The second theme includes research that focused on generational attitudes and preferences on the use of web conferencing technology and technology use in general. The second section on generational preferences in technology also includes a current discussion in the field on the aging paradigm of digital natives/ digital immigrants (Prensky, 2001) versus visitor/resident modes, which explains

engagement motivation (White & Le Cornu, 2011). Research supports the visitor/resident mode classifications (Vosner, 2016; Yuan, Hussain, Hales, & Cotton, 2016). These two web conferencing themes are organized by separate subsections in this literature review, starting with the comparison of synchronous face-to-face versus synchronous online.

Synchronous face-to-face versus synchronous online. Synchronous face-to-face comparisons to synchronous online technology, specifically the use of web conferencing, revealed that dialog complexity, learning experiences, and grades were found to be equal (Abrams et al., 2015; Englehart, 2015; Fabregas-Ruesgae et al., 2015). Also, web conferencing tutoring was found to be as effective as face-to-face tutoring on short term retention, as measured by completion of the course (Rennar-Potacco et al., 2016).

Abrams, Wang, Song, and Galindo-Gonzalez (2015) found that video conferencing and face-to-face dialog were equal in complexity and depth, which further supports the binding of the participants through social presence within the video conferencing culture. The quality and depth of these social interactions are critical, as research conducted over decades revealed that interaction is a key factor in student success. Abrams et al. (2015) did not account for operational competency in their study, specifically communication checks, which was standard practice in other video conferencing research designs (Bower, 2011; Greenhalgh et al., 2016; Stewart & Williams, 2015). This unfortunate oversight most likely impacted Abrams et al. (2015) findings, that although the depth of dialogue between face-to-face and video conferencing is equal, the time on the topic was not equal.

Fabregas-Ruesgae et al. (2015) compared university learning experiences between face-to-face and distance. A post-class survey inventory of 29 items (seven-point scale, $n = 38$) and one open-ended question ($n = 30$) assessed the platforms (web conferencing and VLE), learning

management system, and platform resource usefulness and operation. Results for the online classes were higher than face-to-face students with 86.8% reporting *good*, *quite good* or *very good* (73.7% face-to-face), with an additional 7.9% remaining *neutral* (22% face-to-face). Even with the use and function challenges with web conferencing, grades were not found to be significantly different between online and on campus (Fabregas-Ruesgae et al., 2015).

Englehart's (2015) study also used Adobe Connect for comparing online student synchronous web conferencing versus two small regional distance campuses' connecting via web conferencing for classes due to enrollment challenges. The fall class data suggested that students (n = 9 of 16 invited, age range 22-46) taking online classes found web conferencing is similar to face-to-face interaction with the instructor, and 62.5% report interactions with students were the same online, with 25% reporting the student interactions were better than face-to-face (Englehart, 2015). A majority of fall students (75%) agreed that online meetings were conducted similarly to face-to-face, while 65% of spring students (n = 7 of 27, age range 21-28) expressed a preference for web conferencing due to increased connectedness and timely access to the instructor.

In a larger study over a four-year period, Rennar-Potacco, Orellana, Chen, and Salazar (2016) used a quasi-experimental non-equivalent post-test design (N = 1276) to study tutoring in STEM courses. Tutored students (n = 644) had the option of web conferencing or face-to-face appointments. Web conferencing tutoring students were proportionally more likely to be female, commuters or minorities, with an average age of 25. Face-to-face tutoring students' average age was 22, and the average GPA of these first two groups at the beginning of the term were the same. Those who were tutored and received a grade of C and above were not significantly different between web conferencing (89.5%) and face-to-face (79.2%), however those who chose

to decline tutoring services had a significant difference (70.8% with a grade of C and better). Retention of tutored students was not found to be significant (web conferencing 81.8%, face-to-face 88.2%), while students who refused tutoring had a significant difference in retention (78.7%). Overall, web conferencing is as effective as face-to-face tutoring in improving short term retention (measured by course completion rates). These findings in the online environment offer a possible solution for online students who report their preference for face-to-face academic advising appointments despite being geographically separated from campus and attending in the online format (Gains, 2014; Noonan & Stapley, 2015). The next section examines a popular concern about age and technology use.

Generational preferences for technology. There is age and generational research on the use of technology, addressing perceptions and preferences on web conferencing. Schoch (2012) suggested that members of Generation Y (born between 1980-1999) were like members of Generation X (born between 1965-1980). Both generations favored virtual meetings over face-to-face meetings at work because information communication technology allowed them to control when and how they accessed content. However, Severt (2013) found that undergraduate Gen Y (those born between 1980-1999) students preferred face-to-face meetings despite their label as digital natives. Marc Prensky (2001) coined the phrase digital natives in his article titled "Digital Native, Digital Immigrants." He defines digital natives as those who grew up in the digital age, or in other words, those in Generation Y. Although Prensky's (2001) believed that a person's generational cohort impacted how one thought and processed information with technology. This concept captured immediate attention, however it was not a scientific article. Critical of Prensky's (2001) work, White and Le Cornu (2011) proposed an alternate idea based on individual choice, where digital visitors (those who had a task and used technology as a

resource) and digital residents (those who looked for connections, networked, and left a digital footprint) formed a continuum of technology engagement modes. Schroeder (2015) in a phenomenological study ($N = 9$) found that graduate students preferred face-to-face advising, despite the mode of educational delivery (in class, cohort or distance education online). Both Severt (2013) and Schroeder (2015) disagreed with Prensky's (2001) idea that members of Generation Y would be more comfortable with receiving and sending information in a virtual environment. White and Le Cornu (2011) rejected the generational paradigm and presented an alternate idea of visitor and resident modes, which explained how people were motivated to engage with digital technology based on habits and preference. Furthermore, those who chose to be in resident mode built and maintained a social presence (White & Le Cornu, 2011).

Vosner (2016) studied older internet users in Slovenia ($Mdn_{age} = 60.5$). Analysis of their correspondence showed that more men than women use the internet, and that users from 55-64 years old showed a preference for Facebook, whereas 65-74 year-olds showed a preference for Skype (63% of this age group use Skype). Married couples were more likely to be on the internet, suggesting support in using technology was critical to this growing population (Vosner, 2016). Yuan et al. (2016) studied older adults in the mid-west United States and identified six factors in whether older adults embraced the use of information and communication technologies. Factors include: efficacy, beliefs, ease of use, social influence, past experiences, and attitudes towards learning a new technology (Yuan et al., 2016).

Yuan et al. (2016) and Vosner's (2016) research supports White and Le Cornu's (2011) visitor and resident classifications of how people are motivated to use web conferencing. Table 7 summarizes the comparison of synchronous online and face-to-face research. Table 7 also helped to illustrate that across all age groups, despite a preference for face-to-face

communication, web conferencing was a convenient, accessible and economical way to cross distances and keep in touch (Richardson, 2012).

Table 7

Synchronous face-to-face versus synchronous online

Author (year). Participants=n	Synchronous Face-to-Face	Synchronous Conferencing
Abrams et al. (2015)	Supports dialog complexity	Supports dialog complexity
Fabregas-Ruesgae et al. (2015). *N* = 38	73.7% ranked online conferencing tool good or better	86.8% ranked usefulness of conferencing tool good or better
Englehart's (2015). *N* = 9	Undetermined due to research design error	62.5% same, 25% better for student interactions vs. face-to-face
Rennar-Potacco, et al., (2016). *N* = 1276	Final Grade and Retention outcomes for STEM tutoring	= no significant difference between face-to-face and VC in GPA or improving retention
Schoh (2012)		Generation X & Y preference at work offers control of access to content
Severt (2013)	Generation Y prefer face-to-face despite digital native label	
Schroeder & Terras (2015)	Graduate students prefer face-to-face interactions despite delivery mode of courses (cohort, online, on campus)	
Vosner et al., (2016)		63% of 65 to 74-year-olds in study used Skype
Yaun et al., (2016)		Factors for embracing technology: efficacy, beliefs, ease of use, social influence, past experiences, and attitudes towards new technology

In conclusion, initial web conferencing research studied two major themes. Comparisons of two synchronous environments, face-to-face versus web conferencing, found no difference in dialogue, learning, grades, or short-term retention. Generational attitudes and preference research, on the use of web conferencing and technology use in general, included a discussion of digital natives/digital immigrants (Prensky, 2001) versus visitor/resident modes (White & Le Cornu, 2011). Research suggests support for the visitor/resident mode classifications (Vosner, 2016; Yaun et al., 2016). The classification modes of resident and visitor seems to fit the idea of an online community of inquiry. Online classroom research using COI and synchronous web conferencing provides further encouragement for synchronous options in supporting online students. These findings in the online environment offer a different paradigm of age and the use of technology, which academic advisors should take into account as they assess the potential for additional ways to interact and communicate with their online advisees.

COI and synchronous web conferencing in online higher education. According to Aragon (2003) in his chapter titled *Creating Social Presence in Online Environments*, social presence is a factor that contributes to building a community of learners and must be one of the first components established to initiate learning online. Furthermore, web conferencing involves social presence that was "the degree to which individuals perceive intimacy, immediacy, and their particular role in a relationship" (Belderrain, 2006, p. 149).

Rockinson-Szapki (2012) studied the influence of computer-mediated communication systems upon the community, using the COI framework and the COI survey. The instructor taught two online classes, one undergraduate and one graduate. Students (n = 28) in each class were split into two groups. Group one communicated asynchronously, while group two had three additional synchronous discussions lasting from 30 to 90 minutes. Rockinson-Szapki

(2012) referred to video conferencing as e-conferencing. There was no significant difference in social, cognitive, or teacher presence between the two groups. In the synchronous group, however, student feedback suggested that social presence increased interaction, cognitive presence, and enhanced understanding. Additionally, there was increased inconvenience in participating in the same time and space, as well as the difficulty of technical problems. These comments are of interest when comparing the asynchronous group, who reported a lack of social presence due to limited interactions and no immediacy in response. Technical problems were mentioned, and both groups referred to their struggles with new technology in an eight-week course format.

Heiser, Stickler, and Furnborough (2013) combatted new technology issues at their institution by offering (N = 500 invited) student training in the use of a synchronous conferencing tool, through language classes over a 21-month period at the Open University in the UK. Heiser et al. (2013) stated that the required total time in synchronous teacher led oral practices in the totaled 20 hours per student. To combat issues with technology, as reported in other studies (Rockinson-Szapki, 2012), Heiser et al. (2013) introduced a student training program. The program included a one-hour workshop in the synchronous environment before the course began. Students reported an improvement in the level of confidence and competence in using the tool, which increased from 31% (group 1) to 62% (group three). Additionally, students recommended the training program to others. Indeed, 82% of participants in group three recommended the session to others (Heiser, Stickler, & Furnborough, 2013).

Han (2013), in a quasi-experimental design (N = 33, age range 28-61 years, M_{age} = 40, 77% female) used web conferencing with the experimental group, throughout an online eight-week graduate course. A 12-item social presence scale (Kaiser-Meyer-Olkin statistic value of

.87, reliable), included three factors (accounting for 78.4% of the variance): co-presence, psychological involvement, and discussion engagement. The instructor's video, showing non-verbal cues, made a difference in the experimental group's findings, as they reported a higher degree of perception of co-presence (mean increased by .569 to $M = 4.11$, $s_{control} = .910$ was broader than $s_{experimental} = .709$). Han (2013) reported a large Cohen's effect size of .70 for co-presence. Correlation analysis (at the .01 level, two tailed) revealed that all three social presence variables, co-presence (.728), psychological (.721), and discussion engagement (.726), showed statistically significant with satisfaction. Han warned that due to the small sample size, a possibility of a Type I error existed. Regardless, the distinction that student satisfaction correlates with an instructor's presence in a real time (synchronous) virtual classroom (Han, 2013) was important. It connects synchronous research with Garrison and Arbaugh (2007) who concluded that teaching presence had a significant impact on student satisfaction.

Stover and Miura (2015) also studied social presence, but within the bigger COI framework, like Rockinson-Szapki (2012). However, Stover and Miura (2015) didn't use the original COI survey. Instead they made minor modifications to include the term web-conferencing when appropriate in the COI survey (five questions modified of 34). Participants were graduate students ($N = 121$) across eleven online education courses with six instructors, all of whom had more than three years of online experience. They compared classrooms with asynchronous versus synchronous web conferencing and the impact on the COI framework, as well as each of the elements, teaching, social, and cognitive presence. Web conferencing participants reported higher scores in the survey for social, teacher, and cognitive presence as well as overall COI ($M_{web\ conferencing} = 4.51$ versus $M_{asynchronous} = 3.8$). The answers to the three open-ended questions were coded ($n = 242$), and web conferencing received the highest

percentage of positive comments. Instructor's facilitation (teaching presence), open communication (social presence), and exploration (cognitive presence) received the majority of the positive feedback for each COI element.

Leader-Janssen, Nordness, Swain, and Hagaman (2016) used the COI survey to evaluate an entire academic program. The COI survey designed for an online course was modified so that the term program replaced course, and the instructor became instructors. A new online graduate program in special education for emotional and behavioral disorders required evaluation (Leader-Janssen, Nordness, Swain, & Hagaman, 2016). Current students (representing year two, three, and four of the program) were invited to participate ($N = 51$), and close to half responded ($n = 25$). The program consisted of courses with a mix of both asynchronous and synchronous technologies. Leader-Janssen et al. (2016) found that teaching presence and cognitive presence were rated with high satisfaction, and social presence scored lower. Unfortunately, none of the four adjuncts used a synchronous tool in their classrooms.

In summary, synchronous web conferencing in the online higher education environment reported support for the idea of social presence and the COI framework (Aragon, 2003; Leader-Janssen, Nordness, Swain, & Hagaman, 2016; Rockinson-Szapki, 2012; Stover & Miura, 2015). Training programs on web conferencing technologies increased student levels of confidence and competence (Heiser, Stickler, and Furnborough, 2013), while research using a social presence scale reported high satisfaction with web conferencing in co-presence, psychological, and discussion engagement (Han, 2013). Despite Rockinson-Szapkia's (2012) findings of no significant difference in the COI survey between asynchronous and synchronous web conferencing ($N = 56$), other studies found web conferencing tools scored higher in social

presence, teaching presence, cognitive presence, and COI scores (Leader-Janssen, Nordness, Swain, & Hagaman, 2016; Stover & Muira, 2015).

These findings indicate that web-conferencing could enhance online academic advising as the perception of technology across age and online educational setting is equivalent to face-to-face. The research was limited in online academic advising in this area, but necessary since asynchronous communications are found lacking.

Online student services, web conferencing, and one-on-one relationships. Lietzau and Mann (2009) studied three scenarios using web conferencing with Information and Library Service classes at the University of Maryland University College (UMUC). This was a unique study as it provided data to support the viability of web conferencing use outside of the online classroom. The authors touted UMUC as the largest online public university education provider, with over 90,000 students. Lietzau and Mann (2009) used quantitative surveys (no discussion of validity) in a quasi-experimental design, using graduate research library workshops embedded in specific sections of a graduate research classes. Web conferencing tools included Adobe Connect and Wimba. Lietzau and Mann's (2009) first scenario involved multiple parts of a mandatory five-week library research course, which met via web conference twice and utilized an online asynchronous course management system. The first web conference focused on choosing and using databases, using BOOLEAN terms, and posing research questions. The second web conference focused on APA style, in addition to a citation and bibliographic management tool called RefWorks. Interactive tools within each 90-minute workshop included screen sharing, whiteboard, and chat function. Data collected through student surveys ($N = 71$, 23.6% response rate) and final project scores showed that students in the course sections who had access to the web conferencing workshops scored an average of 5% higher. Unfortunately,

the response rates were low for both Wimba (39 of 100) and Adobe Connect (32 of 200). The majority of participants (88%) said they were willing to participate in web conferencing again, despite over half reporting technical or software related issues. Lietzau and Mann's (2009) second scenario studied web conferencing internationally with management doctoral students located in Taiwan. Using Adobe Connect, the one-on-one web conference with each student in research methods and design course focused on developing a research question and literature review. Preplanning before the web conference included an outline from the librarian. Ten of the 20 students returned surveys (50% response rate) and listed technology (audio and internet connection), time zone, and language barriers as issues. Some librarians supplemented the technical difficulties by using Skype, while others used the chat function to enable students to translate the text before replying. According to Lietzau and Mann (2009), librarians also reported that the few times web cameras were used they increased the "personal value to the sessions" (p.115). The third scenario tested group RefWorks tutorials for both faculty and students. Six sessions of about ten participants each, half offered in either Adobe Connect or Wimba, were assessed as successful, and written comments on the survey included comments like "seeing someone else do it makes a difference" (Lietzau & Mann, 2009, p.155). The fifth scenario included a Wimba focus group for faculty, where chat transcript and polling data were captured and archived (with prior permission from participants). In conclusion, Lietzau and Mann (2009) reported that students (in a group or one-on-one) and faculty (in a group) after web conferences indicated that learning improved, and real-time interaction was appealing within online classes.

Lietzau and Mann's (2009) research strived to connect emerging technology with online students by embedding an online student service, like the library, into a teaching environment.

Additionally, Lietzau and Mann (2009) could have been the first to study an online student service and report on one-on-one student interactions using web conferencing. The literature expanded beyond initial groundbreaking studies. Through the use of web conferencing from a teaching perspective, the research showed how online higher education research measured the whole COI framework and the individual COI elements.

Emerging research on COI and one-on-one relationships, and the use of web conferencing was meager (Stenbom & Cleveland-Innes, 2012; Stenbom, Hrastinski, & Cleveland-Innes, 2016). Stenbom and Cleveland-Innes (2012) studied coaches in a math-tutoring program who tutored teenagers up to the age of 21. Another twist on the study was that the tutors answered the COI instrument, which was modified for one-on-one interactions. Despite these differences from the current study and population, it is of interest that Cronbach's alpha on the modified tutor COI items revealed that items could be successfully adapted for one-on-one interactions.

Chapter Summary

In conclusion, a critical review of the literature revealed five key sections: theoretical framework, online student support, the academic advising profession, technology and communication, and online conferencing. The academic advising field was a key component within online student services (NACADA, 2011). Unfortunately, a gap existed between student's preference for face-to-face interactions and the predominant use of email communication by academic advisors (Gaines, 2014; NACADA, 2011; Nichols, 2010; Noonan & Stapley, 2015). Mirriahi (2015) suggested that despite student demand for more use of technology in administrative and assessment purposes, overall higher education courses and student services continue the trend of using more conventional technology. Web conferencing

offered a way to close the gap, and possible intentional uses for synchronous virtual interactions have been speculated upon for online academic advising (Steele & Thurmond, 2009). Meanwhile, the COI framework research continues to expand beyond the asynchronous online classroom to evaluate synchronous communications, assess programs, and one-on-one interactions.

Chapter 3 – Research Design and Methodology

Chapter three describes the research questions, research design, and survey information. The procedure section and data analysis will conclude the chapter.

Research Questions

The three research questions for this study were:

1. Is there a relationship between COI scores, based on preferred advising appointment technology, as categorized by the COI instrument mean score?

   Ho = $p = 0$

   Ha = $p \neq 0$

   a. Teaching Presence
   b. Social presence
   c. Cognitive Presence
   d. COI framework

2. Is there a relationship in scores of COI and its elements (teaching, cognitive and social) based on demographic characteristics?

   Ho = $p = 0$

   Ha = $p \neq 0$

   a. Gender
   b. Ethnicity and Race
   c. Age
   d. Number of courses successfully completed towards degree
   e. Number of courses successfully completed online at other institutions
   f. Number of courses successfully complete online at institution

g. Online start date at institution (term and year)

3. Is there a relationship between presence scores (teaching, cognitive, social and COI) with importance rankings, as categorized by the COI and importance ranking scores?

   Ho = $p = 0$

   Ha = $p \neq 0$

Variables

For all research questions, the primary dependent variable was the COI survey scores, with five ordered levels: *strongly disagree*, *disagree*, *neutral*, *agree,* and *strongly agree*. Research question one had one independent variable: the preference of advising appointment technology. Research question two had both quantitative and categorical independent attribute variables. The quantitative independent attribute variables included: age, completed online courses, online starting semester and year at the institution, and number of courses completed towards a degree. The categorical independent attribute variables included: ethnicity, race, and gender. Research question three had two dependent variables: the importance rankings and the COI score.

Research Design

The research design for this study used a comparative approach with an online instrument, including open-ended questions. This study used a confidence level of 95%.

Description of the Research Site

The doctoral-level public land-grant university used for this study was in the Midwest region of the United States. According to the Carnegie classification of institutes of higher education, this university was one of only 115 institutions classified as an R1: Doctoral University, which is the ranking for highest research activity, for institutions in the United States.

The online education unit has over 50 years of serving online and distance education students. Student and Faculty Services, within the online college, offered student services and academic advising. The online college utilized a total-intake-model with full-time staff advisors.

Population

In spring one, there were 374 students enrolled in undergraduate coursework online. Refer to Appendix I for the population table, which illustrates the number of enrollments, gender, age by the range and means (M), classification, and percentage of total population by race. Ethnicity was not provided for the population. Males (n = 78) represented 20.7% of the student population, while females were 78.3% (n = 298). The total population ranged in age from 18 to 58, with an arithmetic mean of M=31. Finally, the student classifications for the population revealed that seniors were in the majority, at 76.3% of the population (n = 287), with juniors at 15.9% (n = 60), sophomores at .06% (n=24), and freshmen at .01% (n=5).

Sample

The sample frame covered undergraduate degree-seeking online students (n = 374) in the spring one, 2018 term. Dillman, Smyth, and Christian (2014) defined complete coverage as the ability to reach out to the entire population perfectly, as in a membership list. Although 118 participants started the survey, 20 students did not continue after the first question. Designed as a filtering question for anyone younger than 18, the age question required an answer. There were zero respondents under 18. Eleven students did not answer the COI or importance items in the survey. Total, 87 students participated in the COI and importance items. The completed response rate from the invited participants (N = 374) was 23.3% or n = 87. The confidence level of 95% (.05) was used to calculate a confidence interval (also called the margin of error) of 7.78.

Protection of Human Subjects

Before conducting this study, the researcher received IRB approval from the Institution's Review Board (IRB) within the University Research Compliance Office (refer to Appendix A). A letter of authorization from the online college contained all necessary permissions and approvals to research, as outlined in the proposal (refer to Appendix B).

Although participation in this study involved minimal risk, there existed a potential loss of privacy. Several strategies were employed to avoid a potential loss of privacy. First, a feature in Qualtrics, a comprehensive survey software, disabled the collection of IP addresses. Additionally, the Qualtrics anonymous survey hyperlink did not collect any personal data (name, email address, phone, IP address). Finally, no identifying information was revealed in open-ended comments.

All electronic files relating to this research were password-protected. Physical files, such as individual notes, were securely maintained in a locked desk to which only the researcher had access. The terms *online college* and *institution* replaced the names of the institution and the online college to prevent identification of the population after the publication of this dissertation to ProQuest dissertation and in other public formats. This protection measure included the research question subcategories, instrument items, and full text of the paper. Text redactions and removal of identifiable content (signature lines and letterhead), within the IRB letter and online college approval letter, were also completed with the intent of protecting the identity of the institution, the online college and its students.

Survey

Research on the Community of Inquiry framework has continued to evolve over the past two decades. First, COI research expanded from qualitative transcript analysis to the

development of a quantitative instrument. Early COI online classroom participants were predominantly graduate students in business and administration programs (Garrison et al., 1999). Second, focus on groups in online classrooms expanded to include the assessment of whole programs (Kumar & Ritzhaupt, 2014). New technology advancements influenced minor modifications to the COI survey instrument for a 3D virtual world (McKerlick et al., 2011) and synchronous communications such as web conferencing (Stover & Miura, 2015). Finally, the COI instrument was recently used in research for one-on-one relationships (Stenbom, Hrastinski, & Cleveland-Innes, 2016), further expanding the research possibilities of the COI framework. This study utilized the COI quantitative survey with modifications for academic advising.

Arbaugh et al. (2008) developed a revised COI survey (2nd version) with 34 items using a five-point Likert scale to quantitatively measure students' perceptions of the level of the COI in online courses ($N = 287$, across four institutions). The COI survey included three subscales to measure teaching presence, cognitive presence, and social presence. The COI survey was under a Creative Commons license and listed as an open resource (COI, 2017). Supplemental details for survey modifications, reliability, validity, and description questions are in Appendix J.

Survey modifications. For the current study, the term *academic advisor* replaced *instructor* throughout the COI items. Modifications included replacing the word *instructor* and *course* with appropriate references to an academic advisor and advising. Appendix J compares the original COI statement with the modified academic advising statement and a brief overview of previous COI statement modifications. Additional modifications included ten demographic and open-ended questions. Appendix D provides a copy of the modified academic advising COI survey.

Additional modifications recommended by Gillman, Smyth, and Christina (2014) included the removal of the question and scoring numbers from items, in order to reduce the response time. As the Likert scale numbers provided a way to calculate summative scores (scale ranging from 1 = *strongly disagree* to 5 = *strongly agree* for COI), the numbers were removed from the published survey and only included in the researcher notes for data analysis. Participants saw only the text labels for the COI scale choices, ranging from strongly disagree to strongly agree.

Importance ranking. Diaz et al. (2010) were the first to capture student ratings of the relative importance of each of the 34 COI items. Importance scores were included to help inform the exploratory research of COI and academic advising online. Student's ratings of importance were measured using a five-choice unipolar ordinal scale, which ranged from unimportant to extremely important. This scale provided categories of importance, as a student may be reluctant to mark an item as unimportant (Diaz et al., 2010). Following the guidance of Gillman, Smyth, and Christian (2014), who noted the reluctance of participants to respond to surveys, numerical scoring labels were removed for the participant survey. The researcher used the scoring numbers to calculate summative scores: 1 = *unimportant*, 2 = *somewhat important*, 3 = *important*, 4 = *very important*, and 5 = *extremely important*. Permission to use the importance ranking is reported in Appendix K. Diaz et al. (2010) did not discuss item order effect.

Additional descriptive questions. Collaboration with online college leadership resulted in the development of the descriptive demographic questions (refer to Appendix I). Answer choices for several demographic questions, such as gender and age, were designed to match the categories used in the online college's Annual Report. The technology choices for online advising appointments matched the current operations at the institution (phone/TDD, web

conferencing). The undergraduate course completion item choices included both the institution's undergraduate classification levels and the appropriate range of hours for each level.

Age was used as a filtering question. Any participants who answered that they were less than eighteen years of age were immediately navigated to the end of the survey. An exit message explained they had not met the eligibility requirements for continuing the survey and thanked them for their time. Although ethnicity was not available for the population, the survey included questions on ethnicity and race. The questions on ethnicity and race came directly from the Department of Education's reporting guidelines, which required a series of two questions (72 Fed. Reg. 59266, 2007). The online college's leadership wanted to know approximately how many online classes participants had successfully completed at other institutions. Additionally, participants responded to a query concerning the online experience at this institution. The measurement of *online experience at other institutions* was new for the online college.

Reliability of the original COI instrument. There were multiple reliability studies on the COI instrument. According to Arbaugh et al. (2008), the reliability of the COI survey was analyzed using scores from across four higher education institutions, α =.84. In a large-scale study, Shea, & Bidjerano (2009) supported the three-factor teaching presence (n = 2159 online students), validating the construct validity of the COI framework. Bangert (2009) was the first to include undergraduate students, and also was the first to use both confirmatory (n = 587) and exploratory analysis (n = 587) for teaching α = .96, cognitive α = .95, and social presences α = .91. Bangert (2009) found a root mean square error of approximation of .69 with a 90% confidence level, a reasonable fit between model and population derived from the sample, and the power calculation with a chi-square test (df = 524, n = 578), which exceeded 1 (1= *highest power*). Diaz et al. (2010) expanded the validity research on the Arbaugh et al. (2008), by

expanding the survey to capture the student importance rating (n = 412, undergraduate and graduate). The rating of importance was scored using an ordinal scale with 5 = *extremely important*, 4 = *very important*, 3 = *important*, 2 = *somewhat important*, and 1 = *unimportant*. Diaz et al. (2010) reported teaching presence (M = 4.05, s = 0.95, α =.91), cognitive presence (M = 3.77, s = .99, α = .94), and social presence (M = 3.52, s =1.18, α = .94) in order of importance, matching the COI survey element order. Teaching presence ranked highest, cognitive presence ranked second highest, and social presence ranked third. The reported Cronbach Alpha internal consistency scored higher than .85 for each of the three presences, which is high internal consistency (Gliner et al., 2009).

Validity. Construct validity was determined by asking the online college's leadership team, the Interim Dean, Associate Dean, and Director to review content. Additional reviewers inlcuded two tenured faculty members, who were engaged in the development of Web-based distance education courses for delivery at their institution and subject matter experts on advising, and Dr. Randy Garrison, one of the original COI framework authors (refer to Appendix L).

Sample coverage error, defined as when the sample does not accurately reflect the population (Dillman et al., 2014), was avoided as complete coverage of the sample frame or all enrolled undergraduate degree-seeking students in the spring semester, term one, 2018, were invited to participate. This research avoided sampling error by having complete coverage of the sample frame. The sample frame was defined as the "list of members of the target population" (Dillman et al., 2014, p. 57). This research study limited nonresponse error by comparing responses of attribute variables to the known population attributes for the spring one, 2018, term (refer to Appendix P). The instrument limited measurement error due to inaccurate answers (Dillman et al., 2014) by using standard questions and answers based on the online college's

annual report categories for age and undergraduate classification. Questions concerning ethnicity and race utilized the regulated format from the Department of Education. The validated COI instrument included a decade of research. Finally, regarding extraneous concerns or environmental events, there were no anticipated concerns.

Thinking out loud cognitive interviews. Due to the modifications on the COI survey for assessing the presence of COI in academic advising, a test of the survey was conducted using cognitive interviews (refer to Appendix I for a list of modifications). Gillman, Smyth, and Christian (2014) referred to these interviews as, "thinking out loud cognitive interviews" (p.244). Cognitive interviews have become an accepted practice to test surveys and individual items. Indeed, the US Census Bureau has mandated that any wording changes to an item requires a cognitive interview assessment (Terry & Fobia, 2017). According to Gillman, Smyth, and Christian (2014), cognitive interviews could offer participant insights that a pilot field test could not achieve. Interviewees shared everything they were thinking as they went through the survey, sharing out loud with the interviewer as they read, processed, and answered each item. In phase one, cognitive interviews were conducted with two professional academic advising staff (females, both with over five years of experience in advising) and two faculty advisors (females, both with decades of faculty advising experience) to collect feedback on the modified instrument. The feedback included revisions to the wording of statements, question order, and future concerns about the visual design in Qualtrics and possible navigation problems to avoid. In phase two, three online students with different online institutions, online experiences, and characteristics volunteered for cognitive interviews. Student one was an online undergraduate student, single, female, employed full time, 23 years old, a junior, and attended a four-year research two, public land grant institution in the great lakes region of the United States. Student

two was an online undergraduate student, divorced with a child, female, employed full time, 38 years old, a senior, and attended a four-year Master's college, private not-for-profit institution. Student three was an online graduate student, married with adult children, female, employed full time, and over the age of 45, and attending a four-year research one, public land grant institution. These student interviews resulted in a few additional survey items adjustments, such as the addition of the word *successfully* to questions five, six, and eight, which ask about completed coursework. The researcher also shared Appendix I, showing the modifications for the Academic Advising COI survey, as well as the proposal and research timeline with Dr. Randy Garrison, one of the original COI survey authors. Appendix L provides a copy of the communication and Dr. Garrison's reply that the "modifications seem more than reasonable."

Phase three required the building of the survey into Qualtrics. Ensuring students would not only have access, but a high-quality display, despite device or screen size (Gillman, Smyth, & Christian, 2014), required testing the survey design in Qualtrics for effectiveness on mobile, tablet, and laptop computers. Evaluation of the visual design included size and labeling, the layout of response categories, spacing, the location of special instructions, and overall layout. A second round of cognitive interviews collected feedback from two online students who tested multiple devices (mobile, tablet, and laptop) and operating systems (i.e., iPhone, Android, Windows, Macintosh). These student interviews resulted in a few additional adjustments, such the addition of different font styles and sizes to help differentiate between instructions and questions for mobile devices. The cognitive interviews for the mobile adjustments reported significant improvement, and both online students were satisfied with the online survey across all device types.

Procedures

The procedures section includes an overview of selecting and contacting the students, data collection methods, and administering the survey.

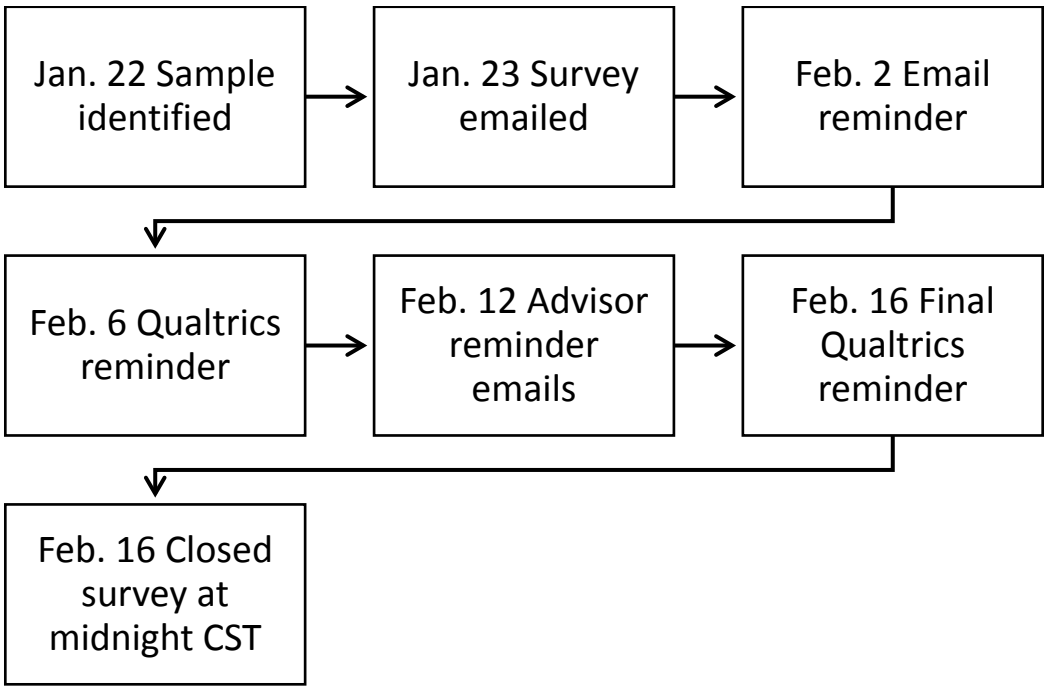
Selecting and contacting the sample. Online degree-seeking undergraduate students enrolled in the spring one, 2018 term were asked to participate voluntarily in this research. During the recruitment of participants, a survey cover letter (Appendix C) was distributed along with the survey, clearly outlining the scope of the research as well as emphasizing the voluntary nature of participation and that refusal to participate would have no consequences. Participants received no incentive to participate. Response rates were traditionally low to online survey requests, which relied only on email (Dillman et al., 2014). Online college leadership reported that the online survey response using student emails was around 20-25% at the institution. Therefore, the mixed-mode recruitment to participate strategy of Dillman et al. (2014) became the utilized plan to contact students. According to Dillman et al. (2014), in the recruiting phase, multiple modes of contact were desirable in order to achieve a higher response rate, develop trust or convey benefits of participation. With that guidance in mind, the survey recruitment involved communication to students' email, through Qualtrics, as well as a reminder from their academic advisor.

Data collection methods. The researcher designed the online survey utlizing Qualtrics. Qualtrics is a comprehensive survey software program which provided an online website for the survey, with a design space, simplified reporting tools, and online training modules. The Qualtrics security measures included password and user credentials, which prevented unauthorized access. Statistical programs, such as the Statistical Package for the Social Sciences (SPSS) and Excel downloaded, exported data from Qualtrics.

Administering the survey. Figure 6 illustrates the administrative timeline for the study conducted in spring one. The multimodal communication strategy used student emails. The timeline displayed events in chronological order. Figure 6 illustrates the flow of communication, along with the launch and closure dates of the survey link. The distribution efforts through the student's school email accounts provided an opportunity to send emails to 100% of the online undergraduate population and to report population demographic information on all eligible students in the spring one term, 2018. Multiple email reminders (from Qualtrics and advisors) encouraged participation and provided timely reminders.

Figure 6

Administering the Survey



The online college determined eligible students and used student emails in order to introduce and share the survey link during the second week of the spring one term, on January 23, 2018.

Students were encouraged to complete the survey through multiple follow-up emails from Qualtrics and academic advisors. Refer to Appendix C for the survey cover letter, which includes all IRB criteria, including a notice that participation was voluntary. Appendix D includes the modified academic advising COI survey used in the cognitive interviews.

Instrument Analysis

To measure the effect of question order, survey participants were assigned evenly to one of two conditions when they entered the Qualtrics survey. The first condition had the importance ranking items first and then the COI items. Condition 1 included 60 participants, but only 48 completed the COI (M = 3.86, response rate = 80%) and 37 completed the importance items (n = 37, M = 3.64, response rate = 61.6%). The second condition presented the COI items first and then the importance ranking. Condition 2 included 58 participants, but only 39 completed the COI (n = 39, M = 4.09), while 50 completed the importance items (n = 50, M = 3.57). A Mann-Whitney test of independent means failed to reject the null hypothesis of no difference. There was no difference in means for COI overall scores between Condition 1 and Condition 2 (U = 787, z = 1.27, p = .20, α = .05). A Mann-Whitney test of independent means failed to reject the null hypothesis that there was no difference in means for Importance rankings between Condition 1 and Condition 2 (U = 867.5, z = .493, p = .62, α =.05, $Mdn_{condition\ 1}$ = 3.85, $Mdn_{condition\ 2}$ = 4.12). The failure to reject the importance and COI null hypothesis resulted in no question order effect in the research findings.

Cronbach's Alpha calculated internal consistency scores (Gliner et al., 2009). The test criteria matched the academic advising instrument, as it was appropriate for a single test with multiple choice questions such as Likert scales, and one administration of the instrument. A Cronbach's Alpha score of .80 was preferred to support internal consistency. All Cronbach alpha

scores for categories, elements, and COI exceeding the alpha of .80, which was the cutoff of a good scale, were retained. The academic advising COI instrument had an alpha of .884. The teaching presence element (α = .971) categories were direct instruction (α = .851), facilitation (α = .959), and design and organization (α=.920). The social presence element (α = .873) categories were affective expression (α = .825), open communication (α = .885), and group cohesion (α = .893). The cognitive presence element (α = .913) categories were triggering event (α = .894), exploration (α = .863), integration (α = .881), and resolution (α = .924).

Data Analysis

The data analysis section includes an overview of quality check measures on the data collected. Research questions organize the discussion of data analysis into sections. Research question one analyzed responses to the COI items and technology preference. Research question two involved analyzing the descriptive statistics. Research question three analyzed COI item scores and importance ratings. Ladder graphs illustrated the gap analysis between COI items and their importance rankings for research question three. For the fourth question, there was a discussion of the qualitative analysis of open-ended comments.

An initial review of survey answers and descriptive statistics between Qualtrics and any download ensured data was appropriately transferred. Since the survey was voluntary, skipped questions were allowed. Missing values were examined to see if there was any pattern which could skew the data.

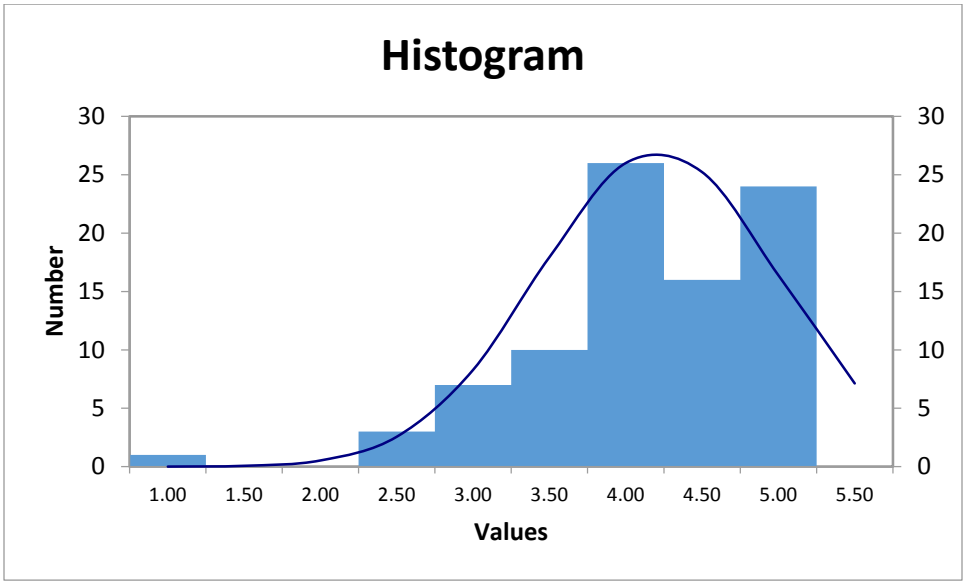
Three basic statistical assumptions for the use of parametric techniques were examined: the assumption of normality (population), homogeneity of variance (equality of group variance was not applicable to this research, as the sample was not divided into groups), and the assumption of independence (all participants were independent of each other). First, an

inspection of the histogram of the distribution of COI scores was conducted (see Figure 7). Second, the Shapiro-Wilk (1965) test of normality calculated a p-value of < .001. The p-value was less than the chosen alpha .05, so the null hypothesis (population normally distributed) was rejected.

Although a different test of normality, the Anderson Darling test revealed that an A^2 value of .946 fell above the 95% critical value of .787 (matching Shapiro-Wilks result, rejecting the null assumption of a normal distribution). The calculated value fell below the 99 % critical value of 1.092. In other words, the null hypothesis (population normally distributed) was rejected at 95%, but not at 99%.

Figure 7

Sample Distribution of AA COI scores

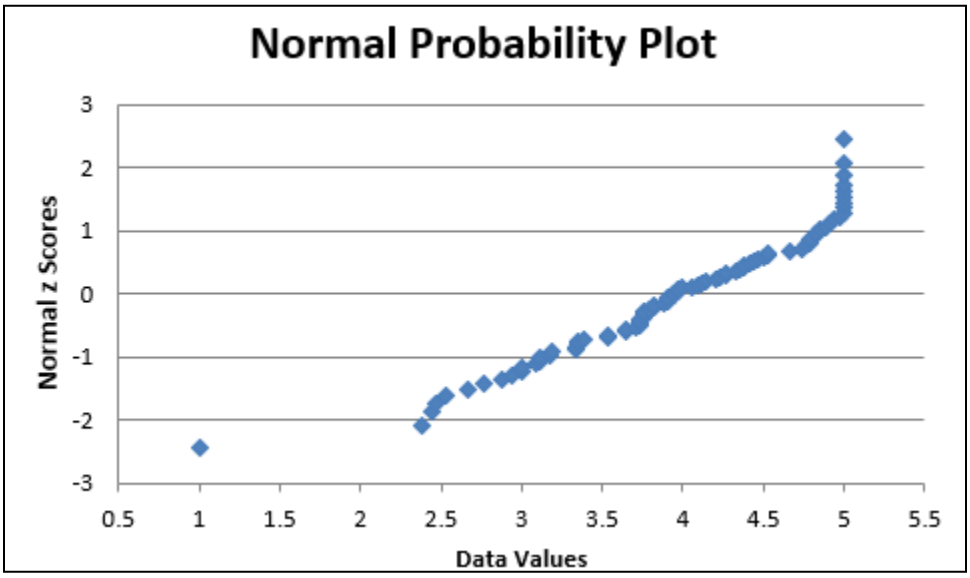


Further visual analysis revealed the histogram in Figure 7 is negatively skewed. The calculated skewness was -.777, between +/- 1 and +/- .05, which was the range of moderate skewness, where -.5 to .5 would be an approximately symmetrical distribution. The negative

value confirmed the visual interpretation that the left tail was longer, skewed left, otherwise called negatively skewed. The sample skewness divided by the standard error of skewness resulted in a value of -3.01. The value -3.01 was the calculated number of standard errors for the sample skewness. A value less than < -2.00 meant that the population was very likely skewed negatively.

Figure 8

Normal Probability Plot of AA COI scores



Kurtosis, or the shape of the central peak and tails, was calculated at 1.020 more than the normal curve kurtosis value of 3. A leptokurtic kurtosis was revealed in the histogram in Figure 7, showing a higher peak and longer and fatter tail than a normal distribution, otherwise referred to as a peaked distribution or positive kurtosis. The calculated number of standard errors of sample kurtosis was 1.997, between -2 and +2, so no conclusion could be drawn about the population kurtosis. The D'Agostino-Pearson omnibus used the test statistics for both skewness and kurtosis to calculate a single *p*-value to determine if the dataset was different from normal (*n*

= 87). The calculated *DP* was 13.05, exceeding the critical *p*-values for .05 (5.99) and .01 (9.21), which resulted in the rejection of the null hypothesis (which assumed a normal distribution). Only at the extreme alpha of .001 was the critical value of 13.82 higher than the calculated *p*-value of 13.05.

A final way to test normality was to construct a normal probability plot. As shown in Figure 8, although most of the plotted scores fell close to forming a normal line, there were multiple plotted scores at the bottom and top of the line, illustrating the lowest mean score of 1.00 ($n = 1$) and a highest mean score of 5.00 ($n = 9$). The Pearson product-moment coefficient of correlation (Pearson *r*) was .9694, less than the critical value of .9856, for a $n = 87$, so the data was not close enough to normal ($r >$ critical to be close to normal). In conclusion, through visual inspection and multiple tests, the data set in this research was not normally distributed, but rather non-parametric.

Non-parametric techniques were used, such as the Mann-Whitney *U* test, as it was the alternative to the *t*-test for means for non-normally distributed data (Gliner et al., 2009). The Mann-Whitney *U* test required independent variables with two or fewer levels, while the Kruskal-Wallis *H*-test for non-normal distributed data required independent variables with two or more levels.

Analysis plan for research question one: community of inquiry analysis and technology. The survey responses were analyzed quantitatively using the survey score sheet as presented in Appendix M. Appendix M illustrates the items organized by category, which form each of the three presences. The open-ended question responses were analyzed qualitatively using a-priori codes and classifications as presented in Appendix N. The combination of quantitative and qualitative data analysis on the COI survey items and open-ended questions

provided findings to research question one: was there a correlation in COI scores based on preferred advising appointment technology, as measured by the COI instrument mean score? This question was a single-factor design (between groups) with two levels. The dependent variable was the score from the COI survey, and the independent variable was the advising appointment technology: web conferencing or phone/TDD.

Quantitative analysis for COI. Quantitatively, students' ordinal responses to the 34 advising COI items accessed overall scores for teaching presence, cognitive presence, social presence, and COI. Using a bipolar scale, a five-point Likert-type scale, choices ranged from strongly disagree to strongly agree. The bipolar scale allowed measurement in a direction (positive and negative) and a level of magnitude of opinion, such as strongly agree (Dillman et al., 2014). Summative data calculations used the assigned number value for each item answer: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Reported overall mean scores and stand deviations aligned with each element and category (refer to Appendix I for survey items). The comparison of the mean for the advising appointment technology variable for two levels included Cohen's effect size typology (*ES* = .20 small, *ES* = .50 moderate and *ES* = .80 large). Thirteen items measured teaching presence in the modified Academic Advising COI survey. Nine items measured social presence, while twelve items measured cognitive presence.

Analysis plan for research question two: descriptive analysis. First, the completed sample compared differences in population characteristics from online annual report categories for spring one, 2018, with term enrollment, revealing similar results. Answer categories for ethnicity and race matched Department of Education reporting requirements and age categories matched online annual reports to allow for comparisons.

Second, descriptive statistics were essential in order to discuss the results of research question two was there a correlation between COI and its elements (teaching, cognitive and social) based on demographic characteristics? This question was a single-factor design (between groups) with multiple levels, depending on the variable. Moderator independent variables could affect the dependent variable COI scores (Fraenkel, Wallen, & Hyun, 2012). The report for each independent variable included summative means and standard deviation of COI and the elements. Independent moderator variables included: gender (two levels: female or male), ethnicity (Hispanic (yes/no), and race (nine levels: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White, and those who report multiple races).

Third, quantitative independent variables vary by degree of quantity (Fraenkel et al., 2012). The report for each quantitative independent variable included summative means and standard deviations of the COI, elements and categories. The quantitative independent variables included: age (five levels), successfully completed credit hours (five levels), successfully completed online courses at institution or other institutions (five levels), and start term and year with institution. Successful course completion questions provided data to report solo and multi-institutional online experience, as well as overall quantity of experience in the online environment. Start term and year with the institution provided data for reporting the length of time as a student with an online advisor. Pursuit rate was not important, as advisors stay in contact with their students regardless of enrollment status. Appendix O explains the formula used in calculating the length of time with academic advisors, using the reported start term and year.

Analysis plan for research question three: Importance ranking of COI items. The descriptive comparison between COI and importance scores and the investigation into the importance rankings provided information to answer research question three: was there a correlation between presence scores (teaching, cognitive, social, and COI) and importance rankings (as measured by the COI and importance ranking scores)?

A unipolar scale measured importance. Dillman et al. (2014) defined unipolar as a one dimensional (positive in this case) spread of categories. Importance questions were answered using the following categories: *unimportant*, *somewhat important*, *important*, *very important*, and *extremely important*. Importance scores included mean and standard deviations for each of the 34 COI items. Collective scores for each of the COI elements were computed to determine the importance scores for each, while Cronbach's Alpha revealed internal consistencies scores for the importance of each element: teaching, cognitive, social presence, and COI.

Finally, a descriptive comparison of results for support and item-importance ratings revealed any areas of critical dissonance (high importance, low COI score), while confirming any areas of strength (high importance, high COI score). Ladder graphs illustrate the importance and COI score for each of the 34 items, subscales, and elements: teaching, cognitive, and social.

Qualitative analysis plan for technology and academic advising experiences. Qualitative data analysis examined the participant's answers to the open-ended question. Question 10 was *please comment on your experience with the technologies how they influence your academic advising experience*. The participant could select more than one technology choice and were asked to comment on every technology option they report experiencing. Two individuals reported experiences with other and phone/TDD, while a third individual reported experiences with other, phone/TDD, and web conferencing. The qualitative analysis required

several steps. First, the entire answer was read. Holistic coding of the basic theme utilized the COI a priori codes and classification indicators from Garrison (2011), which have developed over a decade of COI qualitative studies and were still in practice (COI, 2017). Appendix N provides Garrisons (2011) categorizations and a priori codes. Organization of a-priori codes and classification indicators fell under the three elements of social presence, cognitive presence, and teaching presence, as well as their categories. The survey items also provided a reference for coding comments, as participants utilized similar wording in their comments.

Second, directional coding sorted comments as positive (for example feelings of camaraderie, enjoyment, sense of connection or success) or negative (for example issues, problems, frustration, recommending changes) statements. Participant comments were assigned to multiple categories if applicable. Coding journals captured any notes on decisions, including the assessment of two participants who claimed *no technology* but because they mentioned email in the open-ended comments they were reassigned to the category of *other*. A similar situation was assessed where a participant selected *other* and commented on *phone*, so they were reassigned to the *phone* category, which was more appropriate for analysis. For internal validity, a peer also coded the responses to question 10. Peer coders compared coding categories for each answer. The peer coders found immediate agreement with 19 of 26 coded comments. They found 100% agreement on the directional coding for 26 comments (positive or negative). The remaining seven categorical coding differences were resolved through discussion.

Chapter Summary

In summary, this chapter included three research questions, the mixed methods recruitment strategy, and survey research design. The population section introduced the higher education institution, the online program, and academic advising model. Additional sections

included an introduction to the sample of participants and the protection of human subject research section. In the survey section, a brief history of measuring COI qualitatively and quantitatively was discussed, as well as research literature, which set a precedent for survey item modifications and importance rankings. Finally, adding demographic and open-ended questions concluded the survey section. Procedures included cognitive interviews, data collection methods, selecting and contacting the participants, and administering the survey. Additional sections included the selection and contacting of the sample, the process of administering the survey, and discussion of the reliability and validity of the COI survey. Lastly, data analysis for each of the three research questions and open-ended comments were discussed and outlined.

Chapter Four – Findings

Chapter four findings include a description of participants and data analysis for research questions one, two, and three. For research question one and three, findings are organized by presence, their categories, and individual items. For example in RQ1.a, teaching presence findings are organized by the three categories of direct instruction, facilitation, and design and organization, measured by 13 items. Table 8 below provides an organizational device for the list of categories, and how categories are organized within each presence. Research question two illustrates overall COI and discusses presence scores with boxplots. Finally, the coding of open-ended comments was discussed.

Table 8

Organization of categories within each presence

Theoretical Framework	Element	Categories
Community of Inquiry	Teaching Presence	
		Design and Organization
		Facilitation
		Direct Instruction
	Social Presence	
		Affective Expression
		Open Communication
		Group Cohesion
	Cognitive Presence	
		Triggering Event
		Exploring
		Integration
		Resolution

Demographics

The sample consisted of a majority of females (n = 62, 71.3%), whites (n = 54, 62.1%) and 25 to 34-year-olds (n = 33, 37.9%), which mirrored the majorities in the population for

Spring term one, 2018 (females = 79.3%, whites = 74.5%, 25 to 34-year-olds 48%) in degree seeking undergraduate students enrolled online. Appendix P illustrates the sample participants' personal variables.

RQ 1 Data Analysis – Technology Preference and Academic Advising COI

1. Is there a relationship between COI scores based on preferred advising appointment technology, as measured by the COI instrument mean score?

    Ho = p = 0

    Ha = p ≠ 0

    h. Teaching Presence

    i. Cognitive presence

    j. Social Presence

    k. COI framework

No, there were no significant relationships between COI scores based on preference for advising technology. Finding no significant difference when comparing COI and both technologies is preferred, as this suggests that students perceived their advising experiences as conducted equally through current communication technologies. Although not statistically significant, of interest and unique to COI research, social presence scored highest of the three presences. The heightened perception of social presence within the context of online academic advising suggested that advisors provided support for quality interactions and inquiry. Highest scoring items trended towards informational or least complex, while lowest scoring items were developmental and more complex (refer to Table 1 for the advising-counseling responsibility continuum for informational and developmental responsibilities). Teaching presence ranked second, and cognitive presence ranked third. Those who preferred phone/TDD reported higher

COI, teaching presence, social presence, and cognitive presence scores when compared to all participants, or those who preferred web conferencing, based on overall mean scores. The question of relationship between the academic advising COI scores included examination across the technology response choices. Appendix Q has the data tables for research question one.

The academic advising COI scores ($N = 85$) were examined through two response options: phone/TDD ($n = 43$) and web conferencing ($n = 25$). Throughout this chapter, the academic advising COI cumulative mean scores are hereinafter referred to as *COI*, those who preferred phone/TDD are hereinafter referred to as *phone/TDD*, and those who preferred web conferencing are hereinafter referred to as *web conferencing*. If phone/TDD and web conferencing agreed then hereinafter they will be referred to as *both technologies.* Although each category is organized by a discussion of highest and lowest mean scores, the overall range of mean scores is small, in relation to the five-point Likert scale. Items ranked by COI had means ranging from 4.49 to 3.35 (difference of 1.14), phone/TDD means ranged from 4.58 to 3.49 (difference of 1.09), and web conferencing means ranged from 4.40 to 3.12 (difference of 1.28). All item means scored above the Likert rating of 3 (*neutral*).

RQ 1.a Teaching presence. Teaching presence represented both the intrapersonal and knowledge (responsibilities, pedagogy, and theory) components of academic advising. For example, COI and both technologies agreed the highest item mean was item 13, *the academic advisor responded in a timely fashion*. Responding in a timely fashion is a critical responsibility of academic advisors. COI and both technologies ranked design and organization first, direct instruction second, and facilitation third. Although the majority of effect sizes calculated between phone/TDD and COI, phone and web conferencing, and web conferencing and COI, were large ($\geq$.80, refer to Appendix Q), none were found to be significant, which was desirable.

Differences existed between perception of COI through phone/TDD and web conferencing, but both technologies provided access to online advisors and those experiences built the perception of a community of inquiry within academic advising. Teaching presence scores included 13 items organized under three categories: design and organization, facilitation, and direct instruction.

Design and organization. Participants agreed in perceiving a critical function of advising. However, they agreed less on a more complex advising task, learning how to participate in activities, which required additional learning resources and time. COI and both technologies agreed on the highest and lowest item. The highest mean score for COI, and both technologies was item four, which was *the academic advisor communicated important due dates/time frames clearly* ($n_{coi} = 80$, $M_{coi} = 4.4$, $s_{coi} = .875$; $n_p = 43$, $M_p = 4.49$, $s_p = .733$; $n_w = 25$, $M_w = 4.28$, $s_w = 1.08$). The lowest mean score for COI, and both technologies was item three: *the academic advisor provided clear instructions on how to participate in academic success learning activities*, ($n_{coi} = 80$, $M_{coi} = 3.94$, $s_{coi} = 1.11$; $n_p = 43$, $M_p = 4.07$, $s_p = .983$; $n_w = 25$, $M_w = 3.56$, $s_w = 1.08$). Lack of clear instructions on how to participate in learning activities may raise concerns focused on staff training (knowledge of resources, or how to interpret findings) or student access to learning activities. Additionally, this answer may reflect the priorities and mission of the department, or workload versus adequate time to delve into more developmental or complex activities. Table Q1 illustrates data for COI overall, phone/TDD preference, web conferencing preference, and Cohen's effect size.

Facilitation. Basic advising skills, such as clarification and keeping students on task, found agreement amongst COI and both technologies, but there was less agreement on more complex issues like an advisor helping develop a student's sense of an online community. COI

and phone agreed on highest and lowest items. The highest mean score for COI and phone was item six, *the academic advisor assisted in guiding me towards understanding academic success in a way that helped me clarify my thinking* (n_{coi} = 80, M_{coi} = 4.05, s_{coi} = 1.05; n_p = 43, M_p = 4.19, s_p = .980). Phone had a tie for highest, with item 10, *academic advisor actions reinforcing the development of a sense of community within the online campus* (n = 43, M = 4.19, s = .844). However, the highest for web conferencing preference was item eight, *the academic advisor kept me on task in a way that helped me to learn* (n = 25, M = 3.84, s = 1.13).

The lowest mean score for COI and phone was item five, *the academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn* (n_{coi} = 80, M_{coi} = 3.84, s_{coi} = 1.05; n_p = 43, M_p = 3.86, s_p = 1.03). Didactic ideas could develop into more complex perspectives as an advisor shifts from informational to developmental methods on advising-counseling continuum. The lowest mean for web conferencing was item 10: *academic advisor actions reinforced the development of a sense of community within the online campus* (n = 25, M = 3.52, s =1.28). Table Q2 illustrates scores for COI, phone/TDD, web conferencing, and effect size.

Initial analysis revealed item 10, *the academic advisor actions reinforced the development of a sense of community within the online campus* (U = 369, z = 2.14), had a p-value of .03. The p-value (.03) was smaller than the 0.05 confidence level used for this research, resulting in the rejection of the null hypothesis. Therefore, there was a difference for item 10 in COI scores based on a preference for phone or web conferencing. The effect size between phone (n = 43, M = 4.19, Mdn = 4, s = .844) and web conferencing (n = 25, M = 3.52, Mdn = 4, s= 1.28) was large at ES = 3.58. However, further analysis revealed the participant who reported dissatisfied across all 34 items preferred web conferencing, but never experienced web

conferencing. When this one outlier score was removed from those who preferred web conferencing in item 10, the effect size dropped from 3.58 (found to be significant) to 2.08, found not significant, and failed to reject the null hypothesis.

Direct instruction. COI and both technologies agreed on the highest and lowest item. The highest mean score for COI and both technologies was item 13, *the academic advisor responded in a timely fashion* (n_{coi} = 80, M_{coi} = 4.49, s_{coi} = .758; n_p = 43, M_p = 4.58, s_p = .662; n_w = 25, M_w = 4.40, s_w = .899). The lowest mean score for COI and both technologies was item 12, *the academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives* (n_{coi} = 79, M_{coi} = 3.94, s_{coi} = 1.08; n_p = 43, M_p = 4.00, s_p = 1.06; n_w = 25, M_w = 3.60, s_w = 1.18). Table Q3 illustrates data for COI overall, phone/TDD preference, web conferencing preference, and Cohen's effect size.

Teaching presence overall. Those who preferred phone/TDD had a greater perception of teaching presence and its categories than COI or web conferencing, based on overall mean scores. COI, phone/TDD, and web conferencing agreed in rank for all teaching presence categories and agreed in highest item. They ranked the design and organization category first, the direct instruction category second, and the facilitation category third. All the category effect sizes were large. Table 7 illustrates data for COI overall, phone/TDD preference, web conferencing preference, and Cohen's effect size.

Table 9

RQ 1.a Technology Preference and Teaching Presence Summary

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*			
Design and Organization	80	4.18	.962	43	4.28	.878	25	3.97	1.15	.859	-1.42	1.76
Facilitation	80	3.95	1.02	43	4.08	.956	25	3.69	1.20	1.02	-1.72	2.12
Direct Instruction	80	4.14	.932	43	4.23	.890	25	3.92	1.04	.813	-1.60	1.88
Teaching Presence	80	4.06	.984	43	4.18	.918	25	3.83	1.15	.928	-1.60	1.96

In an examination of all teaching presence items (n = 13), COI and both technologies agreed on the highest item, while COI and phone agreed on the lowest item. The highest item for COI, and both technologies was item 13, *the academic advisor responded in a timely fashion*. The lowest item for COI and phone was item five, *the academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn*. Web conferencing agreed somewhat and ranked item five second to last out of 13 items. However, the lowest mean for those who reported a preference for web conferencing was item 10, *academic advisor actions reinforced the development of a sense of community within the online campus*, also under the facilitation category.

RQ 1.b Social presence. The highest item for COI, and both technologies was item 17, *I felt comfortable conversing through the online medium*. COI and both technologies also agreed that open communication ranked first. Group cohesion ranked second, and affective expression

ranked last for COI and web conferencing. Phone/TDD flipped the order and found affective expression to be second, and the group cohesion category to be last. Of the 27 effect scores calculated most of the effect sizes were large (≥.80, refer to Appendix Q). Social presence scores included nine items organized under three categories: affective expression, open communication, and group communication.

Affective expression. There was agreement for the lowest item across COI and both technologies. Highest mean item agreed between COI and web conferencing but differed with phone/TDD. The highest mean score for COI and web conferencing was item 16, *online or web-based communication was an excellent medium for social interactio*n (n_{coi} = 85, M_{coi} = 4.07, s_{coi} = .918; n_w = 25, M_w = 3.96, s_w = 1.04). However, the highest item for phone/TDD was item 15: *I formed distinct impressions about my academic advisor* (n = 43, M = 4.26, s = .778). The lowest mean score for COI and both technologies was item 14*, I have gotten to know my academic advisor, adding to my sense of belonging in online campus* (n_{coi} = 85, M_{coi} = 3.92, s_{coi} = 1.08; n_p = 43, M_p = 4.16, s_p = .994; n_w = 25, M_w = 3.60, s_w = 1.21). Table Q4 illustrates data for COI overall, phone/TDD preference, web conferencing preference, and Cohen's effect size.

Open communication. COI and both technology preferences concurred in their rank of highest and lowest items in open communications. The highest mean score for COI and both technologies was item 17*, I felt comfortable conversing through the online medium* (n_{coi} = 85, M_{coi} = 4.40, s_{coi} = .843; n_p = 43, M_p = 4.56, s_p = .677; n_w = 25, M_w = 4.24, s_w = 1.00). The lowest mean score for COI and both technologies was item 18, *I felt comfortable participating in academic success discussions* (n_{coi} = 85, M_{coi} = 4.18, s_{coi} = .897; n_p = 43, M_p = 4.35, s_p = .793; n_w = 25, M_w = 3.96, s_w = 1.06). Table Q5 illustrates data for COI overall, phone/TDD preference, preference, and Cohen's effect size.

Group cohesion. The highest mean item agreed between phone/TDD and COI but differed with web conferencing. There was agreement for the lowest item across COI and both technologies. The highest mean score for COI and phone/TDD was item 21: *the academic advisor communicated important academic success goals clearly* ($n_{coi} = 85$, $M_{coi} = 4.18$, $s_{coi} = .935$; $n_p = 43$, $M_p = 4.33$, $s_p = .784$). However, item 22, *the academic advisor provided clear instructions on how to participate in academic success learning activities,* was the highest mean for web conferencing ($n = 25$, $M = 4.04$, $s = 1.18$). The lowest mean score for COI and both technologies was item 20, *the academic advisor communicated important academic success strategies clearly* ($n_{coi} = 85$, $M_{coi} = 3.82$, $s_{coi} = .923$; $n_p = 43$, $M_p = 3.93$, $s_p = .853$; $n_w = 25$, $M_w = 3.68$, $s_w = 1.17$). Table Q6 illustrates data for COI overall, phone/TDD preference, web conferencing preference, and Cohen's effect size measuring the difference of means.

Social presence overall. Those who preferred phone/TDD had a greater perception of social presence than COI or web conferencing, based on overall mean scores. There was agreement for both technologies and COI for the highest category, and highest item. In an examination of categories, open communication ranked first across COI, phone/TDD, and web conferencing. However, the second and third ranked categories differed. The group cohesion category ranked second for COI and web conferencing (phone ranked third), while affective expression ranked third. Social presence included three categories: affective expression, open communication, and group cohesion. Table 8 illustrated the element of social presence and category data for COI overall, phone/TDD preference, web conferencing preference, and Cohen's effect size.

Table 10

RQ 1.b Technology Preference and Social Presence Summary

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*			
Affective Expression	85	4.01	.986	43	4.22	.869	25	3.81	1.13	1.77	-1.39	2.34
Open Communication	85	4.31	.890	43	4.47	.761	25	4.12	1.02	1.61	-1.44	2.29
Group Cohesion	85	4.03	.948	43	4.14	.853	25	3.91	1.18	.995	-.839	1.32
Social Presence	85	4.12	.942	43	4.28	.829	25	3.95	1.11	1.46	-1.21	1.97

In an examination of all social presence items (n = 12) the highest item mean for COI, and both technologies was item 17, *I felt comfortable conversing through the online medium*. The lowest item for COI and phone was item 20, *the academic advisor communicated important academic success strategies clearly*. Web conferencing somewhat concurred, ranking item 20 as second lowest. However, item 14 was the lowest mean for web conferencing, *I have gotten to know my academic advisor, adding to my sense of belonging in online campus.*

RQ 1.c Cognitive presence. Cognitive presence scores included 12 statements organized under four categories: triggering event, exploration, integration, and resolution. There was some agreement on highest items across groups, and phone had a four-way tie for highest item. COI and both technologies agreed on the lowest item in cognitive presence. Ranking of categories across COI, phone/TDD, and web conferencing preference revealed that the exploration category ranked first and the resolution category ranked last (refer to Table 9). The majority of effect sizes were large ($\geq$.80, refer to Appendix Q).

Triggering event. COI and both technology preferences concurred in their rank of highest and lowest items in the triggering event category. The highest mean score for COI and both technologies was item 25, *I was motivated to explore resources suggested by my academic advisor* (n_{coi} = 84, M_{coi} = 3.92, s_{coi} = 1.05; n_p = 43, M_p = 3.98, s_p = 1.00; n_w = 25, M_w = 3.92, s_w = 1.09). The lowest mean score for COI and both technologies was item 24, *academic success activities engaged my curiosity* (n_{coi} = 84, M_{coi} = 3.70, s_{coi} = .985; n_p = 43, M_p = 3.88, s_p = .986; n_w = 25, M_w = 3.48, s_w = 1.09). Table Q7 illustrated data for COI overall, phone/TDD preference, web conferencing preference, and Cohen's effect size.

Exploration. There was some overlap in agreement on highest item and total agreement on lowest item across COI and both technologies for the exploration category. Web conferencing had a tie for the highest mean of 3.88, and each item matched either the highest score for phone/TDD, or the highest score of COI. First the highest mean score for COI and web conferencing was item 28, *advising discussions were valuable in helping me appreciate different perspectives* (n_{coi} = 83, M_{coi} = 3.89, s_{coi} = 1.06; n_w = 25, M_w = 3.88, s_w = 1.03). Second, the highest mean for phone/TDD and web conferencing was item 27, *exploring relevant information helped me resolve advising related questions* (n_p = 43, M_p = 4.02, s_p = .915; n_w = 25, M_w = 3.88, s_w = .909). The lowest mean score COI and both technologies was item 26, *I utilized a variety of information sources to explore questions posed by my academic advisor* (n_{coi} = 84, M_{coi} = 3.80, s_{coi} = .985; n_p = 43, M_p = 3.91, s_p = 1.04; n_w = 25, M_w = 3.80, s_w = .894). Table Q8 illustrates scores for COI, phone/TDD, web conferencing, and effect size.

Integration. COI and both technology preferences concurred in their rank of highest and there was some agreement for lowest items in the integration category. The highest mean score for COI and both technologies was item 31, *reflecting about academic advising discussions*

helped me understand fundamental concepts for my academic success (n_{coi} = 84, M_{coi} = 3.95, s_{coi} = .937; n_p = 43, M_p = 4.02, s_p = .955; n_w = 25, M_w = 3.84, s_w = 1.01). The lowest mean score for COI and web conferencing, and second lowest for phone/TDD was item 30, *academic success activities helped me construct explanations and solutions* (n_{coi} = 85, M_{coi} = 3.74, s_{coi} = .989; n_w = 25, M_w = 3.44, s_w = 1.10). However, the lowest mean for those with a preference for phone/TDD was item 29, *integrating new information helped me answer questions raised by my academic advisor* (n = 43, M = 3.91, s = 1.01). Table Q9 illustrates scores for COI, phone/TDD, web conferencing, and effect size.

Resolution. There was some overlap in agreement between COI, phone/TDD and web conferencing on highest item, and total agreement on lowest item within the resolution category. Phone/TDD has a tie for the highest mean score of 4.02, and each item matched either the highest score for web conferencing, or the highest score of COI. The highest mean score for COI and phone/TDD was item 33, *I developed solutions to academic success problems that can be applied in practice solutions* (n_{coi} = 84, M_{coi} = 3.86, s_{coi} = 1.05; n_p = 43, M_p = 4.02, s_p = .966. Item 32, *I evaluated the applicability of solutions learned through academic advising,* was the highest item for phone and web conferencing (n_p = 43, M_p = 4.02, s_p = .872; n_w = 25, M_w = 3.56 s_w = 1.09) . The lowest mean score for COI and both technologies was item 34*, I applied strategies learned through academic advising to my work or other non-class related activities* (n_{coi} = 84, M_{coi} = 3.35, s_{coi} = 1.04; n_p = 43, M_p = 3.49, s_p = 1.05; n_w = 25, M_w = 3.12, s_w = 1.13). Table Q10 illustrates scores for COI, phone/TDD, web conferencing, and effect size.

Cognitive presence overall. Those who preferred phone/TDD had a greater perception of cognitive presence than COI or web conferencing, based on overall mean scores. There was agreement for both technologies and COI for the highest and lowest category. Phone/TDD tied for highest category mean of 3.95, between integration and exploration. Exploration was ranked first by COI, and web conferencing. Integration was ranked second by COI and ranked third with those who preferred web conferencing. All agreed that the resolution category ranked last. Cognitive presence was scored using 12 items organized under four categories: triggering event, exploration, integration, and resolution. Table 9 illustrated data for COI overall, phone/TDD preference, web conferencing preference, and Cohen's effect size.

Table 11

RQ 1.c Technology Preference and Cognitive Presence Summary

Category and items	*n*	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*	Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
Triggering Event	84	3.81	1.00	43	3.92	.984	25	3.73	1.50	.906	-.547	1.08
Exploration	84	3.85	.996	43	3.95	.988	25	3.85	.947	.810	.006	.604
Integration	84	3.83	.980	43	3.95	.972	25	3.64	1.06	1.05	-1.34	1.80
Resolution	84	3.67	1.03	43	3.84	.967	25	3.40	1.16	1.36	-1.85	2.43
Cognitive Presence	84	3.79	1.00	43	3.92	.978	25	3.66	1.06	1.03	-.954	1.50

A review of the 12 items measuring cognitive presence revealed that the lowest item means for COI and both technologies was item 34, *I applied strategies learned through academic advising to my work or other non-class related activities*. The highest item for COI, and phone/TDD (four-way tie) was item 31, *reflecting about academic advising discussions helped me understand fundamental concepts for my academic success*. Phone/TDD reported a

four-way tie for highest item mean of 4.02. The remaining three items included item 27, *exploring relevant information helped me resolve advising related questions*, as well as item 32, *I evaluated the applicability of solutions learned through academic advising,* and finally item 33, *I developed solutions to academic success problems that can be applied in practice.*

RQ 1.d COI Overall and technology preference. Online students perceived COI in online academic advising. Those who preferred phone/TDD perceived a greater presence across all three elements and categories. The three elements agreed in rank for COI, and both technologies. Social presence scored highest of the three presences (n = 85, M = 4.12, s = .94), followed by teaching presence (n = 80, M = 4.06, s = .983), and cognitive presence (n = 84, M = 3.79, s = 1). Teaching presence was ranked second, and cognitive presence was ranked third for COI and both technologies. Effect sizes were all large (refer to Table 10).

Phone/TDD. Those who preferred phone/TDD perceived a greater presence across all three elements and categories than COI or web conferencing, as measured by mean scores. All the elements and categories had a Cohen's effect size above .80, which was considered large. As the last table in the technology preference section, Table 10 includes the COI, phone, and web conferencing category and element scores for number, mean, standard deviation, and effect size.

Web conferencing. Web conferencing had the lowest mean score across all elements, and nine of 10 categories. Only the exploration category (under cognitive presence) tied with COI, and the effect size had almost no measurable mean difference (ES=.006). Of 34 COI items, only four items for web conferencing were tied, or had means within .01 for COI. All four items fell under cognitive presence. Item 25, I was motivated to explore resources suggested by my academic advisor, tied with COI. Item t26, I utilized a variety of information sources to explore questions posed by my academic advisor, tied with COI. Item 28, advising discussions were

valuable in helping me appreciate different perspectives, differed in mean by +.01 over COI). Item 23, questions posed increased my interest in academic success strategies, differed in mean by +.01 over COI.

Table 12

RQ 1. Hypothesis summary: Phone versus Web conferencing presence

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs Web Effect Size	Ho	Ho Action
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*			
Design and Organization	80	4.18	.962	43	4.28	.878	25	3.97	1.06	1.85	1.a.1	Failed to reject
Facilitation	80	3.95	1.02	43	4.08	.956	25	3.69	1.20	2.12	1.a.2	Failed
Direct Instruction	80	4.14	.932	43	4.23	.890	25	3.92	1.04	1.88	1.a.3	Failed
Teaching Presence	80	4.06	.984	43	4.17	.918	25	3.82	1.24	1.99	1.a	Failed
Triggering Event	84	3.81	1.00	43	3.92	.984	25	3.73	1.05	1.08	1.b.1	Failed
Exploration	84	3.85	.996	43	3.95	.988	25	3.85	.947	.604	1.b.2	Failed
Integration	84	3.83	.980	43	3.95	.972	25	3.64	1.06	1.80	1.b.3	Failed
Resolution	84	3.67	1.03	43	3.84	.967	25	3.40	1.16	2.43	1.b.4	Failed
Cognitive Presence	84	3.79	1.00	43	3.92	.978	25	3.65	1.06	1.50	1.b	Failed
Affective Expression	85	4.01	.986	43	4.22	.869	25	3.81	1.13	1.54	1.c.1	Failed
Open Communication	85	4.31	.890	43	4.47	.761	25	4.12	1.02	2.29	1.c.2	Failed
Group Cohesion	85	4.03	.948	43	4.14	.853	25	3.91	1.18	1.32	1.c.3	Failed
Social Presence	85	4.12	.942	43	4.28	.829	25	3.95	1.11	2.14	1.c	Failed
COI Overall	85	3.98	.979	43	4.11	.917	25	3.80	1.10	1.81	1.	Failed

Note: *n* = number of responses, *M* = Mean, *s* = Standard Deviation, Cohen's Effect Size of magnitude of difference in means: small .20, medium .50, large .80

Summary of RQ1. Online students perceived COI in online academic advising. Preference for appointment technology was not found to produce a significant difference in

perception of COI, across 34 items, suggesting that students perceived COI in advising experiences despite the technology used. Tables Q11, Q12 and Q13 include the calculated Mann-Whitney *U* values, *z* score, and *p*-value for each of the 34 items, sorted by presence. Unique to COI research, social presence scored highest of the three presences ($n = 85$, $M = 4.12$, $s = .94$), followed by teaching presence ($n = 80$, $M = 4.06$, s = .983), and cognitive presence ($n = 84$, $M = 3.79$, $s = 1$). Agreement occurred across the three presences in rank, their highest and lowest categories, and items. Tables Q14 and Q15 illustrate the items in rank order for COI, phone and web conferencing.

RQ 2 Data Analysis – Descriptive Characteristics and Academic Advising COI

2. Is there a relationship in scores of COI and its elements (teaching, cognitive, social) based on demographic characteristics, as measured by the COI instrument mean score?

   Ho = p = 0

   Ha = $p \neq 0$

   a. Gender
   b. Ethnicity and Race
   c. Age
   d. Number of courses successfully completed towards degree
   e. Number of courses successfully completed online at other institutions
   f. Number of courses successfully complete online at institution
   g. Online start date at institution (term and year)

There were no significant differences found. An examination of descriptive characteristics revealed complimentary and new information with regards to COI. Boxplots helped make comparative judgments, and showed marked variability within each level of variables, as well as

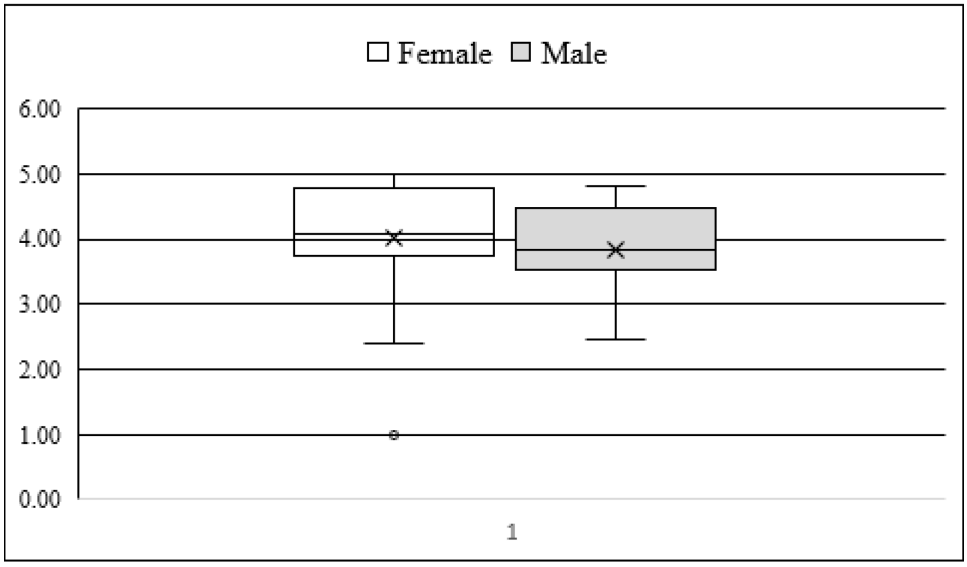
illustrated any overlap in scores across variables and levels (i.e. summary statistics and distribution of the primary data). Appendix R includes all supplemental tables for research question two.

RQ 2.a Gender. There were 62 female participants ($M = 4.01$, $s = .812$) and 10 male participants who answered the COI items ($M = 3.85$, $s = .646$). Fifteen participants chose to not answer this question. Table R1 illustrates sample size, mean, and standard deviation data, while Table R2 reports the Mann Whitney results.

Females had higher means across all three presences and COI. Gender differed in the highest rank. Males ranked teaching presence first ($n = 10$, $M = 3.95$, $s = .750$), while females ranked social presence ($n = 62$, $M = 4.18$, $s = .762$) as first. Gender agreed that cognitive presence is the lowest. Figure 9 illustrates the gender COI scores using boxplots. Samples sizes were small, so a boxplot was used to illustrate relationship.

Figure 9

Boxplot for Gender and COI scores

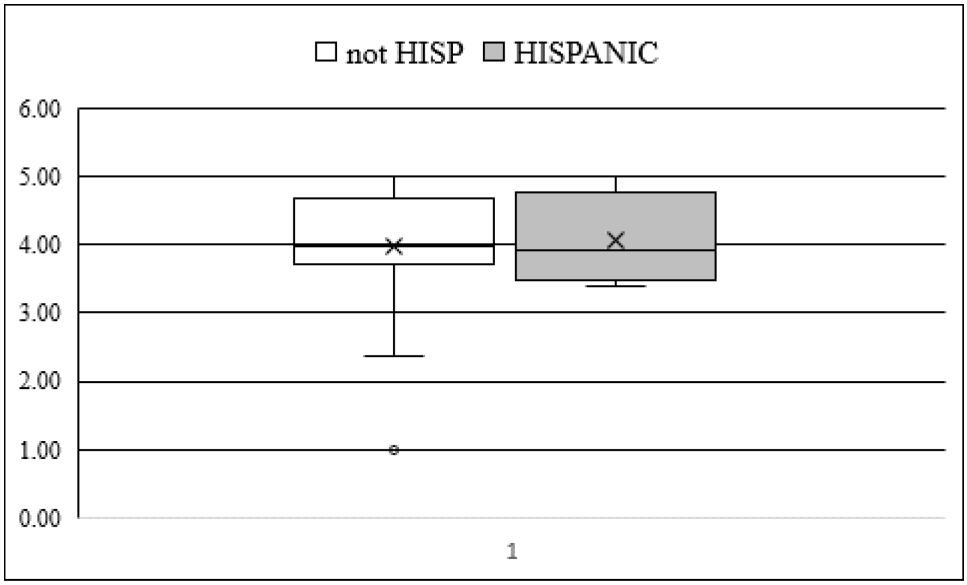


RQ 2.b.1 Ethnicity. Four participants answered "yes, Hispanic or Latino" (hereinafter, yes), and 68 participants answered "no, not Hispanic or Latino" (hereinafter, no). Fifteen participants chose to not answer this question. Table R3 illustrates sample size, mean, and standard deviation data for ethnicity, while Table R4 reports the Mann Whitney results. There was no significant difference in mean for those who answered yes or no for COI or presence.

Participants who selected "no," had higher means for COI, teaching presence, and social presence. Participants who selected "yes," had a higher mean score for cognitive presence. There was agreement between both groups in rank of category, with social presence ranked first, teaching presence ranked second, and cognitive presence ranked third. Figure 10 illustrates the ethnicity COI scores using boxplots. Samples sizes were low, so a boxplot was used to illustrate relationship.

Figure 10

Boxplot for ethnicity and COI



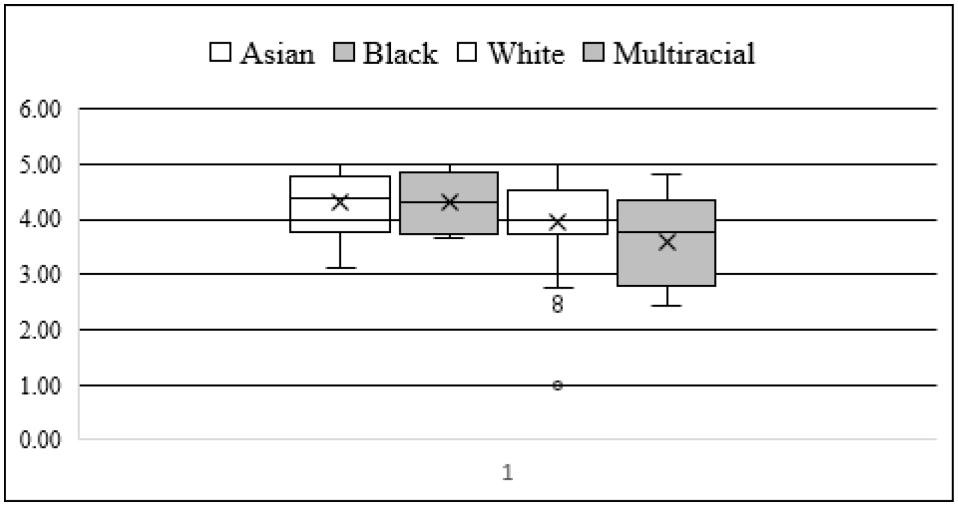
RQ 2.b.2 Race. Five levels for race, and one mixed-race category, were analyzed for differences between means for COI, teaching presence, social presence, and cognitive presence. The choices for race were American Indian or Alaskan Native (n = 1), Asian (n = 7), Black or African American (n = 4), Native Hawaiian or other Pacific Islander (n = 0), White (n = 54), and a sixth category of multi-race (n = 5) emerged when participants selected more than one race. Sixteen participants chose to not answer this question. Table R5 illustrates sample size, mean, and standard deviation data for race, while Table R6 reports the Kruskal Wallis results.

Overall, social presence scored as the highest mean for almost all race categories: Asian, Black or African American (tied with teaching presence), White, and multi-racial. The exception was the American Indian or Alaskan Native participant who ranked teaching presence first, with social presence as second. The lowest score or mean for all race categories was cognitive presence. As illustrated in the boxplots in Figure 11, the COI overall score was highest for Black or African Americans (n = 4, M = 4.32, s = .601), tied second for a mean of 4.30 for the American Indian or Alaskan Native (n = 1, therefore not included in boxplot in figure 11), and Asian (n = 7, s = .618) race categories. Whites had the second lowest in overall COI mean at 3.96 (n = 54, s = .808), while the lowest mean COI score was for multi-racial participants (n = 5, M = 3.61, s = .797).

Since there was only one response for American Indian or Alaskan Native, the specific scores were reported with no standard deviation for teaching presence (5.00), social presence (4.67), cognitive presence (4.50), and overall COI (4.30).

Figure 11

Boxplot for Race and COI



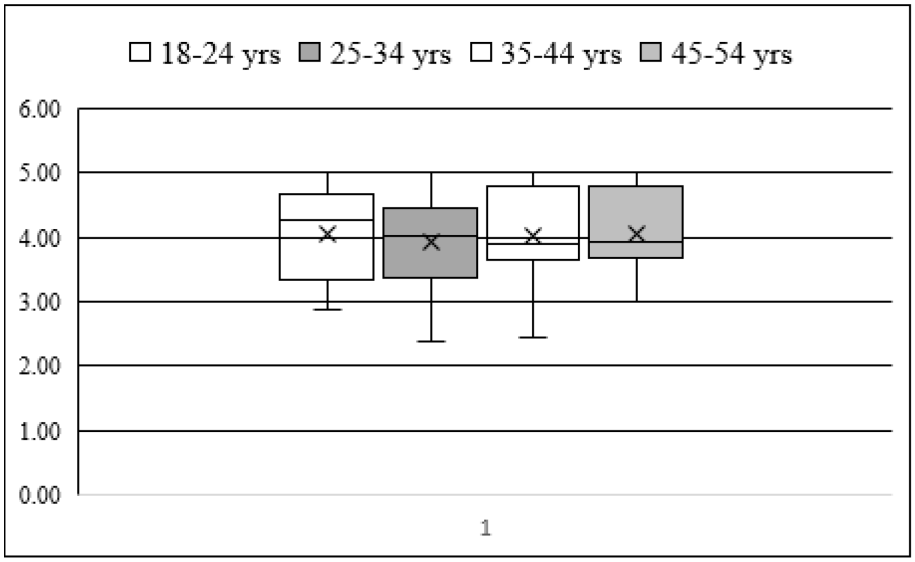
RQ 2.c Age. There were five age brackets analyzed for differences between means for COI, teaching presence, social presence, and cognitive presence. All participants (n = 87) answered the age question, as it was required. The remaining choices for age were category responses of 18 to 24, 25 to 34, 35 to 44, 45 to 54, and greater than or equal to 55.

Social presence was the highest element mean across age brackets ranging from 18 to 44 years. Forty-five to 44-year-olds highest mean was teaching presence, while all other age groups ranked teaching presence second. For teaching presence, the scores increased as age increased from younger to older. Cognitive presence was the lowest element mean across age brackets ranging from 18 to 54. Figure 12 illustrates the age brackets and COI scores using boxplots. The COI overall score was highest for the age bracket 45 to 54 (n = 12, M = 4.06, s = .659), followed by the brackets of 18 to 24 (n = 15, M = 4.05, s = .663), 35 to 44 (n = 27, M = 4.03, s = .785), and 25 to 34 (n = 32, M = 3.92, s = .707). Table R7 illustrated sample size, mean, and standard deviation data for age, while Table R8 reported the Kruskal Wallis results.

Since there was only one response for the bracket of greater than or equal to 55, specific scores were reported, with no standard deviation, for teaching presence (1.00), social presence (1.67), cognitive presence (1.50), and overall COI (1.00).

Figure 12

Boxplot for age and COI

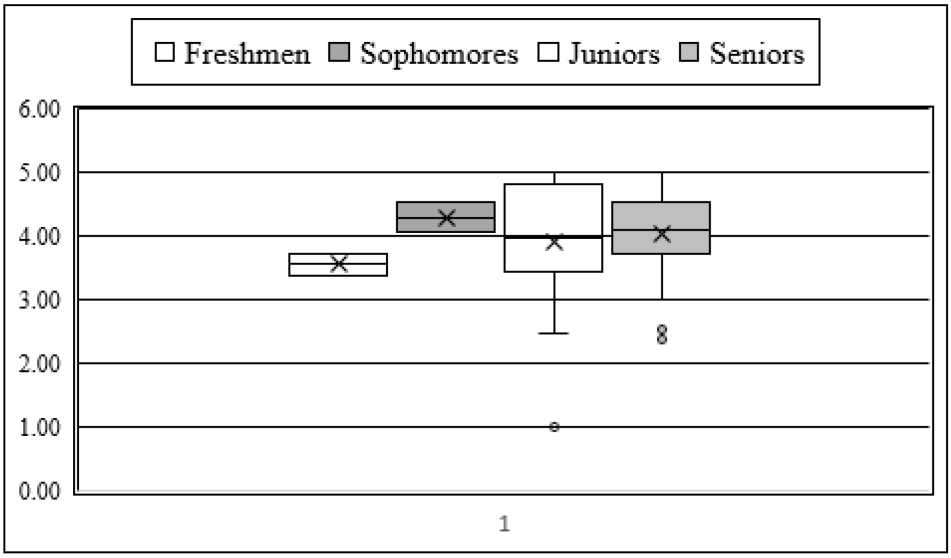


RQ 2.d Courses completed towards degree. Social presence was the highest element mean across freshmen, juniors, and seniors. Teaching presence was the highest element mean for the sophomores. Cognitive presence was the lowest element mean across all classifications. There was a predictable pattern for classifications and mean scores (how they perceived presence): sophomores scored highest, followed by seniors, juniors, and freshmen were the lowest. The slight deviation from this was social presence where seniors and juniors tied for second, remaining their order between sophomores (first) and freshmen (last). Figure 13 illustrates the classification COI scores using boxplots. The COI overall score was highest for the sophomores ($n = 2$, $M = 4.30$, $s = .236$), followed by the seniors ($n = 39$, $M = 4.03$, $s = .714$),

junior (n = 30, M = 3.92, s = .922), and freshmen (n = 2, M = 3.56, s = .176). Table R9 illustrated sample size, mean, and standard deviation data for courses completed towards degree, while Table R10 reported the Mann Whitney results between juniors and seniors.

Figure 13

Boxplot for classification and COI



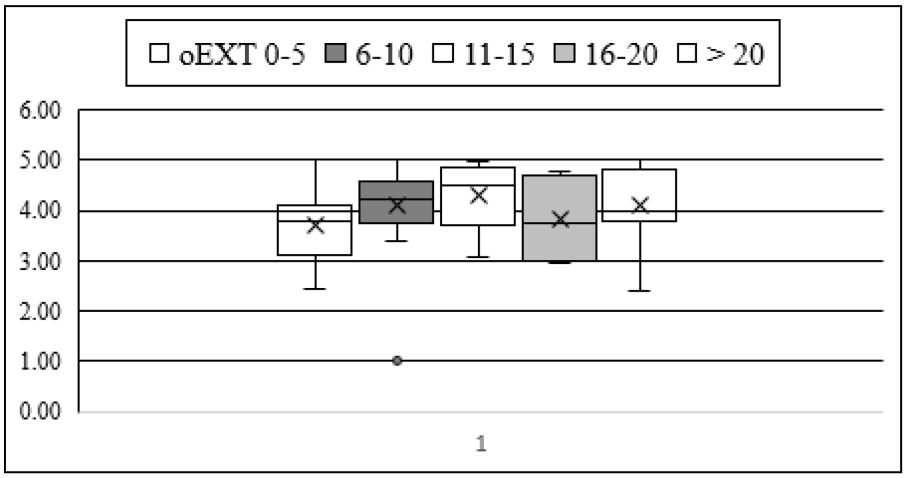
There were four classification brackets analyzed for differences between means for COI, teaching presence, social presence, and cognitive presence. The four classifications included the number of course hours to help define the appropriate classification for participants. Freshmen (0-29 hours), sophomore (30-59 hours), junior (60-89 hours), and senior (90+ hours) were the classification brackets. There were fourteen non-responses.

RQ 2.e Online experience: at other institutions. There was no pattern to COI scores, but those who had 11 to 15 courses completed successfully at other institutions scored the highest across COI and all presences. Social presence scored the highest, teaching presence second, and cognitive presence third for age brackets, except the 11 to 15 group. The 11 to 15

courses group at other institutions ranked cognitive presence first, the only demographic to do so. Teaching and social presence tied for second with the same group. For social presence, the means scores increase with online experience. The social presence highest mean was greater than 20 courses (n = 19, M = 4.30, s = .631), followed by sixteen to twenty courses (n = 4, M = 4.28, s = .601), 11 to 15 courses (n = 6, M = 4.24, s = .627), six to ten courses (n = 22, M = 4.22. s = .844), and zero to five courses (n = 23, M = 3.83, s = .756). There were five online experiences at other institution (as measured by courses) brackets analyzed for differences between means for COI, teaching presence, social presence, and cognitive presence. The five brackets included zero to five courses (n = 23), six to ten courses (n = 22), eleven to fifteen courses (n = 6), sixteen to twenty courses (n = 4), and greater than twenty courses (n = 19). There were thirteen non-responses. Table R11 illustrated sample size, mean, and standard deviation data for online experience at other institutions, while Table R12 reported the Kruskal Wallis results.

Figure 14

Boxplot for online courses successfully completed at other institutions and COI

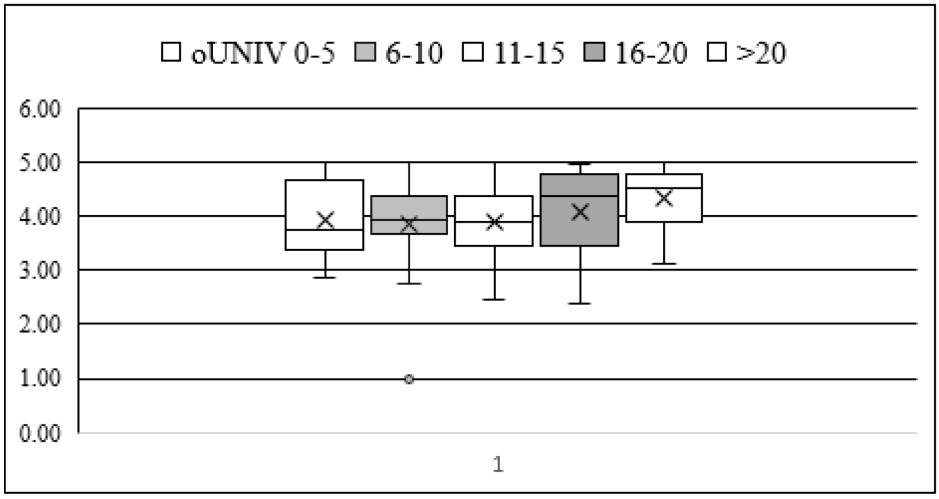


Note: oEXT is shorthand for online external courses.

RQ 2.f Online experience: at the researched institution. Teaching presence was highest for those who had taken 11 to 15, or 16 to 20 courses at the institution. Social presence was the highest element mean zero to five (n = 12, M = 4.02, s = .713), and greater than 20 courses (n = 9, M = 4.53, s = .597). Cognitive presence was the lowest element mean for all brackets. For social presence the means mostly increased with online experience. Means for cognitive presence, from highest to lowest, were mostly in order from a higher number of online courses to lower. Table R13 illustrated sample size, mean, and standard deviation data for online experience at this institution, while Table R14 reported the Kruskal Wallis results. There were five online experiences at researched institution (as measured by courses) brackets analyzed for differences between means for COI, teaching presence, social presence, and cognitive presence. The five brackets included zero to five courses (n = 12), six to 10 (n = 18), 11 to 15 (n = 17), 16 to 20 courses (n = 17), and greater than 20 courses (n = 9). There were 14 non-responses.

Figure 15

Boxplot of courses successfully completed online courses at institution and COI



Note: oUNIV was shorthand for online courses at the researched university. Boxplots are labeled in the title area from left to right.

The COI overall score was highest for the greater than 20 courses (n = 9. M = 4.34, s = .558), 16 to 20 courses (n = 17, M = 4.07, s = .816), zero to five courses (n = 12, M = 3.92, s = .696). Both 11 to 15 courses (n = 17, s = .739) and six to 10 courses (n = 18, s = .900) were tied as the lowest COI mean with means of 3.88.

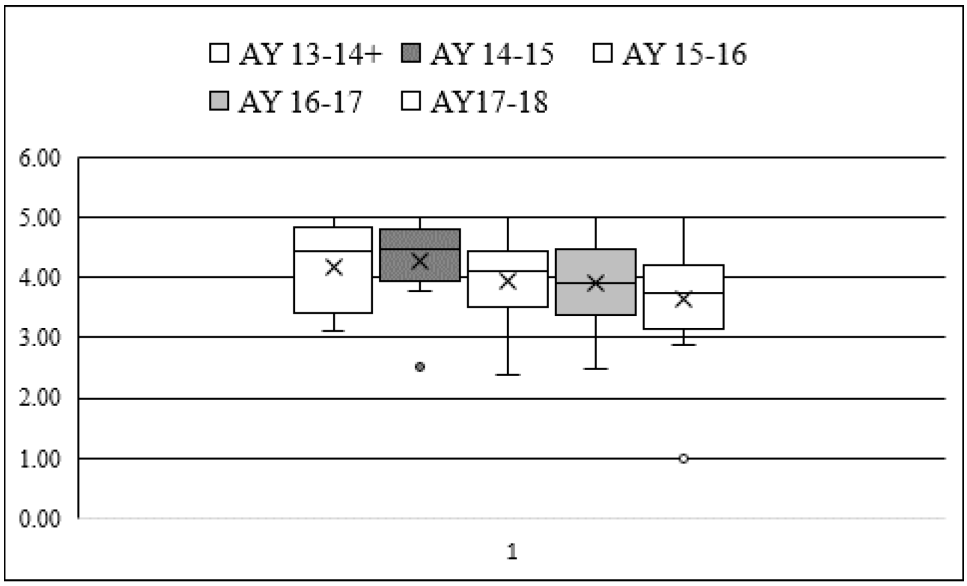
RQ 2.g Amount of time with advising: start date at institution. The COI overall scores from highest to lowest almost fell in order from oldest Start date to first year students: AY 2014-2015 (n = 13, M = 4.29, s = .639), AY 2013-2014 and older (n = 9, M = 4.19, s = .705), AY 2015-2016 (n = 22, M = 3.93, s = .729), AY 2016-2017 (n = 18, M = 3.91, s = .726), and AY 2017-2018 (n = 12, M = 3.64, s = 1.01). The teaching presence means descended from highest to lowest as years of enrollment decreased, in order. There was no predictable order for social presence or cognitive presence. Social presence was the highest element mean for AY 2014-2015, AY 2015-2016, and AY 2016-2017. Teaching presence was the highest element mean for those in their first year of enrollment, AY 2017-2018, and those with five or more years of enrollment, AY 2013-2014 and older. Cognitive presence had the lowest element score across all academic years reported. Table R15 illustrated sample size, mean, and standard deviation data for Start date at institution, while Table R16 reported Kruskal Wallis results.

Five academic year (AY) brackets emerged from the reported Start dates from participants. Academic years included the fall of year, spring of year +1, and summer of year +1. For example, AY 2016-2017 included the fall of 2016, and the spring and summer of 2017. The five brackets included AY 2017-2018 (n = 12, fall and spring, in first year of enrollment), AY 2016-2017 (n = 18, second year), AY 2015-2016 (n = 22, third year), AY 2014-2015 (n = 13, fourth year), and AY 2013-2014 or older (n = 9, five or more years of enrollment).

Academic year 2013-2014 (n = 6) included additional students who started in fall of 2011(n = 1), fall 2012 (n = 1) or summer of 2013 (n = 1). There were 13 non-responses.

Figure 16

Boxplot for Start date (time at institution with advising) and COI



Note. Time at institution with advising was calculated from reported start term and year. Boxplots are labeled in the title area from left to right, from the left AY 16-17 is fourth and AY 15-16 is fifth.

Summary of COI and demographic analysis. There were no significant differences found when COI and element scores were examined by demographic criteria. The question of relationship between the academic advising COI scores and descriptive characteristics included examination across multiple levels of each characteristic response choice. In the majority of cases, most demographic groups agreed with the over ranks of social presence first, teaching presence second, and cognitive presence third. The minority exceptions in rank were as follows. Teaching presence was ranked as first for the American Indian or Alaskan Native participant, sophomores, those with zero to five or over 20 successfully completed courses at the institution,

and those within their first year or over five years of their start date with the institution. While all others ranked cognitive presence as last, the sophomores ranked it first. Those who had the highest mean COI scores within their demographic included females over males, "no, Hispanic or Latino" over "yes, Hispanic or Latino," minorities over whites and bi-racial, 45 to 50-year-old's, sophomores, 11 to 15 courses completed at other institutions, and 20 plus courses at institution. For Start date (time with advisor) the COI scores almost rose from low to high as participants went from new (in first year) to over five years with the institution. The participants at or over five years were below those at the four-year mark, otherwise the groups descended in COI by reduction in Start dates sorted by academic year.

RQ 3 Data Analysis – Importance and Academic Advising COI

3. Is there a relationship between presence scores (teaching, cognitive, social, COI) and importance rankings? As measured by the COI and importance ranking scores.

Research question data analysis revealed a positive relationship in scores of COI, teaching presence, and social presence. This positive relationship suggests that as Importance increases, so does COI, and the level of explained variance is 41%, which is considered moderate since a perfect correlation is equal to one. The coefficient of determination ($r^2 = 0.41$ implies that 41% of the variability between the two variables has been accounted for, and the remaining 59% of the variability is still unaccounted for, however correlation does not imply causation. The Spearman rank-order correlation calculated COI and importance at $r^2 = 0.41$, $r_s = .64$, $df = 69$, $p < .01$ ($n = 71$), teaching presence $at\ r^2 = 0.34$, $r_s = .58$, $df = 69$, $p < .01$ ($n = 71$), and social presence $at\ r^2 = 0.29$, $r_s = .54$, $df = 69$, $p < .01$ ($n = 71$). The null hypotheses of negative or neutral relationship between COI, teaching, and social presences and importance were rejected. However, the correlation between importance and cognitive failed to reject the null hypothesis,

as cognitive presence had no evidence to suggest a relationship with importance r^2=.0025, r_s = -0.05, *df* = 69, *p* < .01 (*n* = 71). The analysis between the academic advising COI scores (*n* = 85) and importance rankings (*n* = 87) included examination of means, standard deviations, and Cohen's effect size. All items had a higher COI score than importance score, and effect sizes were all large. Importance only agreed with COI on the ranking of cognitive presence as third. Ladder graphs examined importance scores in relation to COI scores. Appendix S includes all supplemental tables for research question three.

RQ 3.a Teaching Presence. Teaching presence scores included 13 statements organized under three categories: design and organization, facilitation, and direct instruction. There was agreement between importance and COI on the highest category of design and organization, but the categories of facilitations and direct instruction were second and third for importance and reversed for COI. There was agreement across all three categories on the highest item and for two categories had agreement on the lowest items between importance and COI. Ladder graphs illustrated differences in teaching presence between COI and importance means for research question three. All effect sizes were large across all teaching presence items and categories.

Design and organization. There was agreement in highest and lowest item mean between importance rank and COI. The highest mean for importance (*n* = 84, *M* = 4.14, *s* = 1.13) and COI (*n* = 80, *M* = 4.4, *s* = .875) within the design and organization category was item four, *the academic advisor communicated important due dates/time frames clearly*. The lowest mean for importance (*n* = 84, *M* = 3.73, *s* = 1.62) and COI (*n* = 80, *M* = 3.94, *s* = 1.11) for the design and organization category was item three, *the academic advisor provided clear instructions on how to participate in academic success learning activities*. Table S1 illustrates data for COI

overall, importance, and Cohen's effect size. The design and organization category for teaching presence was measured by four items.

Facilitation. There was agreement on the highest and lowest item between importance (n = 84, M = 3.84, s = 1.18) and COI (n = 80, M = 4.05, s = 1.05). The highest mean for importance and COI within the facilitation category was item six, *the academic advisor assisted in guiding me towards understanding academic success in a way that helped me clarify my thinking*. There was a tie for lowest importance mean (n = 84, M = 3.56) between item five (s = 1.28) and 10 (s = 1.37). COI lowest item (n = 80, M = 3.84, s = 1.05) was also item five, *the academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn*. Item 10, *academic advisor actions reinforced the development of a sense of community within the *online campus*, tied for lowest mean for importance. Table S2 illustrates data for COI overall, importance, and Cohen's effect size. The facilitation category for teaching presence was measured by six items.

Direct instruction. There was agreement on the highest item between importance and COI. The highest mean for importance (n = 85, M = 4.06, s = 1.34) and COI (n = 80, M = 4.49, s = .758) was item 13, *the academic advisor responded in a timely fashion*, and the highest mean for COI. The lowest importance mean for the direct instruction category was item 11, *the academic advisor focused the discussion on relevant issues in a way that helped me to learn* (n = 84, M = 3.61, s = 1.35). The lowest COI item mean was item 12, *the academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives* (n = 79, M = 3.94, s = 1.08). Three items measured the direct instruction category for teaching presence. Table S3 illustrates data for COI overall, importance, and Cohen's effect size.

Teaching presence overall. Importance and COI agreed the design and organization category ranked first. However, importance ranked the facilitation category second, and the direct instruction category third. COI reversed the second and third categories. A large (≥.80) Cohen's effect size was found when comparing COI versus importance scores, across all categories and teaching presence. Teaching presence was scored using three categories: design and organization, facilitation, and direct instruction. Table 11 illustrates data for COI overall, importance, and Cohen's effect size. A review of the 13 teaching presence items revealed the highest item means for COI, and importance ranking were different, as were the lowest item means (refer to table S11 and S12 which show the items ranked by importance).

Table 13

RQ 3.a Teaching Presence Summary for COI and Importance

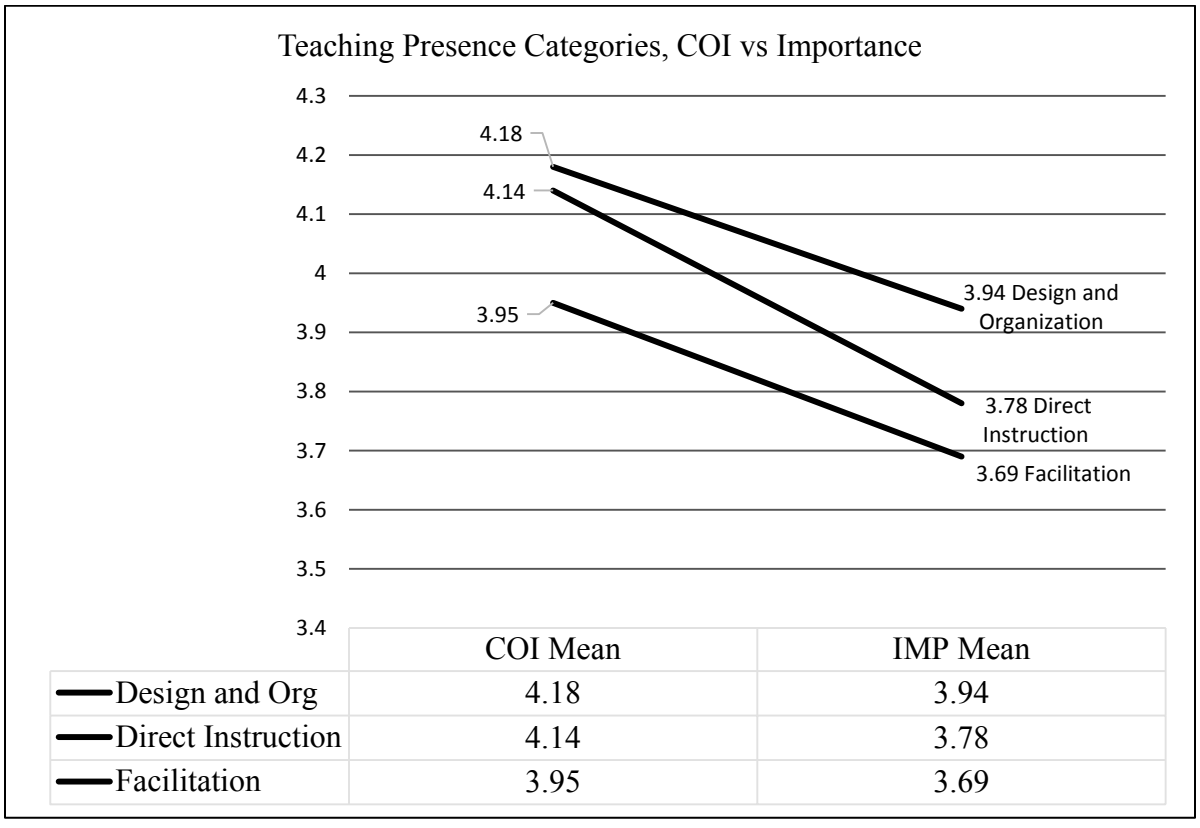
Category and items	COI Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Design and Organization	80	4.18	.962	84	3.94	1.18	2.02
Facilitation	80	3.95	1.02	84	3.69	1.26	2.05
Direct Instruction	80	4.14	.932	84	3.78	1.36	2.80
Teaching Presence	80	4.06	.984	84	3.79	1.26	2.16

Figure 17 illustrates teaching presence COI means (left) and importance means (right) by category. Design and organization maintained the highest mean across COI and importance. Direct instruction held the middle for both COI and importance. Facilitation was the lowest mean for both COI and importance between the three categories of social presence. Although

students perceived the degree of COI being similar for design and organization (M_{COI} = 4.18) and direct instruction (M_{COI} = 4.14), participants felt that design and organization (M_{IMP} = 3.94) was a more important category than direct instruction (M_{IMP} = 3.78). This was shown by the separation in the ladder graph of design and organization and direct instruction means on the right side (importance).

Figure 17

RQ 3.a Teaching Presence ladder graph for COI and Importance



	COI Mean	IMP Mean
Design and Org	4.18	3.94
Direct Instruction	4.14	3.78
Facilitation	3.95	3.69

RQ 3.b Social Presence. Social presence scores included nine statements organized under three categories: affective expression, open communication, and group communication. Importance and COI ranked the social presence categories as open communication first, group

cohesion second, and affective expression third. Importance and COI also agreed on the highest item, but not the lowest. Effect sizes were large across all items, categories, and social presence. Ladder graphs illustrated differences in social presence between COI and importance means for research question three.

Affective expression. Importance and COI agreed on the highest item. Item 16, *online or web-based communication is an excellent medium for social interaction*, had the highest mean for importance rank (n = 87, M = 3.64, s = 1.20), and for COI (n = 80, M = 4.4, s = .875). The lowest importance mean was item 15, *I formed distinct impressions about my academic advisor* (n = 87, M = 3.41, s = 1.32). The second lowest mean for COI was item 15 (n = 85, M = 4.05, s = .957). The lowest mean for COI in this category was for item 14 (n = 85, M = 3.92, s = 1.08), *I have gotten to know my academic advisor, adding to my sense of belonging in online campus*. The affective expression category for social presence was measured by three statements. Table S4 illustrates data for COI overall, importance, and Cohen's effect size.

Open communication. Agreement was found between importance and COI on highest and lowest item. The highest mean for importance (n = 87, M = 4.07, s = 1.13) and COI (n = 80, M = 4.4, s = .875) within the open communication category was item 19, *I felt comfortable interacting with my academic advisor*. The lowest item for importance (n = 86, M = 3.66, s = 1.24) and COI (n = 85, M = 3.82, s = .923) was item 18, *I felt comfortable participating in academic success discussions*. Three statements measured the open communication category for social presence. Table S5 illustrates data for COI overall, importance, and Cohen's effect size.

Group cohesion. Agreement was found between importance and COI on highest and lowest item. Item 21, *the academic advisor communicated important academic success goals clearly*, had the largest item mean for importance (n = 87, M = 4.01, s = 1.13), and COI (n = 85,

M = 4.18, *s* = .935). The lowest item for importance (*n* = 86, *M* = 3.49, *s* = 1.33) and COI (*n* =85, *M* = 3.82, *s* = .923) was item 20, *the academic advisor communicated important academic success strategies clearly*. Table S6 illustrates data for COI overall, importance, and Cohen's effect size. The group cohesion category for social presence was measured by three statements.

Social presence overall. Importance and COI agreement on the rank of categories from high to low with open communication first, group cohesion second, and affective expression third. Table 12 illustrated data for COI overall, importance, and Cohen's effect size. A large (≥.80) Cohen's effect size was found when comparing COI versus importance scores, across all categories and social presence. Social presence was scored using three categories: affective expression, open communication, and group cohesion. Importance also agreed with COI on highest item, but not the lowest. A review of the nine items measuring social presence revealed the highest item mean for COI, and importance was item 19, *I felt comfortable interacting with my academic advisor*. The lowest item means for COI and importance rank were not the same (refer to table T11 which shows the items ranked by importance).

Table 14

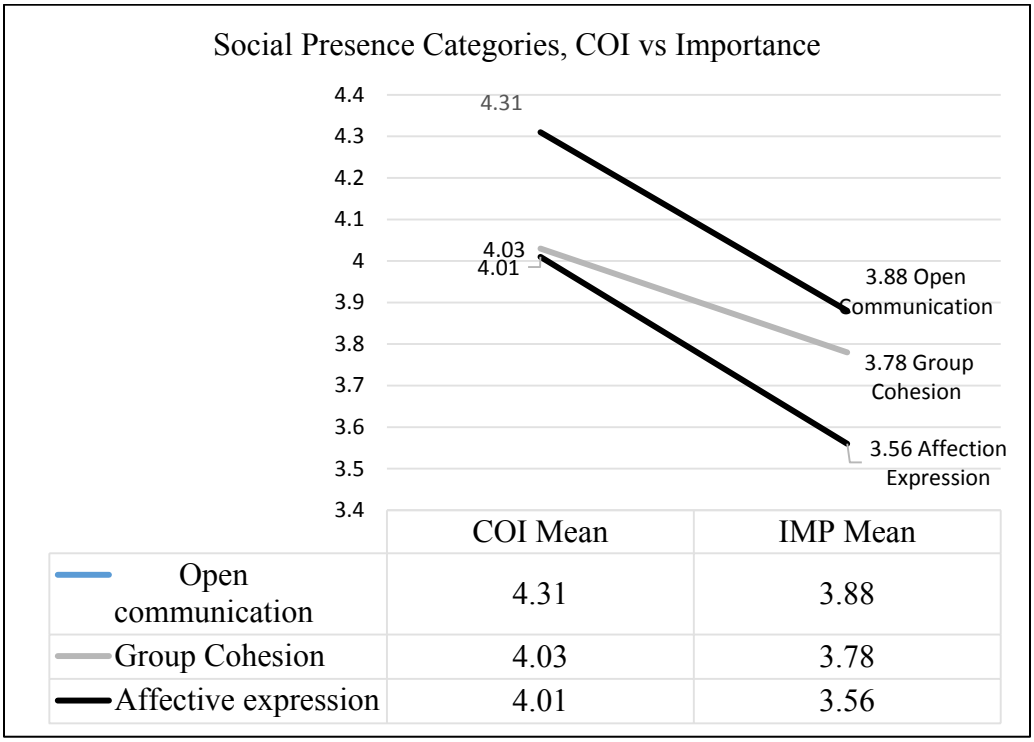
RQ 3.b Social Presence Summary for COI and Importance

Category and items	COI Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Affective Expression	85	4.01	.986	87	3.56	1.23	3.74
Open Communication	85	4.31	.890	87	3.88	1.18	3.82
Group Cohesion	85	4.03	.948	86	3.78	1.12	2.23
Social Presence	85	4.12	.942	87	3.74	1.21	3.25

Figure 18 illustrates social presence COI means (left) and importance means (right) by category. Open communication maintained the highest mean across COI and importance. Group cohesion held the middle for both COI and importance. Affective Expression was the lowest mean for both COI and importance between the three categories of social presence. Although students perceived the degree of COI being similar for group cohesion (M_{COI} = 4.03) and affective expression (M_{COI} = 4.01), participants felt that group cohesion (M_{IMP} = 3.78) was a more important category than affective expression (M_{IMP} = 3.56). This was shown by the sharp separation in the ladder graph of group cohesion and affective expression means on the right side (importance).

Figure 18

RQ 3.b Social Presence ladder graph for COI and Importance



RQ 3.c Cognitive Presence. Cognitive presence scores included 12 statements organized under four categories: triggering event, exploration, integration, and resolution. Category ranks between importance and COI were similar with importance ranking triggering event first, exploration and integration as tied for second, and resolution third. COI, however, ranked exploration first, agreeing with integration as second, but ranked triggering event third. Both importance and COI agreed on the resolution category as forth. All effect sizes were large. COI and importance differed in highest and lowest items. Ladder graphs illustrated differences in cognitive presence between COI and importance means for research question three.

Triggering Event. Agreement occurred between importance and COI on highest and lowest items. Item 25, *I was motivated to explore resources suggested by my academic advisor*, had the highest mean for importance rank (n = 79, M = 3.61, s = 1.27), and for COI (n = 84, M = 3.92, s = 1.05). The lowest item for importance (n = 79, M = 3.24, s = 1.34) and COI (n = 84, M = 3.70, s = .985) was item twenty-four, *Academic success activities engaged my curiosity*. The triggering event category for cognitive presence was measured by three items. Table S7 illustrates data for COI overall, importance, and Cohen's effect size.

Exploration. Agreement occurred between importance and COI on highest and lowest items. Item 28, *advising discussions were valuable in helping me appreciate different perspectives*, was the highest mean for importance (n = 79, M = 3.44, s = 1.34), and for COI (n = 83, M = 3.89, s = 1.06). The lowest item for importance (n = 79, M = 3.25, s = 1.33) and COI (n = 84, M = 3.80, s = .985) was item 26, *I utilized a variety of information sources to explore questions posed by my academic advisor*. Table S8 illustrates data for COI overall, importance, and Cohen's effect size. Three items measured the exploration category for cognitive presence.

Integration. There was no agreement on either highest or lowest item between importance and COI, although COI ranked the lowest importance item as second lowest. In complete contrast to the COI score, item 30, *academic success activities helped me construct explanations and solutions,* had the highest mean for importance rank (n = 79, M = 3.49, s = 1.23). Item 31, *reflecting about academic advising discussions helped me understand fundamental concepts for my academic success*, was the highest mean for COI (n = 84, M = 3.95, s = .937). The lowest importance and second lowest to COI (n=84, M=3.79, s=1.01) was item 29, *integrating new information helped me answer questions raised by my academic advisor* (n = 79, M = 3.29, s = 1.32). The lowest mean for COI in this category was for item 30 (n = 84, M = 3.74, s = .989), *academic success activities helped me construct explanations and solutions*. Table S9 illustrates data for COI overall, importance, and Cohen's effect size. The integration category for cognitive presence was measured by three statements.

Resolution. Item 33, *I developed solutions to academic success problems that can be applied in practice*, had the highest mean for importance rank (n = 79, M = 3.44, s = 1.29), and for COI (n = 84, M = 3.86, s = 1.05). The lowest item for importance (n = 79, M = 3.28, s = 1.33) and COI (n = 84, M = 3.35, s = 1.04) was item 34, *I applied strategies learned through academic advising to my work or other non-class related activities*. Table S10 illustrates data for COI overall, importance, and Cohen's effect size. The resolution category for cognitive presence was measured by three statements.

Cognitive presence overall. In an examination of the category means, exploration was the category that scored the highest overall mean for COI (n = 84, M = 3.85, s = .996) while the triggering event category was the highest mean for importance (n = 79, M = 3.44, s = 1.29). The resolution category means scored lowest for both importance (n = 79, M = 3.36, s = 1.30) and

COI (n = 84, M = 3.67, s = 1.03). Table 13 illustrates data for COI overall, importance, and Cohen's effect size. All Cohen's effect size differences in means were large (≥.80). Cognitive presence was scored using 12 items organized under four categories: triggering event, exploration, integration, and resolution. A review of the 12 items measuring cognitive presence revealed that there was a difference in highest and lowest items (refer to table T11 which shows the items ranked by importance).

Table 15

RQ 3.c Cognitive Presence Summary for COI and Importance

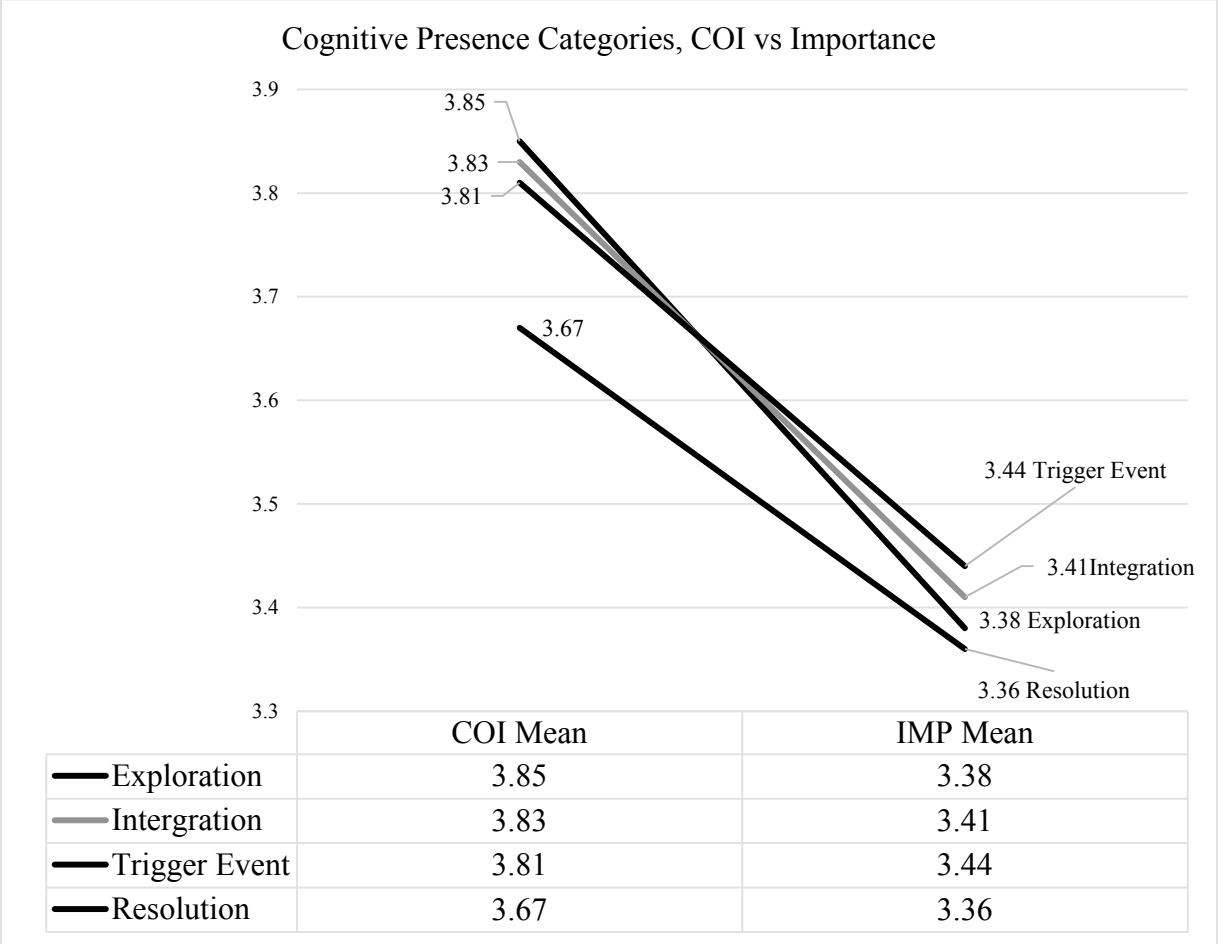
Category and items	COI Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Triggering Event	84	3.81	1.00	79	3.44	1.29	2.89
Exploration	84	3.85	.996	79	3.38	1.30	3.66
Integration	84	3.83	.980	79	3.41	1.26	3.66
Resolution	84	3.67	1.03	79	3.36	1.30	2.39
Cognitive Presence	84	3.79	1.00	79	3.41	1.29	2.39

Figure 19 illustrates cognitive presence COI means (left) and importance means (right) by category. Unlike teaching and social presence, two of the four categories switched in order from highest mean to lowest between COI and importance. Hence Figure 19 shows the categories of exploration and triggering event crossing in the middle and forming an X pattern

and rearranging themselves into order on the right side (importance). Exploration was the highest mean in COI and third in importance. Integration held the second highest mean in COI and importance. Triggering event was the third mean for COI and the highest mean in importance. Resolution was the lowest mean for both COI and importance. All categories had agreement that importance was ranked lower than COI, with importance means ranging between a score of *important* (3 on Likert scale) or *very important* (4.0).

Figure 19

RQ 3.c Cognitive Presence ladder graph for COI and Importance



	COI Mean	IMP Mean
Exploration	3.85	3.38
Intergration	3.83	3.41
Trigger Event	3.81	3.44
Resolution	3.67	3.36

Note. The horizontal y-axis was manipulated to improve visibility of the means, which all fell between 3.36 and 3.85. Other tables in this section had y-axis ranging from 3.3 to 4.4.

RQ 3.d COI Overall and Importance Rankings. Online students considered the COI items of *somewhat importance* or higher in online academic advising (3 = *somewhat important* on Likert five-point scale). Importance and COI agreed in rank for cognitive presence as third. The highest mean items, lowest mean items, and categories differed between importance and COI. Importance ranked teaching presence first (second for COI), and social presence second, (COI ranked it first). However, the lowest element was the same for both importance and COI overall score. The lowest element mean for importance and COI overall was cognitive presence. All elements and categories had a Cohen's effect size of large. As the last table in the importance section, Table 14 includes the importance and COI scores by category and element scores for number, mean, standard deviation, and effect size importance, and COI.

The highest category mean for importance was design and organization (n = 84, M = 3.94, s = 1.18). The highest category mean for COI overall was open communication (n = 84, M = 4.31, s = .890). The lowest category mean for importance was exploration (n = 79, M = 3.38, s = 1.30) while the lowest category mean for COI overall was resolution. A review of the 34 items measuring COI revealed that there was a difference in highest and lowest items between importance and COI (refer to table S11 and S12 which show the items ranked by importance).

Table 16

RQ 3. Hypothesis summary: Importance and COI scores

Category and items	COI Score			Importance			IMP vs COI Effect Size	Ho	Ho Action
	n	*M*	*s*	*n*	*M*	*s*			
Design and Organization	80	4.18	.962	84	3.94	1.18	2.02	3.a.1	Failed to reject
Facilitation	80	3.95	1.02	84	3.69	1.26	2.05	3.a.2	Failed to reject
Direct Instruction	80	4.14	.932	84	3.78	1.36	2.80	3.a.3	Failed to reject
Teaching Presence	80	4.06	.984	84	3.79	1.26	2.16	3.a	Failed to reject
Triggering Event	84	3.81	1.00	84	3.44	1.29	2.89	3.b.1	Failed to reject
Exploration	84	3.85	.996	84	3.38	1.30	3.66	3.b.2	Failed to reject
Integration	84	3.83	.980	84	3.41	1.26	3.36	3.b.3	Failed to reject
Resolution	84	3.67	1.03	84	3.36	1.30	2.39	3.b.4	Failed to reject
Cognitive Presence	84	3.79	1.00	84	3.41	1.29	2.97	3.b	Failed to reject
Affective Expression	85	4.01	.986	84	3.56	1.23	3.74	3.c.1	Failed to reject
Open Communication	85	4.31	.890	84	3.88	1.18	3.82	3.c.2	Failed to reject
Group Cohesion	85	4.03	.948	84	3.78	1.12	2.23	3.c.3	Failed to reject
Social Presence	85	4.12	.942	84	3.74	1.21	3.25	3.c	Failed to reject
COI Overall	85	3.98	.979	84	3.64	1.26	2.76	3.	Failed to reject

Note: IMP was shorthand for importance. *n* = number of responses, *M* = Mean, *s* = Standard Deviation, Cohen's Effect Size of magnitude of difference in means: small .20, medium .50, large .80

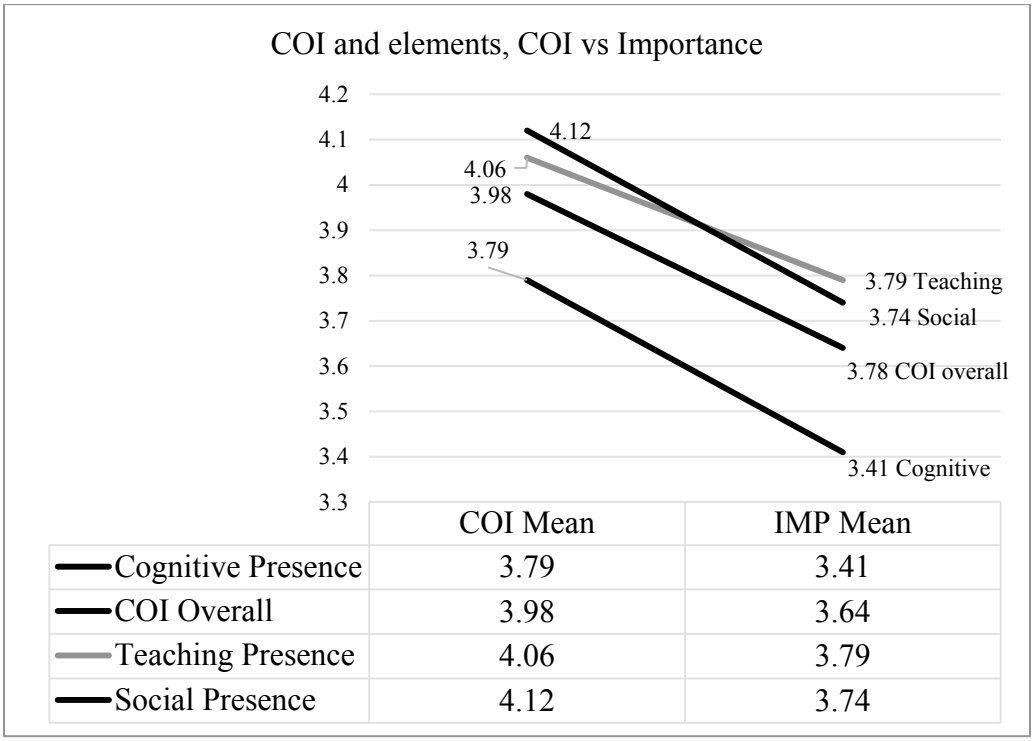
Summary of COI and importance rankings. Research question three asked if there was a positive relationship in scores of COI and its elements (teaching, cognitive, social) and importance rankings. A positive relationship was found between importance and COI, teaching presence, and social presence, therefore rejecting the null hypothesis. There was no correlation found between COI and cognitive presence, which failed to reject the null hypothesis. There were no importance scores higher than the corresponding COI score across categories, presences

or COI. An importance rating higher than a COI rating would immediately indicate an area that needed to be addressed. Findings revealed that there was no dissonance between the level participants agreed (measured by mean) with COI statements and the reported importance ranking. Table S11 (top 17 items) and Table S12 (bottom 17 items) show the entire list of 34 items sorted highest to lowest by importance rank with corresponding importance mean, COI mean, and COI item rank for comparisons. Table S13 (top 17 items) and Table S14 (bottom 17 items) provide the same information sorted by COI rank. Scatter plots illustrated relational correlations, and ladder graphs were included to visually examine the importance scores in relation with the COI scores. Figure 20 illustrated COI and element means for COI (left) and importance (right). Figure 20 shows the social presence element crossing from the highest COI mean, to the second highest importance mean.

Teaching presence was second for COI and was the highest mean for importance. Cognitive presence was stable as the lowest mean for both COI and importance. Overall COI, like the three elements teaching presence, social presence, and cognitive presence, were perceived higher in COI than in importance by participants.

Figure 20

RQ 3.d Summary of COI and Elements, ladder graph for COI and Importance

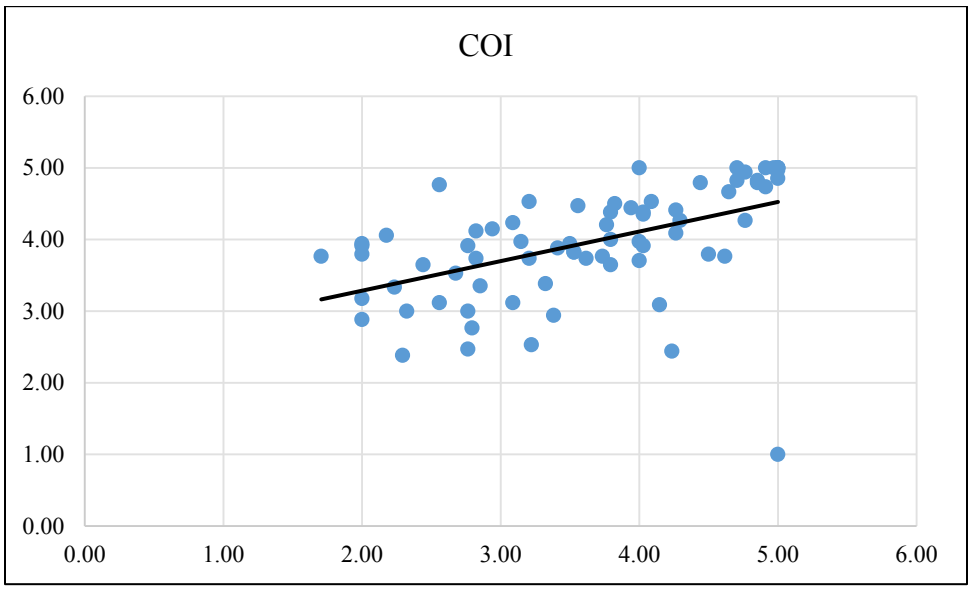


	COI Mean	IMP Mean
Cognitive Presence	3.79	3.41
COI Overall	3.98	3.64
Teaching Presence	4.06	3.79
Social Presence	4.12	3.74

There was a positive correlation found between Importance and COI. The relationship is illustrated in Figure 21, which shows a scatter plot of scores for COI and Importance. The results conclude they are associated positively with a coefficient of determination, r^2=0.41, where 41% of the variance in COI was accounted for by variation in Importance, and vice versa. Forty-one percent can also be referred to as the magnitude of linear association between the two variables.

Figure 21

Magnitude of linear association between two variables: Importance and COI



Analysis of open-ended questions. Participants only reported positive comments for phone/TDD and web conferencing. For presence, social presence was the most popular code followed by teaching presence second, and cognitive presence last, across all Technologies experienced (none, other, phone/TDD, and web conferencing). Only two comments were coded for a cognitive presence. For categories, the open communication category had the highest amount of coded, while the affective expression category ranked second across all technology choices. Direct instruction was the third category for all technology choices, except those who reported none. The cognitive presence category of integration was coded once for phone/TDD, and the exploration category was coded once for other (email).

A question in the survey asked participants to declare all technologies experienced with academic advising appointments (phone, web conferencing, other, and none). The survey auto populated two follow up questions for each experienced technology. First, they were asked to

rate their satisfaction for that specific technology. If they chose "other", they were also asked to fill in that other technology. Second, participants then responded to the following open-ended prompt: please comment on your experience using [technology] for advising appointments. Comments were coded for value (value or directional options: positive, neutral, and negative) and category. A total of 22 participants commented. As three participants commented on multiple technologies, there were 26 separate comments. The technology comments spanned across all answer choices of none (n = 2), other (n = 12), phone/TDD (n = 9), and web conferencing (n = 2). Because comments could be assigned to multiple categories, there was a total of 49 classifications with 18 for phone/TDD and four for web conferencing.

No experience using technology with advising. Of the participants who reported *no* experience using technology (n = 2), three comments had negative directional coding and three were positive (Table 17). These directional codes somewhat agreed with the satisfaction ratings reported for no technology: one *neutral* and one *very dissatisfied*. Coding revealed a tie between social presence and teaching presence, and there were no codes for any category in cognitive presence. Classification codes included the following categories from highest to lowest: open communication (two), affective communication (two), with facilitation and design and organization tied for last with one coding each. Table 17 illustrates all the open-ended comments about no technology.

Table 17

No technology open-ended comments

	No technology experiences: examples of open-ended comments
	Teaching Presence
	Facilitation:
(-)	I did not know they [advisors] were available to online students
	Design and Organization
(+)	I knew what I wanted to do, I just needed help navigating through the steps.
	Social Presence
	Affective Expression:
(-)	Not very impressed.
	Affective Expression:
(-)	Since I have enrolled I do not feel the advisor knows me or my situation and have not felt supported in becoming an integrated member of the Global
(+)	Community.
	I feel they are very important to the learning process in preparation for graduation.
	Open Communication:
(+)	My advisor did that [helped] via email and over the phone, as needed.

Note. The answer choice selected was "none" and labeled in table title as "no technology".

Other technology experiences. Of the participants who reported *other* for technology (*n* = 12), all comments were coded positive. These directional codes agreed with the satisfaction ratings reported for other: one *satisfied* and eleven *very satisfied*. Those who selected other were asked an additional follow up question to report what other technology they utilized with their academic advisor. All those who chose the other technology option reported using email, and three also reported taking the time to visit campus to meet with their academic advisor at least once. Social presence ranked first, teaching presence ranked second, and cognitive presence ranked third. Classification codes included the following categories from highest to lowest: open communication (seven codes), affective communication (five), with facilitation and direct instruction tied with two codes each. Design and organization tied for last with exploration with

one coding each. Table 18 illustrates a few examples of open-ended comments about other technology.

Table 18

Other technology open-ended comments

	Other experiences: examples of open-ended comments
	Teaching Presence
	Facilitation:
(+)	My advisor has been great to work with and points out things in my schedule that I may not notice. She knows my outside commitments and helps me plan accordingly.
	Design and Organization:
(+)	E-mails are great and efficient but do not necessarily build a relationship.
	Social Presence
	Affective Expression & Open Communication:
(+)	My adviser has always replied very promptly, seems to always have a positive welcoming attitude which makes me feel comfortable communicating with her, and emailing is an ideal form of communication for me as my schedule is very tight during the week day and would be difficult to communicate in other ways.
	Open Communication:
(+)	Just used email and it was very successful
	Cognitive Presence
	Exploration:
(+)	Questions and/or comments were always thorough enough to understand.

Phone/TDD experiences with advising. All comments regarding *phone/TDD* technology (n = 10) experienced through academic advising appointments were positive. These directional codes mostly agreed with the satisfaction ratings reported for phone/TDD experiences: one *satisfied*, five *very satisfied*, one *neutral*, and one *very dissatisfied*. The *neutral* and *very dissatisfied* participants both reported preference for web conferencing. Social presence was ranked first, teaching presence was second, and cognitive presence third. Classification codes

for comments included the following categories from highest to lowest: open communication (five), affective communication (four), direct instruction (three), open communication (two) with facilitation, design and organization, and integration tied for last with one coding each. Table 19 illustrates a few examples of open-ended comments about phone/TDD technology.

Table 19

Phone/TDD open-ended comments

	Phone/TDD experiences: examples of open-ended comments
	Teaching Presence
	Direct Instruction:
(+)	She is very polite, informative, and helpful.
	Social Presence
	Affective Communication:
(+)	Made me feel comfortable and was great!
	Open Communication
(+)	[Advisor name] has been amazing and communicates with me effectively and clearly while helping me realize my goals in a timely and realistic manner.
	Group Cohesion:
(+)	By speaking with my adviser on the phone, it created a more personal relationship. Global campus students can often feel alone and left out, but when you can reach your advisers or professors by phone, it makes you feel connected to the university.
	Cognitive Presence
	Integration:
(+)	I … and felt comfortable asking questions and took away valuable information related to the industry.

Web conferencing experiences with advising. All comments regarding *web conferencing* technology ($n = 2$) experienced through academic advising appointments were positive. These directional codes mostly agreed with the satisfaction ratings reported for phone/TDD experiences of *very satisfied* (two). Social presence was ranked first, teaching presence was second, and cognitive presence had no coded categories. Classification codes for comments included the following categories from highest to lowest: open communication (two),

affective communication (one), and direct instruction (one). Table 20 illustrates a few examples of open-ended comments about web conferencing technology.

Table 20

Web Conferencing open-ended comments

	Web conferencing experiences: examples of open-ended comments
	Teaching Presence
	Facilitation:
(+)	My advisor has been great to work with and points out things in my schedule that I may not notice. She knows my outside commitments and helps me plan accordingly.
	Social Presence
	Open Communication:
(+)	I like how I can be anywhere and to my degree work!

Findings for those who reported multiple technologies. Participant number 21 reported satisfaction ratings for three experiences with phone (*very dissatisfied*), while reporting being *very satisfied* with web conferencing, and other (email). Participants numbered 78 and 85 reported experiencing both other (email) and phone/TDD and were *very satisfied* with both.

Summary of open-ended comments. Across all 26 comments, all but three were directionally positive. Social presence ranking first, teaching presence second and cognitive presence last according to the number of classification codes in the open-ended comments. There was agreement across all technology experiences for the top three categories: open communication, affective expression, and direct communication.

Chapter Summary

In summary, chapter four included a discussion of the sample introducing participants' descriptive characteristics, and an instrument analysis section. An analysis of data for three research questions followed. For research question one, which focused on COI and the

technology preference for academic advising appointments, no significant difference between phone and web conferencing preference was found for any of the 34 COI items. Research question one analysis included charts in Appendix Q.

Research question two focused on COI and the descriptive characteristics of participants. Eight different categories were discussed: Gender, Ethnicity, Race, Age, Courses completed towards degree, Online experience at other institutions, Online experiences at the researched institution, and the Start date at the institution. Research question two analysis included box plot graphs and charts in Appendix R. Research question three focused on COI and Importance ratings. Ladder graphs in the summary section illustrated the relationship between COI and Importance, and all items, elements, and COI reported higher agreement than Importance ratings, as measured by means. Research question three analysis included charts in Appendix S. The final analysis section included qualitative coding of comments from open-ended questions. Additional descriptive characteristics added context to the open-ended comments: technologies experienced during academic advising appointments and the Satisfaction rating.

Chapter Five – Discussion, Analysis, & Implications

This study adopted the community of inquiry framework (COI) and modified the COI instrument for online academic advising. The modified academic advising COI instrument captured the perceptions of online degree-seeking undergraduate students enrolled in the spring 2018, term. The research design for this study employed a comparative approach, utilizing an online instrument with open-ended questions, and data required both qualitative and quantitative analysis.

Discussion

This research extended the theoretical COI framework into the realm of online academic advising. The COI theoretical framework focused on students' perceptions of their online learning environment and offered a new paradigm in understanding and assessing online academic advising practices. The COI framework provided a way to explain a student's perception of their online learning environment, including teaching presence, social presence, and cognitive presence. In other words, the COI framework emphasized a collaborative view of teaching and learning, while encouraging engagement in the online environment. Although experimental research, this study expands academic advising theoretical concepts to serve online students better and improve their learning conditions and experiences. Advisor types, organizational models, and institutional missions are diverse; COI offers clear, practical ways to accommodate that diversity across the advising profession to assess the needs of students.

RQ 1. Discussion of COI and Preference for Advising Technology

Online students perceived COI (as well as teaching presence, social presence, and cognitive presence) in online academic advising. Participants reported feeling connected with their institution through their advisor, and comfortable in communicating with their advisor. The

perception of COI in advising was an expected result. First, COI literature had expanded research beyond the online classroom into one-on-one relationships and online program assessments. Second, academic advising had emphasized the concept of advising as teaching (NACADA, 2006). The expansion of COI beyond the classroom, and the concept of advising as teaching formed the foundation connecting academic advising and COI.

Not rejecting the null hypothesis was desirable. There was no significant difference in COI when comparing students' preferences for technology. Finding no significant difference between means for phone/TDD and web conferencing suggested that students perceived both communication technologies as conduits for communication and a community of inquiry. In other words, both phone and web conferencing supported advising appointments, as categorized by COI. These initial findings suggest that type of technology may not be significant, which is important as communication technology (limited to two options in this research) varies across higher education institutions, advising models, and types of advisors. The lack of significant difference between phone/TDD and web conferencing shows support for Steele's (2014) intentional use of technology in academic advising model, where a variety of technologies overlapped with purposeful impact on learning, engagement, and service.

Online undergraduate students reported their agreement quantitatively and qualitatively. The less complex academic advising COI items scored quite well. However, as complexity increased, additional time spent with advisee and relationship building was needed. For example, eight of the bottom 10 item means were under cognitive presence. Lower scores for complex tasks, such as items that measure cognitive presence, was not a surprise. First, Smith & Allen (2006) reported students ranked receiving accurate information from their advisor as first, out of 12 items, over other complex developmental tasks. Second, COI research in online

classrooms also found basic tasks were perceived higher than more complex cognitive tasks (Garrison, 2011; Garrison et al., 2010).

Items within cognitive presence focused on Garrison et al. (1999) practical inquiry model (triggering event, exploration, integration, and resolution). Academic advising COI findings found item scores and open-ended comments agreed on the ranking of cognitive categories as exploration first, integration second, and to some lesser degree participants perceived triggering events third, and resolution fourth. These findings suggest the process of practical inquiry was active in online academic advising experiences, where participants may prefer to seek help with exploration and integration of new knowledge.

Informed by literature focused on adult education, the tepid agreement with triggering event items was not found to be of concern. Triggering events can happen in personal, professional, and academic spaces. In post-traditional literature, adult students depended on family and other support structures outside of the university and delayed asking questions of institutional staff (Polson, 1994a; Tones et al., 2009). Alternate support structures may explain the perception scores on triggering event items in the context of academic advising. Academic advisors witness this delay of help-seeking when students come in for assistance after a triggering event has occurred. The findings seem to suggest support for this idea, and participants reported agreement with the next steps of exploration and integration. The lower COI scores for resolution may also be attributed to the characteristics of the population, as post-traditional students may prefer to weigh their evidence and make informed decisions on their own. In other words, the role of advisor may be limited to the "informed" stages (exploration and integration of new knowledge) of the decision-making process (Table 2), based on the individual characteristics of the online student population.

RQ 2. Discussion of COI and Demographic Analysis

Although there were no significant differences found after an examination of demographic criteria and COI, items of importance were discovered. In the majority of cases, agreement occurred throughout the demographic groups with the ranking of social presence first, teaching presence second, and cognitive presence third. Demographic information collected included gender, age, ethnicity, race, number of courses completed towards a degree, number of completed courses online (other and current institution) and start term (measuring time with an advisor which was mandatory at the researched institution). The sample included larger populations of females, whites, juniors, and seniors. Unfortunately, there were small sizes in other demographic categories.

Unique to COI research, social presence ranked first, followed by teaching presence, and cognitive presence. Garrison (2011) defined social presence "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 by way of projecting their individual personalities" (p. 34). Although unique, the high perception of social presence in online academic advising was not a surprise for two significant reasons. The first reason was the possible influence of time with an advisor, and the second reason was the possible influence of depth of online experience.

Findings suggested that as time with advisor increased, social presence means increased. This intuitively made sense to the researcher, as advising practices support quality interactions and inquiry, which is the purpose of social presence (Garrison & Arbaugh, 2007). Academic advising also provides a long-term support relationship for the duration of their student life-cycle (NACADA, 2010). The advising-counseling continuum seems to infer the potential impact of

time in an advisee/advisor relationship, where the flow of support and knowledge can shift from informational to complex developmental approaches. Time, regarding the relationship with an advisor, was defined by a self-reported start term and date. Registration required mandatory advising appointments per semester. Use caution when making assumptions about time with an advisor in future research if appointments are not mandatory for each term of enrollment. In that case, additional questions may be necessary to gauge time with an advisor.

The concept of the depth of online experience influencing social presence is not new to the COI literature. Previous research on long-term Ed.D. cohorts, where students formed and maintained a strong bond with others, revealed an increased social presence over time, between year one and two (Kumar & Ritzhaupt, 2014). In this research, online courses completed at other institutions and the researched institutions captured the depth of online experience a student had. Findings support the idea that as the number of completed online classes increased, social presence did as well. Most of the participants 59.5% reported being in their third year, or more, at the institution.

This study could be the first COI research that extends the possible influence of time (including the length of time with an advisor and online course experience) on social presence out to the five-year mark. Institutions might need to ensure time with online advisees is adequate, especially at the beginning, mirroring main campus efforts for special student populations like first generation and freshman students.

RQ 3. COI and Importance Rankings

Research question three asked was there a positive relationship in scores of COI and its elements and Importance rankings. There is a positive relationship between Importance and COI. Any item ranked higher in Importance than COI agreement would immediately indicate an

area that needed further attention, but there were none. Importance and COI did not find agreement for the highest mean at any level (presence, category, or item). Overall findings suggested that students perceived items of COI as important. Importance mean scores ranged from 3.24 to 4.14 on a Likert scale where 3 = *important,*4 = *very important*, and 5 = *extremely important*. However, there is more to explore with Importance and COI. Participants ranked the Importance of items based on their values, experiences, and expectations. Academic advising practice may find areas of conflict between their institution and meeting student needs. First, their institution provides a mission and values that translate into some basic foundational expectations and best practices for advising. Second, understanding student perceptions of their online learning environment can reveal student needs that were not anticipated by the institution. The slight differences between importance and COI means at the presence, category and item level illuminated potential subtle differences between where the student is currently, and whether academic advising anticipated their important needs effectively.

Implications of Findings

- A gap in research encompassing the intersection of online learning theoretical frameworks, intentional use of technology, and online academic advising literature was identified. This study of COI and online academic advising aimed to start laying the foundation to bridge the gap.
- The results of this study suggested that advised students perceived online academic advising as part of their online learning community (COI). Additionally, participants indicated that they felt their advisor was present for them, they felt comfortable participating, interacting, and disagreeing in discussions with their advisor,

Additionally, they felt a connection with their online community, and the online environment was found to be an excellent medium for social interaction.

- This research offers a new opportunity to holistically evaluate academic advising programs, identifying both strengths and weaknesses.
- Individual annual performance reviews and goal setting could reflect departmental advising goals to improve weaknesses identified through the COI survey. Program strength in key areas could help inform personal development goals for new advisors or assist in the development of advisor handbooks or strategic continuity plans (succession planning). Best practices and operational guidance may be impacted by the survey results, especially if items of importance reveal areas where advisors require more flexibility to meet the needs of admitted students or diverse populations.
- The academic advising COI instrument, in combination with the original COI instrument, may offer scalable assessment opportunities to holistically assess the institutions online learning environment from the student's perspective. Costs are time and staff related, as the COI instrument has a Creative Commons license and is an open resource (COI, 2017).
- Time and relationship building is necessary when assisting advisees in complex tasks. Type of technology used for communication was not as important as time.

Recommendations for Practice in Context

In assessing online academic advising experiences through COI, several potential opportunities come to light. Professional development and training could be designed around expressed student needs, as categorized by the academic advising COI items. Advising practices, staff development, and learning resources could be improved at the unit level, based on

academic advising COI results. For example, item 12 was *the academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives*. Providing feedback can be a taught skill. The assessment of strengths and weaknesses requires additional learning resources focused on student development, and the setting of goals and objectives requires a developmental advising approach. Also, COI results could influence individual assessment, providing a list of skills and practices that span the advising-counseling continuum from informational to developmental.

Additionally, sharing the assessment findings could also open opportunities for collaboration with online faculty advisors on training and offer coordinated assessment in the future. For example, an additional survey question could ask about declared degree choice, and the online advising unit could collaborate with the college or department administrators, and faculty advisors. In other words, management could benefit from the program evaluation possibilities, advisors could benefit from professional assessment activities, and academic departments could also benefit from an informed understanding of their online students.

Recommendations for Future Research

The Council for the Advancement of Standards in higher education (CAS, 2013) suggested that evidence gathered through an assessment process should be used to create strategies for improvement of program and services. NACADA's (2018) Research Agenda had a two-fold approach. The first approach concerned an assessment and study of *context*, which they defined as the use of technologies in engaging students in advising. Second, NACADA (2018) encouraged the exploration of theoretical approaches outside academic advising. Expansion into new fields could further strengthen connections between advising and higher education's learning mission. In this research, online students utilized the COI framework, which focused on

the student's perceptions of their online learning environment to report their perceptions of academic advising experiences. This exploratory research could satisfy both CAS and NACADA assessment blueprints, however additional research is necessary.

Type of institution. Research needs to include a variety of institutional types. This research study focused on a research institution, land grant, four-year university. Higher education institutions range from public to private, and from community colleges to doctorate-granting institutions. Institutions also vary by mission, and those who serve online students are called upon to consider the assessment of academic advising in the online learning environment within the larger population of students served.

Population. Research needs to include a more diverse population. The online college undergraduate population and sample had a majority of females, whites, and twenty-five to thirty-four-year-olds. The majority experienced online courses at other institutions before transferring to the researched four-year institution. Recommendations include the study of larger samples of minority and multiracial students within the advising COI framework. Another recommendation focuses research on larger sample sizes of first-year students and lower classmen. Academic advising has focused attention on first generation, transfer students, international students, academically high risk, developmental course students, and post-traditional adult learners to name a few. Although a majority of the participants were over the age of 24 in a bachelor degree program, non-traditional students were not the specific interest of this initial research, and any of these groups could be the focus of future research. Other research could include additional learning-formats (cohort) or student technology competence.

Academic advising/other fields. Conduct research in various academic or student service departments. The COI instrument was modified to align with academic advising for this

study. Dedicated one-on-one advisor-advisee relationships could be compared with an advising center, where a pool of advisors assists online students. Frequency of interactions, length of appointment, or advisor technology competence could also be included in future research.

A more robust study of units serving online students is recommended, across the institution. In the COI literature research, libraries and tutoring services have been studying the one-on-one application and validity of the COI. In addition to expanding the COI research to include the field of academic advising, other areas of expansion could include career services, student success coaches, new student call centers, and other academic or administrative units that serve online students. For example, research at multiple institutions could study transfer student advising for online students transitioning from community college to a four-year institution.

A longitudinal study following students through the timeline to completion. The recommendation for future research includes a longitudinal study, conducted to follow students through their online timeline to completion for several reasons. First, COI, as focused in the online classrooms, has a limited amount of time and therefore longitudinal studies have not been conducted through the context of online classrooms or program evaluation. Second, for COI in the advising context, a longitudinal study could reveal changes over time in specific items, categories, or presence. Implementation of specific measures could address any reported critical items of importance as students travel through the student life-cycle. Items of importance could gain further clarity with an assessment of first-time enrolled advising. The first appointment could serve as a baseline for future assessments.

Type of advisor. Advising crosses boundaries between professional and administrative staff and faculty. Faculty serves as a touch point along the semester in the classroom, and outside in the hallways with virtual office hours. For online students, a worn copy of a syllabus

with contact details might offer a lifeline of support through email and phone. This research did not include faculty advisors, as professional staff advisors advised online undergraduate students. However, if faculty advisors advise online students, they should be included.

Advising models and structures. Depending on the level of degrees, such as graduate work, the institution type, or the model of advising an institution used for online students, there is a matrix of options for advising models. This research focused on a total-intake model with full-time professional staff advisors, within an Online College, under the Academic Affairs organizational structure. Many of the 2011 NACADA survey respondents said they advised under modified models of advising. Advising model organizational concepts included decentralized, centralized, and shared models. With national studies reporting only 17.1% of institutions using faculty advisors, and only 16% of institutions using the total-intake model in 2011 (Carlstrom & Miller, 2013), there is much room for future research. A national research study on academic models used for online students is also a recommendation for future research. Additionally, research could include academic advising programs that are not housed under an online college, or under academic affairs.

Online Learning Environment. Finally, collaboration between online faculty and online advisors could achieve a deeper understanding of the student's holistic online environment at the institution. An online unit could utilize the original COI (focused on online learning in classrooms) in combination with the academic advising COI, to gain valuable insight into the broader learning environment an online student experiences.

Reflections, Description of Experience, and Lessons Learned

I started this adventure as an active duty army spouse with three kids under the age of eight, and as a survivor of three deployments with my husband away. I had personal experiences

with web conferencing at a distance to war zones with little kids on my lap. First crawls and first words were witnessed and heard over web conferencing. I took those personal experiences to heart when I started a job that focused on serving online students in my region. As an online graduate student, I have also experienced the flood of email communications a university can generate to students. Athletics, campus events, student council, student organizations, along with important advisor emails, deadline notices from the registrar, and balance updates from finance all fill the inbox. Working with online students as a professional staff member, and my personal experiences, drove this topic for my dissertation research. I struggled the most with finding a theory that encompassed the unique qualities of online learning and experiences. I found some surprises along the way and will continue to research COI and academic advising, so this is just the start for me.

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Appendix A - Institutional Review Board Approval

Please note that any institutional identifying marks such as signature lines, letterhead, or text have been removed or redacted to prevent identification of the research population.

DATE: 12/18/2017

RE: Proposal Entitled, "The community of inquiry framework and academic advising: online student perceptions"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for [redacted] University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: #2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are [redacted] students, to the Director of the Student Health Center.

Appendix B - Approval Letter to Study Sample

Please note that any institutional identifying marks such as signature lines, letterhead, or text have been removed or redacted to prevent identification of the research population.

To Whom It May Concern:

This letter serves as permission for Laura Stermer, PhD student in Adult Learning & Leadership, to study online undergraduate degree-seeking students enrolled in the spring 2018 semester of [redacted] These students will be sent an electronic survey via their [redacted] email address & via Canvas as follows:

> First, Global Campus will encourage participation in the study the 2nd week of class, on January 22, 2018 via student emails. Second, the survey introduction letter and survey link will be provided in Canvas email notification, due by Feb 16. Staff involvement, (not researcher involvement) for the learning management system, and in sending mass student emails complies with FERPA regulations and IRB policies. In other words, the researcher will not have access to personal student identification data, in recruiting students to participate, or through survey answers. The follow-up reminder in Canvas in Spring 1, week 4, February 5th will include a note to encourage participation from academic advisors. A final notice using student emails will be sent with a week to go, Feb 9th, before the deadline of midnight, 16 February.

Appendix C - Student Survey Letter

January 22, 2018

Online Academic Advising Program Survey
[Insert Survey Hyper link here]

Dear Spring 2018 Online student,

Happy New Year! Help us to evaluate the Online Academic Advising Program, your opinion is important! Impact future enhancements to academic advising, with your timely response.

The purpose of this study is to gather valuable information for the online academic advising program. This study aims to explore the perception of online academic advising examined through the Community of Inquiry framework focused on teaching presence, cognitive presence and social presence.

I greatly appreciate your participation in this study, the deadline to complete the survey is February 16, 2018, Midnight CST. The survey should take approximately 15-20 minutes of your time. Your responses should be based on your experience as online student with academic advising. This is not meant to measure your opinion of ideal roles or relationships, but instead should be based on personal experience, observations, and discussions with your academic advising as an online student.

This research has been approved by the University Institutional Review Boards (IRB). Using the hyperlink below protects your student email from being captured. Your responses will not be aligned with your name or any personal identifiers, *or your academic advisor*. Your participation is strictly voluntary. Questions that make the participant uncomfortable may be skipped.

If you have any questions you can direct them to the researcher at stermer@school.edu.

Sincerely,

Laura Stermer
School, Adult Learning and Leadership PhD candidate

Major Professor and Principal Investigator: Dr. Jane Fishback
Student Survey Letter

Appendix D - Online AA CoI Survey

Online Academic Advising Community of Inquiry Survey

Note. *name of institution removed; ** name of online college removed to protect sample

Demographic Questions [move to back when entered in Qualtrics]

1. What is your gender?
    a. Female
    b. Male
2. Are you Hispanic or Latino? (Choose only one)
    a. No, not Hispanic or Latino
    b. Yes, Hispanic or Latino

The above question is about ethnicity, not race. No matter what you selected above, please answer the question below, by marking one or more boxes to indicate what you consider your race(s) to be.

3. How would you describe yourself? (Choose one or more racial group(s))
    a. American Indian or Alaska Native - A person having origins in any of the original peoples of North and South America (including Central America), and who maintains a tribal affiliation or community attachment
    b. Asian - A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including the peoples, for example, of Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam
    c. Black or African American - A person having origins in any of the black racial groups of Africa – includes Caribbean Islanders and others of African origin
    d. Native Hawaiian or Other Pacific Islander - A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands
    e. White - A person having origins in any of the original peoples of Europe, the Middle East, or North Africa

4. What is your age?
    a. $\leq$ 24
    b. 25-34
    c. 35-44
    d. 45-54
    e. $\geq$ 55

5. Approximately how many online courses have you successfully completed at other institutions?
    a. 0-5
    b. 6-10
    c. 11-15
    d. 16-20
    e. More than 20

6. Approximately how many online courses with *this institution have you successfully completed?
    a. 0-5
    b. 6-10
    c. 11-15
    d. 16-20
    e. More than 20

7. Approximately when was your first ** online class?
   dropdown choices for term and date: [semester][2000-2018]

8. What is the number of courses you have successfully completed to date towards your degree?
    a. Freshman (0-29 hours)
    b. Sophomore (30-59 hours)
    c. Junior (60-89 hours)
    d. Senior (90+)

9. I have had advising appointment(s) with a ** advisor using the following technologies (mark all that apply):
    a. Phone/ TDD
    b. Web conferencing (Zoom, Skype)
    c. Other: _____
    d. None

10. Please rate and comment on your experience with these technologies on how they influence your academic advising experience: [a, b or c will populate from Q9]
    a. Rating of Phone/ TDD Appointment:
       Very Dissatisfied, Dissatisfied, Neutral, Satisfied, Very Satisfied

Please comment on your experience using Phone for advising appointments: (open ended) _____

b. Rating of Web conferencing (Zoom, Skype):
Very Dissatisfied, Dissatisfied, Neutral, Satisfied, Very Satisfied

Please comment on your experience using Web conferencing for advising appointments: (open ended) _____

11. I prefer advising appointments using: (choose only one)
    a. Phone/ TDD
    b. Web conferencing (Zoom, Skype)

Academic Advising Community of Inquiry Statements

Instructions: On the following statements, you will be asked to respond to each statement with two answers, agreement and importance to you. Please focus on ** advising when answering these questions.

Explanation of *Academic Success* strategies/learning activities: An advisor may encourage you to complete self-assessments or career assessments, recommend alternate resources such as orientation or tutoring, or provide a referral for additional services. Time management, study skills, and life balance may be included under academic success strategies, as well as many others.

Click TWICE for each item:

First, please comment on the statement using the following options:
strongly disagree, disagree, neutral, agree, strongly agree

Second, please rank the importance of each statement using the following options:
unimportant, somewhat important, important, very important, extremely important

12. The academic advisor communicated important academic success strategies clearly.
13. The academic advisor communicated important academic success goals clearly.
14. The academic advisor provided clear instructions on how to participate in academic success learning activities.
15. The academic advisor communicated important due dates/time frames clearly.
16. The academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn.

17. The academic advisor assisted in guiding me towards understanding academic success strategies in a way that helped me clarify my thinking.
18. The academic advisor kept me engaged and participating in productive dialogue.
19. The academic advisor kept me on task in a way that helped me to learn.
20. The academic advisor encouraged me to explore new concepts.
21. Academic advisor actions reinforced the development of a sense of community within **
22. The academic advisor focused the discussion on relevant issues in a way that helped me to learn.
23. The academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives.
24. The academic advisor responded in a timely fashion.
25. I have gotten to know my academic advisor, adding to my sense of belonging in **
26. I formed distinct impressions about my academic advisor.
27. Online or web-based communication is an excellent medium for social interaction.
28. I felt comfortable conversing through the online medium.
29. I felt comfortable participating in academic success discussions.
30. I felt comfortable interacting with my academic advisor.
31. I felt comfortable disagreeing with my academic advisor while still maintaining a sense of trust.
32. My point of view was acknowledged by my academic advisor.
33. Advising discussions helped me to develop a sense of collaboration.
34. Questions posed increased my interest in academic success strategies.
35. Academic success activities engaged my curiosity.
36. I was motivated to explore resources suggested by my academic advisor.
37. I utilized a variety of information sources to explore questions posed by my academic advisor.
38. Exploring relevant information helped me resolve advising related questions.
39. Advising discussions were valuable in helping me appreciate different perspectives.
40. Integrating new information helped me answer questions raised by my academic advisor.
41. Reflecting about academic advising discussions helped me understand fundamental concepts for my academic success.

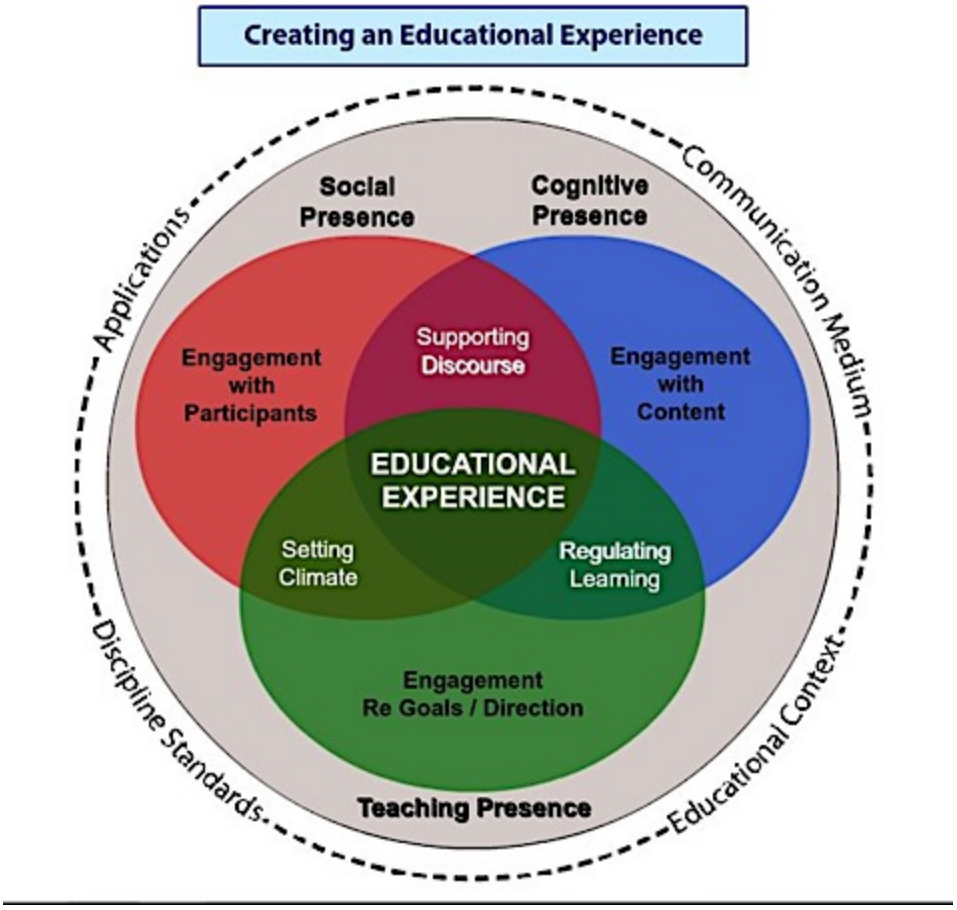
42. Academic success activities helped me construct explanations and solutions.
43. I evaluated the applicability of solutions learned through academic advising.
44. I developed solutions to academic success problems that can be applied in practice.
45. I applied strategies learned through academic advising to my work or other non-class related activities

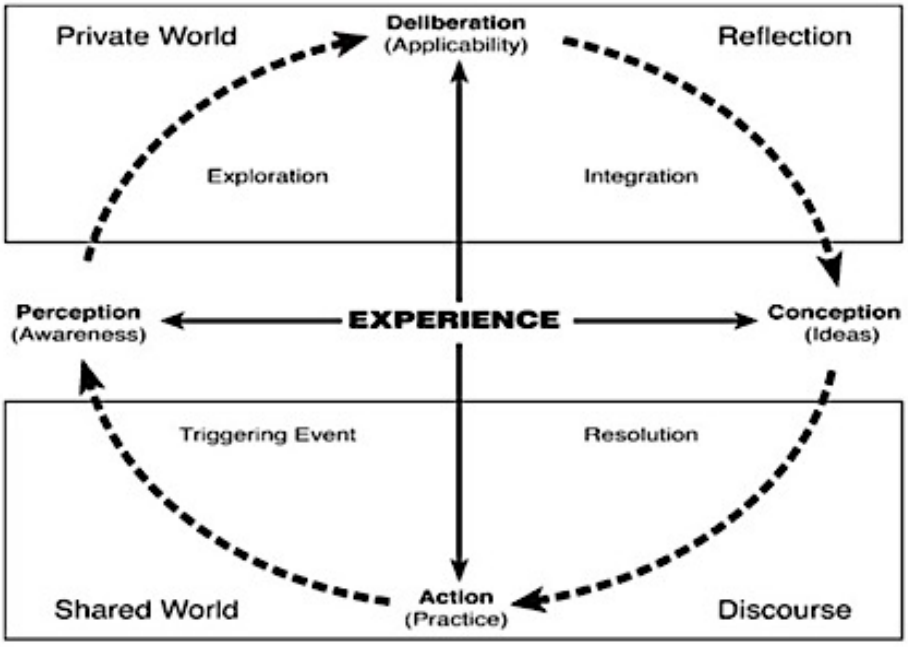
Appendix E - Approval for COI and Practical Inquiry Framework Figures

From: D. Randy Garrison
Sent: Sunday, June 18, 2017 8:29 AM
To: Stermer, Laura Duncan
Subject: RE: Request to use Community of Inquiry Framework and Practical Inquiry Model figures in dissertation

Laura,
I am very pleased to hear that the CoI framework is providing the theoretical foundation for your research.
You have my permission to use the Community of Inquiry Framework and Practical Inquiry Model figures in your dissertation.
I will see if we can include a statement about the use of CoI figures on the CoI websites including the blog.
We all look forward to seeing a description of your research project on the blog.
All the best,
DRG

D. Randy Garrison
Professor Emeritus
University of Calgary
https://coi.athabascau.ca/


Creating an Educational Experience
Social Presence
Cognitive Presence
Applications
Communication Medium
Engagement with Participants
Supporting Discourse
Engagement with Content
EDUCATIONAL EXPERIENCE
Setting Climate
Regulating Learning
Engagement Re Goals / Direction
Teaching Presence
Discipline Standards
Educational Context


Private World
Deliberation (Applicability)
Reflection
Exploration
Integration
Perception (Awareness)
EXPERIENCE
Conception (Ideas)
Triggering Event
Resolution
Shared World
Action (Practice)
Discourse

Appendix F - Intentional Use of Technology Approval

From: George Steele
Sent: Saturday, June 17, 2017 7:31 AM
To: Stermer, Laura Duncan
Cc: George Steele
Subject: Re: Request to use Model for Intentional Use of Technology figures in dissertation

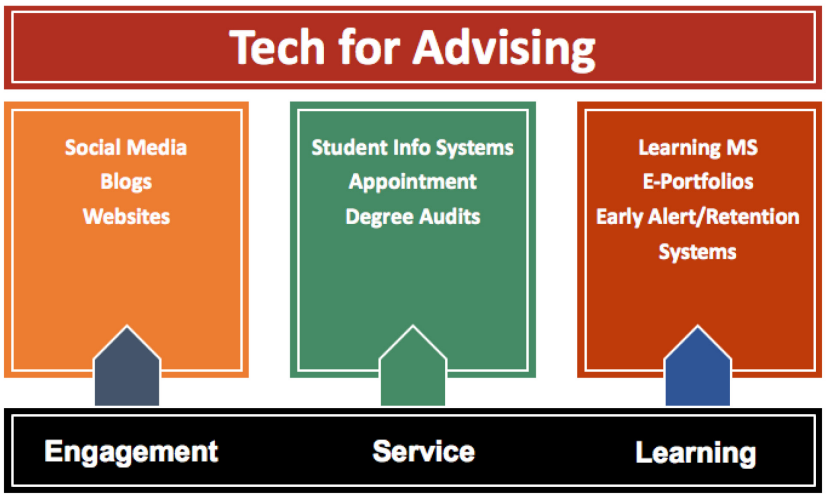
Please feel free to use the image Laura.
You might also want to use the one below, because this simplifies the model of intentionality. The first image was from the article

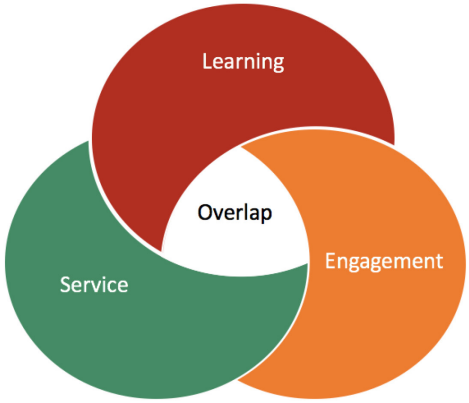
Steele, G. (2016c). Don't pass on iPASS: Recalibrate it for teaching and learning. *NACADA Clearinghouse of Academic Advising Resources.* Retrieved from https://www.nacada.ksu.edu/Resources/Clearinghouse/View-Articles/Dont-Pass-on-iPASS-Re-Calibrate-it-for-Teaching-and-Learning-a6416.aspx

These next two images are slight modifications of the model I used in recent presentation. The attempt here was to simplify it some so it would be easier to comprehend.

Good luck with your writing Laura! Let me know if you want to discuss your research.

Best,
George





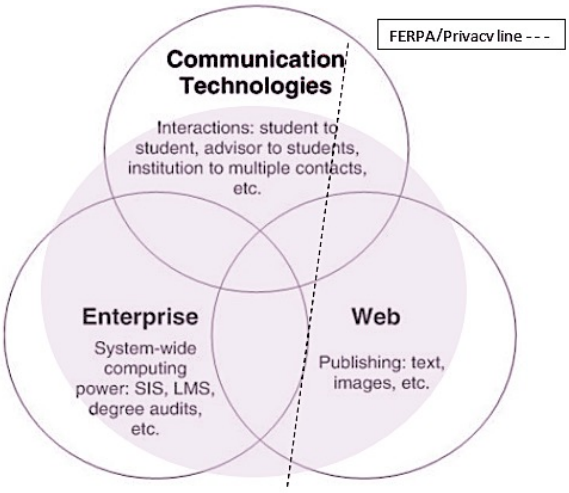
On Jun 16, 2017, at 9:25 PM, Stermer, Laura Duncan wrote:

Dr. George Steele,

Would it be possible to use the following figures in my dissertation? I will note that they are adapted from your (2014) article of course. I will also include this email in my appendix, if you approve this request.

First, I have constructed a basic version of your model that I start the section off with, that includes just the three technology categories (communication, enterprise, web-based) and the FERPA line.

Second, I would like to copy and use Image 4 from your article titled: Three areas of intentional application of technology to advising goals…



Appendix G - EBSCO Subject Databases Searched

Table G.1

EBSCO Subject Databases searched

Applied Science & Technology	Full Text	(H.W. Wilson)	Publications
Business Abstracts	Full Text	(H.W. Wilson)	Publications
Communication & Mass Media	Full Text	(H.W. Wilson)	Publications
Education	Abstracts	(H.W. Wilson)	Publications
Education	Full Text	(H.W. Wilson)	Publications
Humanities & Social Sciences Index Retrospective: 1907-1984	Index	(H.W. Wilson)	Publications
Humanities	Full Text	(H.W. Wilson)	Publications
Library Literature & Information Science	Full Text	(H.W. Wilson)	Publications
Library Literature & Information Science	Index	(H.W. Wilson)	Publications
Library Literature, Information Science & Technology	Abstracts	(H.W. Wilson)	Publications
OmniFile	Full Text	(H.W. Wilson)	Publications
Social Sciences	Abstracts	(H.W. Wilson)	Publications
Social Sciences	Full Text	(H.W. Wilson)	Publications

Appendix H - Search Criteria, Selection, & Exclusion Steps

Appendix I illustrates the search, exclusion, and retention from each database (EBSCO, ProQuest, Sage and Google Scholar).

Table H.1

The Boolean search results for: Conferencing AND ("online learning" OR "Distance Education") AND "higher education"

Search Results	Google Scholar	EBSCO	ProQuest	Sage "DE"	Sage "OL"
General Review					
Boolean Search		860	456	205	142
Peer Review		560	199	168	121
Scholarly Journal		558	176	168	121
Published 2012-2017		73	35	21	38
Published 2007-2011		+144	+51		
In English	41	217	86	21	38
Title Review					
Duplication of Results	-5	-88	-4		
Duplication of RefWorks	-1	-22	-63	0	-6
Retained	35	107	19	21	32
Abstract Review					
No original data	-2	-12	-3	-2	-5
Not Web conferencing	-4	-18	-5	-4	-12
Not higher education	-3	-9	-1	-3	-5
Not online	-7	-28	-7	-3	-4
Retained	19	40	3	9	6
Article Review					
Not web conferencing	-2	-18	0	-2	-3
No original data	0	-13	-1	-2	0
Retained	17	9	2	5	3
Last search date:	11/2018	11/2018	11/2018	11/18	11/18

Exclusion criteria included: (a) not related to web conferencing, (b) no original data, (c) not written in English, and (d) not related to online students. Inclusion criteria in this literature review were: (a) published after 2007, (b) published in a peer-reviewed journal, (c) addresses online students, (d) current web conferencing technology, and (e) higher education. As part of the search for landmark and review articles, the reference section of retained articles was examined for additional related literature and cross-referenced for those who had multiple citations. Two university library databases (Carnegie classified Research 1 and a Research 2 institution) as well as Google Scholar, an online database, were used to find articles and trace the lineage back to first generation (seminal) references from current article citations. Table 8 confirmed the difficulty with terminology, revealing that almost a third (n=25) of the retained articles from the abstract review (n=77) were eliminated after reading the articles. In other words, the description of the technology did not match the definition of current web conferencing technology.

Appendix I - Population Chart

Table I.1

Spring one, 2018 term population: online undergraduate student by characteristics

	Gender M=male F=female	Fresh.	Soph.	Jr.	Sr.	Age Range and Mean (M)	Percentage of undergraduate students
American Indian	M =1		1			31	
American Indian	F= 2			1	1	21	3 = 0.8%
Asian	M=2				2	35-41, M=38	
Asian	F=11		2	2	7	22-44, M=34	13 = 2.76%
Black	M=5			1	4	29-47, M=35	
Black	F=15	1	1	1	12	22-47, M=32	20 = 7.59%
Hawaiian Pacific Islander	M=0						
Hawaiian Pacific Islander	F=1			1		20	1 = 0.11%
Hispanic	M=8	1		2	5	25-46, M=34	
Hispanic	F=17		2	2	13	25-52, M=32	25 = 9.09%
Multiracial	M=5		1	2	2	22-46, M=34	
Multiracial	F=13		2	1	10	20-58, M=31	18 = 3.56%
Not Identified	M=2		1		1	37-46, M=42	
Not Identified	F=6				6	22-38, M=29	8 = 1.61%
White	M=56		2	7	47	21-51, M=30	
White	F=232	3	12	40	176	18-56, M=30	288 = 74.45%
Male Population	78	1	5	12	61	21-51, M=32	79 = 20.7%
Female Population	29	4	19	48	226	18-58, M=30	298 = 78.3%
NET	376	5	24	60	287	18-58, M=31	376 = 100%

Note. Erickson, P. (January 23, 2018). Spring 2018. Personal communication [email].

Appendix J - Additional Survey Information

Qualitative transcript analysis did not capture student perception of COI presence (McKerlick et al., 2011). Analysis of the COI framework (Leader-Janssen et al., 2016) from a student perspective was necessary to further the field of COI research, which pushed the development of a quantitative instrument. Credited with the first quantitative COI survey, Garrison et al. (2004) tested a 28-item survey, but items were found to cross load on more than one factor, possibly due to the small sample size (*n*=65). Arbaugh et al. (2008) tested his version of a COI survey in 2007, with mixed validity results (*n*=667, MBA students). Students responded to questions using a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The cumulative scores ranged from 0 (no perceived presence) to 170 (the highest measure of presence). The COI website granted permission "free of charge, to any person obtaining a copy of the CoI survey to use, share, copy, adapt, merge, publish or distribute the document in any medium or format for any purpose, provided that appropriate credit is given, and any modified material is distributed under the same Creative Commons license" (COI, 2017, para 3.).

Original COI survey versus statement modifications for advising.

Note: Original COI Survey Questions adapted from COI (2017). Community of inquiry [website]. Retrieved May 28, 2017 from https://coi.athabascau.ca

Comparison of Original CoI statements with Academic Advising modifications

O# designates Original COI statement one
A# designates Academic Advising modifications

O1. The instructor clearly communicated important topics.
A1. The academic advisor communicated important academic success strategies clearly.
Edit note: moved "clearly" to end for grammatical reason

O2. The instructor clearly communicated important course goals.
A2. The academic advisor communicated important academic success goals clearly.
Edit note: moved "clearly" to end for grammatical reason

O3. The instructor provided clear instructions on how to participate in course learning activities.
A3. The academic advisor provided clear instructions on how to participate in academic success learning activities.

O4. The instructor clearly communicated important due dates/time frames for learning activities.
A4. The academic advisor communicated important due dates/time frames clearly.
Edit note: moved "clearly" to end for grammatical reason

O5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.
A5. The academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn.
Edit note: changed passive voice "was helped" to "assisted"

O6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking
A6. The academic advisor assisted in guiding me towards understanding academic success strategies in a way that helped me clarify my thinking.
Edit note: changed passive voice "was helped" to "assisted"

O7. The instructor helped to keep course participants engaged and participating in productive dialogue.
A7. The academic advisor kept me engaged and participating in productive dialogue.
Edit note: changed passive voice "helped to keep" to "kept"

O8. The instructor helped keep the course participation on task in a way that helped me to learn.
A8. The academic advisor kept me on task in a way that helped me to learn.

Edit note: changed passive voice “helped to keep” to “kept”

O9. The instructor encouraged course participants to explore new concepts in this course.
A9. The academic advisor encouraged me to explore new concepts.

O10. Instructor actions reinforced the development of a sense of community among course participants.
A10. Academic advisor actions reinforced the development of a sense of community within * online college name

O11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.
A11. The academic advisor focused the discussion on relevant issues in a way that helped me to learn.
Edit note: changed passive voice “helped to focus” to “focused”

O12. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the courses’ goals and objectives.
A12. The academic advisor’s feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives.
Edit note: changed “provided feedback that” to “feedback”

O13. The instructor provided feedback in a timely fashion.
A13. The academic advisor responded in a timely fashion.
Edit note: cognitive interviews reported “feedback” as an instructor term, “responded” for advisor role was more appropriate

O14. Getting to know other course participants gave me a sense of belonging in the course.
A14. I have gotten to know my academic advisor, adding to my sense of belonging in * online college name

O15. I was able to form distinct impressions of some course participants.
A15. I formed distinct impressions about my academic advisor.
Edit note: changed passive voice “was able to form” to “formed”

O16. Online or web-based communication is an excellent medium for social interaction.
A16. Online or web-based communication is an excellent medium for social interaction.

O17. I felt comfortable conversing through the online medium.
A17. I felt comfortable conversing through the online medium.

O18. I felt comfortable participating in the course discussions.
A18. I felt comfortable participating in academic success discussions.
O19. I felt comfortable interacting with other course participants.
A19. I felt comfortable interacting with my academic advisor.

O20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.
A20. I felt comfortable disagreeing with my academic advisor while still maintaining a sense of trust.

O21. I felt that my point of view was acknowledged by other course participants.
A21. My point of view was acknowledged by my academic advisor.
Edit note: removed "I felt that" to strengthen statement

O22. Online discussions help me to develop a sense of collaboration.
A22. Advising discussions helped me to develop a sense of collaboration.

O23. Problems posed increased my interest in course issues.
A23. Questions posed increased my interest in academic success strategies.

O24. Course activities piqued my curiosity.
A24. Academic success activities engaged my curiosity.

O25. I felt motivated to explore content related questions.
O25. I was motivated to explore resources suggested by my academic advisor.

O26. I utilized a variety of information sources to explore problems posed in this course.
A26. I utilized a variety of information sources to explore questions posed by my academic advisor.

O27. Brainstorming and finding relevant information helped me resolve content related questions.
A27. Exploring relevant information helped me resolve advising related questions.
Edit note: in interviews "brainstorming and finding" were considered two separate items. After consulting the practical inquiry model figure, the term "exploring" was used.

O28. Online discussions were valuable in helping me appreciate different perspectives.
A28. Advising discussions were valuable in helping me appreciate different perspectives.

O29. Combining new information helped me answer questions raised in course activities.
A29. Integrating new information helped me answer questions raised by my academic advisor.
Edit note: in interviews *combining new information* was confusing with questions of "with what?" After consulting the practical inquiry model figure, the term "integrating" was used.

O30. Learning activities helped me construct explanations/solutions.
A30. Academic success activities helped me construct explanations and solutions.

O31. Reflection on course content and discussion helped me understand fundamental concepts in this class.
A31. Reflecting about academic advising discussions helped me understand fundamental concepts for my academic success.

O32. I can describe ways to test and apply the knowledge created in this course.
A32. I evaluated the applicability of solutions learned through academic advising.
Edit note: changed passive voice "can describe" to "evaluated". In interviews "test and apply" were considered two separate items, and classroom terminology. After consulting the practical inquiry model figure, the phrase "the applicability" was used.

O33. I have developed solutions to course problems that can be applied in practice.
A33. I developed solutions to academic success problems that can be applied in practice.
Edit note: changed passive voice "have developed" to "developed"

O34. I can apply the knowledge created in this course to my work or other non-class related activities
A34. I applied strategies learned through academic advising to my work or other non-class related activities
Edit note: changed passive voice "can apply" to "applied"

Modifications have become standard practice. For example, over the last several years researchers who have used the COI survey instrument, outside of the original context of the online classroom, have made modifications. In exploring a 3D virtual world with avatars, McKerlick et al. (2011) changed the teaching presence element items to include "while teaching in a virtual world" (p.331). The term *course* has been modified in questions to "units," which referred to smaller modules within the course (Oyarzun & Morrison, 2013, p.188). While on a larger scale, *course* was modified to the *program*, which referred to an entire degree such as a doctoral cohort (Kumar & Rizhaupt, 2014) or graduate program (Leader-Janssen et al., 2016). To accommodate additional technology tools, the terms *online medium* or *course discussion* was changed to "web conferencing" in five questions (Stover & Miura, 2015). Additionally, the term *instructor* has been modified to *instructors* to capture the sense of teaching presence across a graduate programs faculty (Leader-Janssen et al., 2016).

In addition to making modifications in the wording of individual questions, other customizations to Arbaugh et al. (2008) COI survey have been reported. McKerlick et al. (2011)

removed four questions not relevant to the virtual world environment. Others included open-ended questions to gain additional insights from their participants (Leader-Janssen 2016; Stover & Miura, 2015). Finally, adding demographic or descriptive questions allowed the results to be reported by race, gender, age, number of online courses taken, and identification of treatment group (Oyarzun & Morrison, 2013).

Additional Descriptive Questions.

Demographic Questions:

1. What is your gender?
    a. Female
    b. Male
    c. Male
2. Are you Hispanic or Latino? (Choose only one)
    a. No, not Hispanic or Latino
    b. Yes, Hispanic or Latino

The above question is about ethnicity, not race. No matter what you selected above, please answer the question below, by marking one or more boxes to indicate what you consider your race(s) to be.

3. How would you describe yourself? (Choose one or more racial group(s))
    a. American Indian or Alaska Native - A person having origins in any of the original peoples of North and South America (including Central America), and who maintains a tribal affiliation or community attachment
    b. Asian - A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including the peoples, for example, of Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam
    c. Black or African American - A person having origins in any of the black racial groups of Africa – includes Caribbean Islanders and others of African origin
    d. Native Hawaiian or Other Pacific Islander - A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands
    e. White - A person having origins in any of the original peoples of Europe, the Middle East, or North Africa

4. What is your age?
    a. ≤ 24
    b. 25-34
    c. 35-44
    d. 45-54
    e. ≥ 55
5. Approximately how many online courses have you successfully completed at other institutions? (5 categories)
6. Approximately how many online courses with the online college have you successfully completed? (5 categories)
7. When was your first (research institution's name) online class? (defined by online college's starting term and year, dropdown choices: [semester][yyyy])
8. What is the number of credit hours you have successfully completed to date?
    a. Freshman (0-29 hours)
    b. Sophomore (30-59 hours)
    c. Junior (60-89 hours)
    d. Senior (90+)
9. I have had advising appointment (s) using the following technologies (mark all that apply):
    a. Phone
    b. Web conferencing (Zoom, Skype)
    c. Other: _____
    d. None
10. [Note: this probing question will have populated in Qualtrics for any answer of a, b, or c in Question 8] Please rate and comment on your experience with these technologies on how they influence your academic advising experience:
    a. Phone rating:
    Very Satisfied, Satisfied, Dissatisfied, Very Dissatisfied, Never Used
    b. Please comment on your experience using Phone for advising appointments:
    (open ended) _____
    c. Web conferencing (Zoom, Skype) rating:
    Very Satisfied, Satisfied, Dissatisfied, Very Dissatisfied, Never Used
    d. Please comment on your experience using Phone for advising appointments:
    (open ended) _____
11. I prefer advising appointments using: (choose only one)
    a. Phone
    b. Web conferencing (Zoom, Skype)

Reliability of the Original COI Instrument.

For the original COI instrument (refer to Appendix I), Arbaugh et al. (2008) measured teaching presence in the COI survey by the first 13 questions (Cronbach Alpha the measure of internal consistency $\alpha = .96$), while social presence was measured by the next nine questions ($\alpha = .92$). Cognitive presence was measured by the final 13 questions ($\alpha = .95$). Arbaugh et al. (2008) study included education and business graduate students ($n = 287$), with a 43% response rate over four institutions. Diaz et al. (2010) importance was scored using an ordinal scale with 5 = *extremely important*, 4 = *very important*, 3 = i*mportant*, 2 = *somewhat important*, and 1 = *unimportant*.

Appendix K - Approval for COI Importance Rankings

From: Swan, Karen
Sent: Wednesday, August 23, 2017 1:24 PM
To: Stermer, Laura Duncan
Subject: RE: Request to use Diaz et al. (2010) Importance Ranked COI survey in dissertation research

Yes, you may

From: Stermer, Laura Duncan
Sent: Wednesday, August 23, 2017 12:38 PM
To: Swan, Karen
Subject: RE: Request to use Diaz et al. (2010) Importance Ranked COI survey in dissertation research

Dr. Swan,

Thank you, I didn't want to use the survey with the importance ranking that you all developed for my dissertation research, and not seek prior permission. May I confirm that I have permission to include the importance rankings in with the COI survey that I modify?

Thank you,
Laura Stermer

Appendix L - Dr. Garrison Response to Modifications of COI Survey

From: D. Randy Garrison
Sent: Monday, December 18, 2017 2:08 PM
To: Stermer, Laura Duncan
Subject: RE: Status update on CoI Survey for Academic Advising - Laura Stermer Dissertation

Laura,
My apologies for a slow response (email got lost amongst others).
Your modifications seem more than reasonable.
All the best,
DRG

D. Randy Garrison
Professor Emeritus
University of Calgary
CoI Website: https://coi.athabascau.ca/
BLOG: http://www.thecommunityofinquiry.org/community

From: Stermer, Laura Duncan
Sent: Saturday, December 09, 2017 1:46 PM
To: D. Randy Garrison
Subject: Status update on CoI Survey for Academic Advising - Laura Stermer Dissertation

Dr. Garrison,
I wanted to follow up with since my initial email … I've made to the CoI statements in the survey.

I wanted to share those modifications with you, if I may. I am open to any feedback you may share on the modifications. The sample will be online degree seeking undergraduate students in the spring semester, term one, 2018, who are served through a central advising office with staff advisors, not faculty advisors.

Please advise if you have any concerns. The survey won't launch until 22 January.

Sincerely,
Laura Stermer

Appendix M - Quantitative Scoring for Original COI Survey Items

Answer options: 1=*strongly disagree*, 2=*disagree*, 3=*neutral*, 4=*agree*, 5=*strongly agree*

Teaching Presence (items 1-13)

Design and Organization

1. The instructor clearly communicated important topics.
2. The instructor clearly communicated important course goals.
3. The instructor provided clear instructions on how to participate in course learning activities.
4. The instructor clearly communicated important due dates/time frames for learning activities.

Facilitation

5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking
7. The instructor helped to keep course participants engaged and participating in productive dialogue.
8. The instructor helped keep the course participation on task in a way that helped me to learn.
9. The instructor encouraged course participants to explore new concepts in this course.
10. Instructor actions reinforced the development of a sense of community among course participants.

Direct Instruction

11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.
12. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the courses' goals and objectives.
13. The instructor provided feedback in a timely fashion.

Social Presence survey items (14-22)

Affective Expression

14. Getting to know other course participants gave me a sense of belonging in the course.
15. I was able to form distinct impressions of some course participants.
16. Online or web-based communication is an excellent medium for social interaction.

Open Communication

17. I felt comfortable conversing through the online medium.
18. I felt comfortable participating in the course discussions.
19. I felt comfortable interacting with other course participants.

Group Cohesion

20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.
21. I felt that my point of view was acknowledged by other course participants.
22. Online discussions help me to develop a sense of collaboration.

Cognitive Presence survey items (23-34)

Triggering Event

23. Problems posed increased my interest in course issues.
24. Course activities piqued my curiosity.
25. I felt motivated to explore content related questions.

Exploration

26. I utilized a variety of information sources to explore problems posed in this course.
27. Brainstorming and finding relevant information helped me resolve content related questions.
28. Online discussions were valuable in helping me appreciate different perspectives.

Integration

29. Combining new information helped me answer questions raised in course activities.
30. Learning activities helped me construct explanations/solutions.
31. Reflection on course content and discussion helped me understand fundamental concepts in this class.

Resolution

32. I can describe ways to test and apply the knowledge created in this course.
33. I have developed solutions to course problems that can be applied in practice.
34. I can apply the knowledge created in this course to my work or other non-class related activities.

Appendix N - A Priori Codes and Classifications for COI Survey

COI	*Categories* & Indicators
Teaching Presence	1. *Design and Organization* Examples: (a) Setting curriculum, (b) Designing methods, establishing time parameters, (c) Utilizing medium effectively, (d) Establishing netiquette, and (e) Making macro-level comments about course content. 2. *Facilitating Discourse* Examples: (a) Identifying area of agreement/disagreement, (b) Seeking to reach consensus/understanding, (c)Encouraging, acknowledging, or reinforcing student contributions, (d) Setting climate for learning, (e) Drawing in participants, prompting discussion, and (f) Evaluating the effectiveness of the process. 3. *Direct Instruction* Examples: (a) Presenting content/questions, (b) Focusing the discussion on specific issues, (c) Summarizing the discussion, (d) Confirming understanding through assessment and explanatory feedback, (e) Diagnosing misconceptions, (g) injecting knowledge from diverse sources, and (h) Responding to technical concerns.
Social Presence	1. *Interpersonal Communication* Examples: (a) Affective expressions, (b) Self-disclosure, and (c) Use of humor. 2. *Open Communication* Examples: (a) Continuing a thread, (b) Quoting from other messages, (d) Asking questions, (e) Complimenting, expressing appreciation, and (f) Expressing agreement. 3. *Group Cohesion* Examples: (a) vocatives – a noun that identifies a person, (b) Addresses or refers to the group using inclusive pronouns, and (c) Social expressions, salutations.
Cognitive Presence	1. Triggering Event Examples: (a) Recognizing problem and (b) Puzzlement. 2. Exploration Examples: (a) Divergence, (b) Information exchange, (c) Suggestions, (d) Brainstorming, and (e) Intuitive leaps. 3. Integration Examples: (a) Convergence, (b) Synthesis, and (c) Solutions. 4. Resolution Examples: (a) Applying, (b) Testing, and (c) Defending.

Appendix O - Formula for Calculating Length of Time From Start Term

Appendix O explains the formula to be used in calculating the length of time with academic advisor using the reported start term and year.

Question asks: First (name of institution) online class by: [semester][yyyy]

Answer reports length of time with (online college name) academic advisor.

Calculate by assigning academic year (AY) status as it relates to your survey date, for each year you have participants:

- AY 2017-2018 = Fall 2017 + Spring 2018, there is no Summer 2018 yet
- AY 2016-2017 = Fall 2016 + Spring 2017 + Summer 2017
- Try to split the oldest academic year so "n" is reasonable and include any outliers who remain
- AY 2013-2014 = Fall 2013+Spring 2014+Summer 2014 (n=6) + Summer 2013 (n=1), and Fall of 2012 (n=1) and Fall 2011 (n=1)

Appendix P - Sample - Participant Personal Variables

Table P.1

Sample participant personal variables

Category / Sub Category		Sample *n*	Sample % of responses	Population *N*	Population % of population
Total Students		87		374	
Gender	Female	62	71.3%	298	79.3%
	Male	10	11.5%	78	20.7%
	No Response	15	17.2%	0	
Age					
	18-24	15	17.2%	90	24.0%
	25-34	33	37.9%	180	48.0%
	35-44	27	31.0%	77	20.5%
	45-54	12	13.8%	27	7.0%
	$\geq$ 55	1	1.1%	2	0.5%
Ethnicity					
	No, Not Hispanic or Latino	68	78.2%		
	Yes, Hispanic or Latino	4	4.6%	25	9.09%
	No response	15	17.2%		
Race					
	American Indian or Alaska Native	1	1.1%	3	.08%
	Asian	7	8.1%	13	2.76%
	Black or African American	4	4.6%	20	7.59%
	Native Hawaiian or Other Pacific Islander	0	0	1	.11%
	White	54	62.1%	288	74.45%
	Multi-racial	5	5.7%	18	3.56%
	No Response	16	18.4%	8	1.61%

Note. from Erickson, P. (January 23, 2018). Spring 2018 Population. Personal communication [email].

Appendix Q - Research Question One Tables

Note: Items are numbered to match the COI survey items, so that comparisons can be made between the individual advising items and any other COI research.

Table Q.1

RQ 1.a.1 Technology Preference and Teaching Presence: Design and Organization

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*			
Design and Organization	80	4.18	.962	43	4.28	.878	25	3.97	1.15	.859	-1.42	1.76
1. The academic advisor communicated important academic success goals clearly.												
	80	4.20	.900	43	4.30	.856	25	4.0	1.04	.914	-1.49	1.85
2. The academic advisor communicated important academic success strategies clearly.												
	80	4.18	.946	43	4.26	.921	25	4.04	1.05	.679	-.980	1.28
3. The academic advisor provided clear instructions on how to participate in academic success learning activities.												
	80	3.94	1.11	43	4.07	.983	25	3.56	1.08	.969	-2.18	2.48
4. The academic advisor communicated important due dates/time frames clearly.												
	80	4.40	.875	43	4.49	.733	25	4.28	1.08	.859	-.883	1.31

Table Q.2

RQ 1.a.2 Technology preference and Teaching Presence: Facilitation

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*			
Facilitation	80	3.95	1.02	43	4.08	.956	25	3.69	1.20	1.02	-1.72	2.12
5. The academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn.	80	3.84	1.05	43	3.86	1.03	25	3.60	1.16	.173	-1.56	1.39
6. The academic advisor assisted in guiding me towards understanding academic success in a way that helped me clarify my thinking.	80	4.05	1.05	43	4.19	.980	25	3.76	1.24	1.05	-1.83	2.22
7. The academic advisor kept me engaged and participating in productive dialogue.	80	3.98	.935	43	4.07	.904	25	3.80	1.07	.808	-1.26	1.59
8. The academic advisor kept me on task in a way that helped me to learn.	80	3.98	1.00	43	4.05	.966	25	3.84	1.13	.571	-.918	1.15
9. The academic advisor encouraged me to explore new concepts.	80	3.91	1.09	43	4.14	1.0	25	3.60	1.30	1.70	-1.89	2.70
10. Academic advisor actions reinforced the development of a sense of community within the *online campus	80	3.96	1.01	43	4.19	.844	25	3.52	1.28	1.89	-2.78	3.58

Note. * In the survey the online college was specifically named but was protected here to avoid identification of the research population. Items are numbered to match the COI survey items, so that comparisons can be made between the individual advising items and any other COI research.

Table Q.3

RQ 1.a.3 Technology Preference and Teaching Presence: Direct Instruction

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*			
Direct Instruction	80	4.14	.932	44	4.23	.890	25	3.92	1.04	.813	-1.60	1.88
11. The academic advisor focused the discussion on relevant issues in a way that helped me to learn.												
	80	3.99	.929	43	4.12	.904	25	3.76	1.02	1.10	-1.69	2.16
12. The academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives.												
	79	3.94	1.08	43	4.00	1.06	25	3.60	1.18	.462	-2.14	2.08
13. The academic advisor responded in a timely fashion.												
	80	4.49	.758	43	4.58	.662	25	4.40	.899	1.03	-.763	1.34

Table Q.4

RQ 1.b.1 Technology Preference and Social Presence: Affective expression

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
	n	*M*	*S*	*n*	*M*	*S*	*n*	*M*	*S*			
Affective Expression	85	4.01	.986	43	4.22	.869	25	3.81	1.13	1.77	-1.39	2.34
14. I have gotten to know my academic advisor, adding to my sense of belonging in *online campus	85	3.92	1.08	43	4.16	.994	25	3.60	1.21	1.89	-2.06	2.97
15. I formed distinct impressions about my academic advisor.	85	4.05	.957	43	4.26	.778	25	3.88	1.12	1.91	-1.19	2.27
16. Online or web-based communication is an excellent medium for social interaction.	85	4.07	.918	43	4.23	.818	25	3.96	1.04	1.49	-.834	1.69

Note. * In the survey the online college was specifically named but is protected here to avoid identification of the research population. Items are numbered to match the COI survey items, so that comparisons can be made between the individual advising items and any other COI research.

Table Q.5

RQ 1.b.2 Technology preference and Social Presence: Open Communication

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
	n	*M*	*S*	*n*	*M*	*S*	*n*	*M*	*S*			
Open Communication	85	4.31	.890	43	4.47	.761	25	4.12	1.02	1.61	-1.44	2.29
17. I felt comfortable conversing through the online medium.												
	85	4.40	.843	43	4.56	.677	25	4.24	1.00	1.66	-1.28	2.17
18. I felt comfortable participating in academic success discussions.												
	85	4.18	.897	43	4.35	.793	25	3.96	1.06	1.63	-1.63	2.42
19. I felt comfortable interacting with my academic advisor.												
	85	4.34	.927	43	4.51	.807	25	4.16	.983	1.57	-1.41	2.28

Table Q.6

RQ 1.b.3 Technology Preference and Social Presence: Group Cohesion

	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
Category and items	*n*	*M*	*S*	*n*	*M*	*S*	*n*	*M*	*S*			
Group Cohesion	85	4.03	.948	43	4.14	.853	25	3.91	1.18	.995	-.839	1.32
20. The academic advisor communicated important academic success strategies clearly.	85	3.82	.923	43	3.93	.853	25	3.68	1.17	.961	-1.01	1.43
21. The academic advisor communicated important academic success goals clearly.	85	4.18	.935	43	4.33	.784	25	4.0	1.18	1.38	-1.23	1.90
22. The academic advisor provided clear instructions on how to participate in academic success learning activities.	85	4.08	.985	43	4.16	.917	25	4.04	1.18	.676	-.289	.676

Table Q.7

RQ 1.c.1 Technology Preference and Cognitive Presence: Triggering Event

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
	n	*M*	*S*	*n*	*M*	*S*	*n*	*M*	*S*			
Triggering Event	84	3.81	1.00	43	3.92	.984	25	3.73	1.05	.906	-.547	1.08
23. Questions posed increased my interest in academic success strategies.												
	84	3.81	.969	43	3.91	.965	25	3.80	.980	.803	-.072	.641
24. Academic success activities engaged my curiosity.												
	84	3.70	.985	43	3.88	.986	25	3.48	1.09	1.47	-1.58	2.27
25. I was motivated to explore resources suggested by my academic advisor.												
	84	3.92	1.05	43	3.98	1.00	25	3.92	1.09	.467	.023	.316

Table Q.8

RQ 1.c.2 Technology Preference and Cognitive Presence: Exploration

	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
Category and items	*n*	*M*	*S*	*n*	*M*	*S*	*n*	*M*	*S*			
Exploration	84	3.85	.996	43	3.95	.988	25	3.85	.947	.810	.006	.604
26. I utilized a variety of information sources to explore questions posed by my academic advisor.	84	3.80	.985	43	3.91	1.04	25	3.80	.894	.862	.019	.645
27. Exploring relevant information helped me resolve advising related questions.	84	3.87	.936	43	4.02	.915	25	3.88	.909	1.33	.088	.916
28. Advising discussions were valuable in helping me appreciate different perspectives.	83	3.89	.1.06	42	3.93	1.01	25	3.88	1.03	.296	-.081	.287

Table Q.9

RQ 1.c.3 Technology Preference and Cognitive Presence: Integration

Category and items	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
	n	*M*	*S*	*n*	*M*	*S*	*n*	*M*	*S*			
Integration	84	3.83	.980	43	3.95	.972	25	3.64	1.06	1.05	-1.34	1.80
29. Integrating new information helped me answer questions raised by my academic advisor.	84	3.79	1.01	43	3.91	1.01	25	3.64	1.06	.953	-1.04	1.50
30. Academic success activities helped me construct explanations and solutions.	84	3.74	.989	43	3.93	.945	25	3.44	1.10	1.58	-2.10	2.78
31. Reflecting about academic advising discussions helped me understand fundamental concepts for my academic success.	84	3.95	.937	43	4.02	.955	25	3.84	1.01	.597	-.850	1.09

Table Q.10

RQ 1.c.4 Technology Preference and Cognitive Presence: Resolution

	Overall Score			Phone/TDD			Web conference			Phone vs COI Effect Size	Web vs COI Effect Size	Phone vs Web Effect Size
Category and items	*n*	*M*	*S*	*n*	*M*	*S*	*n*	*M*	*S*			
Resolution	84	3.67	1.03	43	3.84	.967	25	3.4	1.16	1.36	-1.85	2.43
32. I evaluated the applicability of solutions learned through academic advising.												
	84	3.82	.990	43	4.02	.872	25	3.56	1.09	1.72	-1.85	2.73
33. I developed solutions to academic success problems that can be applied in practice.												
	84	3.86	1.05	43	4.02	.966	25	3.52	1.25	1.31	-2.16	2.63
34. I applied strategies learned through academic advising to my work or other non-class related activities.												
	84	3.35	1.04	43	3.49	1.05	25	3.12	1.13	1.09	-1.53	1.97

Table Q.11

Teaching Presence Mann-Whitney U-test

Teaching Presence: Categories & numbered items	*U*	*z*	*p*-value
Design and Organization			
1. The academic advisor communicated important academic success goals clearly.	447	1.15	0.25
2. The academic advisor communicated important academic success strategies clearly.	474	0.81	0.42
3. The academic advisor provided clear instructions on how to participate in academic success learning activities.	431	1.36	0.17
4. The academic advisor communicated important due dates/time frames clearly.	495	0.54	0.59
Facilitation			
5. The academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn.	468	0.88	0.38
6. The academic advisor assisted in guiding me towards understanding academic success in a way that helped me clarify my thinking.	436	1.29	0.20
7. The academic advisor kept me engaged and participating in productive dialogue.	463	0.95	0.34
8. The academic advisor kept me on task in a way that helped me to learn.	490	0.60	0.55
9. The academic advisor encouraged me to explore new concepts.	411	1.61	0.11
10. Academic advisor actions reinforced the development of a sense of community within the *online campus	369	2.41	0.03
Direct Instruction			
11. The academic advisor focused the discussion on relevant issues in a way that helped me to learn.	426	1.72	0.15
12. The academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives.	426	1.42	0.16
13. The academic advisor responded in a timely fashion.	482	0.71	0.48

Note. α=.05

Table Q.12

Social Presence Mann-Whitney U-test

Social Presence: Categories & numbered items	*U*	*z*	*p*-value
Affective Expression			
14. I have gotten to know my academic advisor, adding to my sense of belonging in *online campus	388	1.90	0.06
15. I formed distinct impressions about my academic advisor.	449.5	1.12	0.26
16. Online or web-based communication is an excellent medium for social interaction.	468.5	0.89	0.38
Open Communication			
17. I felt comfortable conversing through the online medium.	451.5	1.09	0.27
18. I felt comfortable participating in academic success discussions.	429.5	1.37	0.17
19. I felt comfortable interacting with my academic advisor.	418.5	1.51	0.13
Group Cohesion			
20. The academic advisor communicated important academic success strategies clearly.	484.5	0.67	0.50
21. The academic advisor communicated important academic success goals clearly.	478	0.76	0.45
22. The academic advisor provided clear instructions on how to participate in academic success learning activities.	534	0.44	0.96

Note. α=.05

Table Q.13

Cognitive Presence Mann-Whitney U-test

Cognitive Presence: Categories & numbered items	*U*	*z*	*p*-value
Triggering Event			
23. Questions posed increased my interest in academic success strategies.	508.5	0.37	0.71
24. Academic success activities engaged my curiosity.	437	1.28	0.20
25. I was motivated to explore resources suggested by my academic advisor.	525.5	0.15	0.88
Exploration			
26. I utilized a variety of information sources to explore questions posed by my academic advisor.	486	0.07	0.51
27. Exploring relevant information helped me resolve advising related questions.	486.50	0.65	0.52
28. Advising discussions were valuable in helping me appreciate different perspectives.	486	0.66	0.51
Integration			
29. Integrating new information helped me answer questions raised by my academic advisor.	449.50	1.12	0.26
30. Academic success activities helped me construct explanations and solutions.	407	1.66	0.10
31. Reflecting about academic advising discussions helped me understand fundamental concepts for my academic success.	483.5	0.69	0.49
Resolution			
32. I evaluated the applicability of solutions learned through academic advising.	408.5	1.64	0.10
33. I developed solutions to academic success problems that can be applied in practice.	413	1.58	0.11
34. I applied strategies learned through academic advising to my work or other non-class related activities.	452.50	1.08	0.28

Note. α=.05

Table Q.14

Item Ranks by COI and technology preference, top 17

COI item number and statement [category]	M_{COI}	COI Rank	PH	WC
13. The academic advisor responded in a timely fashion. [DI]	4.49	1	1	1
17. I felt comfortable conversing through the online medium. [OC]	4.40 *s*=.843	2	2	3
4. The academic advisor communicated important due dates/time frames clearly. [DO]	4.40 *s*=.875	3	4	2
19. I felt comfortable interacting with my academic advisor. [OC]	4.34	4	3	4
1. The academic advisor communicated important academic success goals clearly. [DO]	4.20	5	7	7
18. I felt comfortable participating in academic success discussions. [OC]	4.18 *s*=.897	6	5	10
21. The academic advisor communicated important academic success goals clearly. [GC]	4.18 *s*=.935	7	6	8
2. The academic advisor communicated important academic success strategies clearly. [DO]	4.18 *s*=.946	8	9	5
22. The academic advisor provided clear instructions on how to participate in academic success learning activities. [GC]	4.08	9	13	6
16. Online or web-based communication is an excellent medium for social interaction. [AE]	4.07	10	10	9
15. I formed distinct impressions about my academic advisor. [AE]	4.05 *s*=.957	11	8	14
6. The academic advisor assisted in guiding me towards understanding academic success in a way that helped me clarify my thinking. [F]	4.05 *s*=1.05	12	12	20
11. The academic advisor focused the discussion on relevant issues in a way that helped me to learn. [DI]	3.99	13	16	19
7. The academic advisor kept me engaged and participating in productive dialogue. [F]	3.98 *s*=.935	14	17	34
8. The academic advisor kept me on task in a way that helped me to learn. [F]	3.98 *s*=1.00	15	19	16
10. Academic advisor actions reinforced the development of a sense of community within the *online campus [F]	3.96	16	11	30
31. Reflecting about academic advising discussions helped me understand fundamental concepts for my academic success. [IN]	3.95	17	22	15

Note. The smaller standard deviation (*s*) was used to break any ties in mean.

Table Q.15

Item Ranks by COI and technology preference, bottom 17

COI item number and statement [category]	M_{COI}	COI Rank	PH	WC
12. The academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives. [DI]	3.94 *s*=1.08	18	24	24
3. The academic advisor provided clear instructions on how to participate in academic success learning activities. [DO]	3.94 *s*=1.11	19	18	27
25. I was motivated to explore resources suggested by my academic advisor. [TE]	3.92 *s*=1.05	20	25	11
14. I have gotten to know my academic advisor, adding to my sense of belonging in *online campus [AE]	3.92 *s*=1.08	21	14	25
9. The academic advisor encouraged me to explore new concepts. [F]	3.91	22	15	26
28. Advising discussions were valuable in helping me appreciate different perspectives. [EX]	3.89	23	28	13
27. Exploring relevant information helped me resolve advising related questions. [EX]	3.87	24	21	12
33. I developed solutions to academic success problems that can be applied in practice. [R]	3.86	25	23	29
5. The academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn. [F]	3.84	26	33	23
20. The academic advisor communicated important academic success strategies clearly. [GC]	3.82 *s*=.923	27	20	28
32. I evaluated the applicability of solutions learned through academic advising. [R]	3.82 *s*=.990	28	26	21
23. Questions posed increased my interest in academic success strategies. [TE]	3.81	29	29	18
26. I utilized a variety of information sources to explore questions posed by my academic advisor. [EX]	3.80	30	31	17
29. Integrating new information helped me answer questions raised by my academic advisor. [IN]	3.79	31	30	22
30. Academic success activities helped me construct explanations and solutions. [IN]	3.74	32	27	32
24. Academic success activities engaged my curiosity. [TE]	3.70	33	32	31
34. I applied strategies learned through academic advising to my work or other non-class related activities. [R]	3.35	34	34	33

Note. The smaller standard deviation (*s*) was used to break any ties in mean.

Appendix R - Research Question Two Tables

Table R.1

RQ 2.a Gender and COI

Gender	Teaching Presence			Social Presence			Cognitive Presence			COI		
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*
Females	62	4.01	.812	62	4.18	.762	62	3.83	.887	62	4.01	.812
Males	10	3.95	.750	10	3.93	.732	10	3.68	.601	10	3.85	.646

Note. Effect size: COI 1.37, TP .993, SP 1.96, CP 1.21, all large.

Table R.2

RQ 2.a Gender and COI Mann-Whitney U-test results

	U value	*z*	*p*-value	*Mdn* female	*Mdn* male	Hypothesis
COI	254	.911	.36	4.07	3.78	Fail to reject
Teaching P	257.5	.854	.39	4.08	3.77	Fail to reject
Social P	240	1.139	.25	4.33	3.83	Fail to reject
Cognitive P	261.5	.789	.43	3.92	3.54	Fail to reject

Note. P is for presence, $\alpha=.05$.

Table R.3

RQ 2.b.1 Ethnicity and COI

Ethnicity	Teaching Presence			Social Presence			Cognitive Presence			COI		
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*
No, not Hispanic or Latino	68	4.12	.577	68	4.39	.397	68	3.75	.806	68	4.06	.598
Yes, Hispanic or Latino	4	4.05	.880	4	4.13	.777	4	3.81	.858	4	3.99	.803

Note. Effect size: COI = .61, TP = .51, SP = 2.54, CP = -.44, all medium or large.

Table R.4

RQ 2.b.1 Ethnicity and COI Mann-Whitney U-test results

	U-value	*z*	*p*-value	No Mdn	Yes Mdn	Hypothesis
COI	135.6	.012	.99	4.03	3.57	Fail to reject
Teaching P	134.5	.0368	.97	4.08	3.69	Fail to reject
Social P	113.5	.553	.58	4.33	4.11	Fail to reject
Cognitive P	125	.270	.79	3.92	3.04	Fail to reject

Note. No = No, not Hispanic or Latino; Yes= Yes, Hispanic or Latino, $\alpha=.05$.

Table R.5

RQ 2.b.2 Race and COI

Race	Teaching Presence			Social Presence			Cognitive Presence			COI		
	n		*s*	*n*	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*
AI/ AK	1	5.00	0	1	4.67	0	1	4.50	0	1	4.30	0
Asian	7	4.42	.618	7	4.48	.669	7	4.05	.691	7	4.30	.618
Black	4	4.33	.599	4	4.33	.614	4	4.29	.597	4	4.32	.601
White	54	4.02	.882	54	4.11	.784	54	3.78	.869	54	3.96	.808
Multi	5	3.63	.935	5	3.89	.692	5	3.37	.849	5	3.61	.797

Note. American Indian or Alaskan Native was shortened to AI/AK. Black of African American was shortened to Black. Multiracial was shorten to Multi. There was one AI/AK so there is zero standard deviation for their score.

Table R.6

RQ 2.b.2 Race and COI Kruskal Wallis H-test results

Race	*N*	*H*-statistic	*df*	X^2 critical	α	*H*-stat < X^2 critical?	Hypothesis
Asian	7	-10.5975	3	7.82	.05	Yes	Fail to
Black	4	-	-	-	-	-	reject
White	54	-	-	-	-	-	-
Multi	5	-	-	-	-	-	-

Note. α*=.05*

Table R.7

RQ 2.c Age and COI

Age	Teaching Presence			Social Presence			Cognitive Presence			COI		
	n	M	s	n	M	s	n	M	s	n	M	s
18-24	15	4.07	.718	14	4.13	.748	13	3.96	.684	15	4.05	.663
25-34	28	4.08	.819	31	4.13	.657	32	3.73	.740	32	3.92	.707
35-44	27	4.11	.827	27	4.22	.688	27	3.78	.913	27	4.03	.785
45-54	12	4.17	.660	12	4.10	.657	12	3.67	.810	12	4.06	.659
≥ 55	1	1.00	0	1	1.00	0	1	1.00	0	1	1.00	0

Note. There was only one participant age 55 or older, so their score is reported.

Table R.8

RQ 2.c Age and COI Kruskal Wallis H-test results

Age	*n*	*H*-statistic	*df*	X^2 critical	α	*H*-stat < X^2 critical?	Hypothesis
18-24	15	-5.88	4	9.49	.05	yes	Failed to
25-34	28	-	-	-	-	-	reject
35-44	27	-	-	-	-	-	-
45-54	12	-	-	-	-	-	-
≥55	1	-	-	-	-	-	-

Note. α=.05

Table R.9

RQ 2.d Courses complete towards degree (classification levels) and COI

Class Level	Teaching Presence			Social Presence			Cognitive Presence			COI		
	n	M	s	n	M	s	n	M	s	n	M	s
Fresh.	2	3.77	.385	2	3.84	.055	2	3.13	.124	2	3.56	.176
Soph.	2	4.43	.346	2	4.39	.389	2	4.09	0	2	4.30	.236
Junior	30	3.98	.932	30	4.13	.913	30	3.70	1.01	30	3.92	.922
Senior	39	4.07	.847	39	4.13	.668	39	3.91	.729	39	4.03	.714

Note. There was only one participant age 55 or older, so their score is reported. Effect sizes between Juniors and Seniors: COI = -.73, TP = -.59, SP = -.03, CP = -1.42.

Table R.10

RQ 2.d Classification levels: Junior versus Senior Mann-Whitney U-test results

	U value	*z*	*p*-value	Junior Mdn	Senior Mdn	Hypothesis
COI	564	.254	.80	3.91	4.09	Fail to reject
Teaching P	573	.145	.88	4.00	4.23	Fail to reject
Social P	540.5	.539	.59	4.22	4.33	Fail to reject
Cognitive P	518.5	.805	.42	3.58	3.92	Fail to reject

Note. Junior (n=30), Seniors (n=39). Freshman (n=2) and Sophomores (n=2) were too small for testing as $n < 5$, α=.05

Table R.11

RQ 2.e Online Experience at other institutions and COI

Courses	Teaching Presence			Social Presence			Cognitive Presence			COI		
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*
0-5	23	3.76	.764	23	3.83	.756	22	3.62	.728	23	3.72	.713
6-10	22	4.20	.867	22	4.22	.844	22	3.86	.823	22	4.09	.816
11-15	6	4.24	.879	6	4.24	.627	6	4.39	.511	6	4.29	.650
16-20	4	3.67	.785	4	4.28	.601	4	3.61	1.03	4	3.81	.785
20+	19	4.19	.876	19	4.30	.631	19	3.82	.954	19	4.09	.803

Table R.12

RQ 2.e Online experience at other institutions and COI Kruskal Wallis H-test results

Courses	*n*	*H*-statistic	*df*	X^2 critical	α	*H*-stat < X^2 critical?	Hypothesis
0-5	23	4.88	4	9.49	.05	Yes	Failed to
6-10	22	-	-	-	-	-	reject
11-15	6	-	-	-	-	-	-
16-20	4	-	-	-	-	-	-
20+	19	-	-	-	-	-	-

Note. α=.05

Table R.13

RQ 2.f Online Experience at institution and COI

Courses	Teaching Presence			Social Presence			Cognitive Presence			COI		
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*
0-5	12	4.02	.713	12	3.96	.690	12	3.79	.782	12	3.92	.696
6-10	18	3.92	.907	18	4.10	.924	18	3.66	.953	18	3.88	.900
11-15	17	3.89	.752	17	4.02	.748	17	3.78	.802	17	3.88	.739
16-20	17	4.11	1.02	17	4.27	.662	17	3.87	.868	17	4.07	.816
20+	9	4.53	.597	9	4.43	.493	9	4.06	.683	9	4.34	.558

Table R.14

RQ 2.f Online experience at institution and COI Kruskal Wallis H-test results

Courses	N	*H*-statistic	*df*	X^2 critical	α	*H*-stat < X^2 critical?	Hypothesis
0-5	12	3.47	4	9.49	.05	Yes	Failed to
6-10	18	-	-	-	-	-	reject
11-15	17	-	-	-	-	-	-
16-20	17	-	-	-	-	-	-
20+	9	-	-	-	-	-	-

Note. α=.05

Table R.15

RQ 2.g Start date, as measure of time at institution, with academic advising and COI

Academic Year	Teaching Presence			Social Presence			Cognitive Presence			COI		
	n	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*	*n*	*M*	*s*
AY 13-14*	12	3.74	1.03	12	3.69	1.05	12	3.48	1.03	12	3.64	1.01
AY 14-15	18	3.92	.726	18	4.05	.725	18	3.83	.803	18	3.91	.726
AY 15-16	22	3.93	.920	22	4.23	.682	22	3.72	.722	22	3.93	.729
AY 16-17	13	4.35	.658	13	4.41	.533	13	4.13	.785	13	4.29	.639
AY 17-18	9	4.44	.722	9	4.17	.340	9	3.93	.720	9	4.19	.705

Note. AY 13-14 included one student each from the start term of fall 2011, fall 2012, and summer 2013

Table R.16

RQ 2.g Start date and COI Kruskal Wallis H-test results

Years	*n*	*H*-statistic	*df*	X^2 critical	α	*H*-stat < X^2 critical?	Hypothesis
AY13-14*	12	4.90	4	9.49	.05	Yes	Failed to
AY 14-15	18	-	-	-	-	-	reject
AY 15-16	22	-	-	-	-	-	-
AY 16-17	13	-	-	-	-	-	-
AY 17-18	9	-	-	-	-	-	-

Note. AY 13-14 included one student each from the start term of fall 2011, fall 2012, and summer 2013, α*=.05*

Appendix S - Research Question Three Tables

Note: Items are numbered to match the COI survey items, so that comparisons can be made between the individual advising items and any other COI research.

Table S.1

RQ 3.a.1 Importance Ranking and Teaching Presence: Design and Organization

	Overall Score			Importance Ranking			COI and Importance Effect Size
Category and items	*n*	*M*	*s*	*n*	*M*	*s*	
Design and Organization	80	4.18	.962	84	3.94	1.18	2.02
1. The academic advisor communicated important academic success goals clearly.	80	4.20	.900	84	3.94	1.16	2.27
2. The academic advisor communicated important academic success strategies clearly.	80	4.18	.946	84	3.96	1.20	1.84
3. The academic advisor provided clear instructions on how to participate in academic success learning activities.	80	3.94	1.11	84	3.73	1.23	1.62
4. The academic advisor communicated important due dates/time frames clearly.	80	4.40	.875	84	4.14	1.13	2.33

Table S.2

RQ 3.a.2 Importance Ranking and Teaching Presence: Facilitation

Category and items	Overall Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Facilitation	80	3.95	1.02	84	3.69	1.26	2.05
5. The academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn.	80	3.84	1.05	84	3.56	1.28	2.17
6. The academic advisor assisted in guiding me towards understanding academic success in a way that helped me clarify my thinking	80	4.05	1.05	85	3.84	1.18	1.71
7. The academic advisor kept me engaged and participating in productive dialogue	80	3.98	.935	84	3.73	1.23	2.07
8. The academic advisor kept me on task in a way that helped me to learn.	80	3.98	1.00	84	3.70	1.22	2.27
9. The academic advisor encouraged me to explore new concepts.	80	3.91	1.09	84	3.73	1.27	1.38
10. Academic advisor actions reinforced the development of a sense of community within the *online campus	80	3.96	1.01	84	3.56	1.37	3.01

Table S.3

RQ 3.a.3 Importance Ranking and Teaching Presence: Direct Instruction

Category and items	Overall Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Direct Instruction	80	4.14	.932	84	3.78	1.36	2.80
11. The academic advisor focused the discussion on relevant issues in a way that helped me to learn.	80	3.99	.929	84	3.61	1.35	2.97
12. The academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives.	79	3.94	1.08	84	3.68	1.38	1.89
13. The academic advisor responded in a timely fashion.	80	4.49	.758	85	4.06	1.34	3.59

Table S.4

RQ 3.b.1 Importance Ranking and Social Presence: Affective Expression

Category and items	Overall Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Affective Expression	85	4.01	.996	87	3.56	1.23	3.74
14. I have gotten to know my academic advisor, adding to my sense of belonging in *online campus	85	3.92	1.08	87	3.62	1.18	2.46
15. I formed distinct impressions about my academic advisor.	85	4.05	.957	87	3.41	1.32	5.15
16. Online or web-based communication is an excellent medium for social interaction.	85	4.07	.918	87	3.64	1.20	3.73

Table S.5

RQ 3.b.2 Importance Ranking and Social Presence: Open Communication

Category and items	Overall Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Open Communication	85	4.31	.890	87	3.88	1.18	3.82
17. I felt comfortable conversing through the online medium.	85	4.40	.843	86	3.91	1.17	4.44
18. I felt comfortable participating in academic success discussions.	85	4.18	.896	87	3.66	1.24	4.46
19. I felt comfortable interacting with my academic advisor.	85	4.34	.927	87	4.07	1.13	2.42

Table S.6

RQ 3.b.3 Importance Ranking and Social Presence: Group Cohesion

Category and items	Overall Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Group Cohesion	85	4.03	.948	86	3.78	1.12	2.23
20. The academic advisor communicated important academic success strategies clearly.	85	3.82	.923	86	3.49	1.33	2.67
21. The academic advisor communicated important academic success goals clearly.	85	4.18	.935	87	4.01	1.13	1.52
22. The academic advisor provided clear instructions on how to participate in academic success learning activities.	85	4.08	.985	86	3.83	1.20	2.11

Table S.7

RQ 3.c.1 Importance Ranking and Cognitive Presence: Triggering Event

Category and items	Overall Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Triggering Event	84	3.81	1.00	79	3.44	1.29	2.89
23. Questions posed increased my interest in academic success strategies.							
	84	3.81	.969	79	3.47	1.26	2.73
24. Academic success activities engaged my curiosity.							
	84	3.70	.985	79	3.24	1.34	3.53
25. I was motivated to explore resources suggested by my academic advisor.							
	84	3.92	1.05	79	3.61	1.27	2.40

Table S.8

RQ 3.c.2 Importance Ranking and Cognitive Presence: Exploration

Category and items	Overall Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Exploration	84	3.85	.996	79	3.38	1.30	3.66
26. I utilized a variety of information sources to explore questions posed by my academic advisor.	84	3.80	.985	79	3.25	1.33	4.24
27. Exploring relevant information helped me resolve advising related questions.	84	3.87	.936	79	3.43	1.24	3.62
28. Advising discussions were valuable in helping me appreciate different perspectives.	83	3.89	1.06	79	3.44	1.34	3.35

Table S.9

RQ 3.c.3 Importance Ranking and Cognitive Presence: Integration

Category and items	Overall Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Integration	84	3.83	.980	79	3.41	1.26	3.36
29. Integrating new information helped me answer questions raised by my academic advisor.	84	3.79	1.01	79	3.29	1.32	3.84
30. Academic success activities helped me construct explanations and solutions.	84	3.74	.989	79	3.49	1.23	2.02
31. Reflecting about academic advising discussions helped me understand fundamental concepts for my academic success.	84	3.95	.937	79	3.46	1.23	4.05

Table S.10

RQ 3.c.4 Importance Ranking and Cognitive Presence: Resolution

Category and items	Overall Score			Importance Ranking			COI and Importance Effect Size
	n	*M*	*s*	*n*	*M*	*s*	
Resolution	84	3.67	1.03	79	3.36	1.30	2.39
32. I evaluated the applicability of solutions learned through academic advising.	84	3.82	.990	79	3.35	1.29	3.69
33. I developed solutions to academic success problems that can be applied in practice.	84	3.86	1.05	79	3.44	1.29	3.22
34. I applied strategies learned through academic advising to my work or other non-class related activities.	84	3.35	1.04	79	3.28	1.33	.053

Table S.11

Item Ranks by COI, top 17 items

COI Item [category]	M_{COI}	COI Rank	IMP Rank
13. The academic advisor responded in a timely fashion. [DI]	4.49	1	3
17. I felt comfortable conversing through the online medium. [OC]	4.40 *s*=.843	2	7
4. The academic advisor communicated important due dates/time frames clearly. [DO]	4.40 *s*=.875	3	1
19. I felt comfortable interacting with my academic advisor. [OC]	4.34	4	2
1. The academic advisor communicated important academic success goals clearly. [DO]	4.20	5	6
18. I felt comfortable participating in academic success discussions. [OC]	4.18 *s*=.897	6	14
21. The academic advisor communicated important academic success goals clearly. [GC]	4.18 *s*=.935	7	4
2. The academic advisor communicated important academic success strategies clearly. [DO]	4.18 *s*=.946	8	5
22. The academic advisor provided clear instructions on how to participate in academic success learning activities. [GC]	4.08	9	9
16. Online or web-based communication is an excellent medium for social interaction. [AE]	4.07	10	16
15. I formed distinct impressions about my academic advisor. [AE]	4.05 *s*=.957	11	29
6. The academic advisor assisted in guiding me towards understanding academic success in a way that helped me clarify my thinking. [F]	4.05 *s*=1.05	12	8
11. The academic advisor focused the discussion on relevant issues in a way that helped me to learn. [DI]	3.99	13	19
7. The academic advisor kept me engaged and participating in productive dialogue. [F]	3.98 *s*=.935	14	10
8. The academic advisor kept me on task in a way that helped me to learn. [F]	3.98 *s*=1.00	15	13
10. Academic advisor actions reinforced the development of a sense of community within the *online campus [F]	3.96	16	21
31. Reflecting about academic advising discussions helped me understand fundamental concepts for my academic success. [IN]	3.95	17	25

Table S.12

Item Ranks by COI, bottom 17 items

COI Item [category]	M_{COI}	COI Rank	IMP Rank
12. The academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives. [DI]	3.94 *s*=1.08	18	15
3. The academic advisor provided clear instructions on how to participate in academic success learning activities. [DO]	3.94 *s*=1.11	19	11
25. I was motivated to explore resources suggested by my academic advisor. [TE]	3.92 *s*=1.05	20	18
14. I have gotten to know my academic advisor, adding to my sense of belonging in *online campus [AE]	3.92 *s*=1.08	21	17
9. The academic advisor encouraged me to explore new concepts. [F]	3.91	22	12
28. Advising discussions were valuable in helping me appreciate different perspectives. [EX]	3.89	23	27
27. Exploring relevant information helped me resolve advising related questions. [EX]	3.87	24	28
33. I developed solutions to academic success problems that can be applied in practice. [R]	3.86	25	26
5. The academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn. [F]	3.84	26	20
32. I evaluated the applicability of solutions learned through academic advising. [R]	3.82 *s*=.923	27	30
20. The academic advisor communicated important academic success strategies clearly. [GC]	3.82 *s*=.990	28	23
23. Questions posed increased my interest in academic success strategies. [TE]	3.81	29	24
26. I utilized a variety of information sources to explore questions posed by my academic advisor. [EX]	3.80	30	33
29. Integrating new information helped me answer questions raised by my academic advisor. [IN]	3.79	31	31
30. Academic success activities helped me construct explanations and solutions. [IN]	3.74	32	22
24. Academic success activities engaged my curiosity. [TE]	3.70	33	34
34. I applied strategies learned through academic advising to my work or other non-class related activities. [R]	3.35	34	32

Note. The smaller standard deviation (*s*) was used to break any ties in mean.

Table S.13

Item Ranks by Importance, top 17 items

COI Item [category]	M_{IMP}	IMP Rank	COI Rank
4. The academic advisor communicated important due dates/time frames clearly. [DO]	4.14	1	3
19. I felt comfortable interacting with my academic advisor. [OC]	4.07	2	4
13. The academic advisor responded in a timely fashion. [DI]	4.06	3	1
21. The academic advisor communicated important academic success goals clearly. [GC]	4.01	4	7
2. The academic advisor communicated important academic success strategies clearly. [DO]	3.96	5	8
1. The academic advisor communicated important academic success goals clearly. [DO]	3.94	6	5
17. I felt comfortable conversing through the online medium. [OC]	3.91	7	2
6. The academic advisor assisted in guiding me towards understanding academic success in a way that helped me clarify my thinking. [F]	3.84	8	12
22. The academic advisor provided clear instructions on how to participate in academic success learning activities. [GC]	3.83	9	9
7. The academic advisor kept me engaged and participating in productive dialogue. [F]	3.73	10	14
3. The academic advisor provided clear instructions on how to participate in academic success learning activities. [DO]	3.73	11	19
9. The academic advisor encouraged me to explore new concepts. [F]	3.73	12	22
8. The academic advisor kept me on task in a way that helped me to learn. [F]	3.70	13	15
18. I felt comfortable participating in academic success discussions. [OC]	3.66	14	6
12. The academic advisor's feedback helped me understand my strengths and weaknesses relative to my academic goals and objectives. [DI]	3.68	15	18
16. Online or web-based communication is an excellent medium for social interaction. [AE]	3.64	16	10
14. I have gotten to know my academic advisor, adding to my sense of belonging in *online campus [AE]	3.62	17	21

Table S.14

Item Ranks by Importance, bottom 17 items

COI Item [category]	M_{IMP}	IMP Rank	COI Rank
25. I was motivated to explore resources suggested by my academic advisor. [TE]	3.61	18	20
11. The academic advisor focused the discussion on relevant issues in a way that helped me to learn. [DI]	3.61	19	13
5. The academic advisor assisted on identifying areas of agreement and disagreement on academic success strategies that helped me to learn. [F]	3.56	20	26
10. Academic advisor actions reinforced the development of a sense of community within the *online campus [F]	3.56	21	16
30. Academic success activities helped me construct explanations and solutions. [IN]	3.49	22	32
20. The academic advisor communicated important academic success strategies clearly. [GC]	3.49	23	28
23. Questions posed increased my interest in academic success strategies. [TE]	3.47	24	29
31. Reflecting about academic advising discussions helped me understand fundamental concepts for my academic success. [IN]	3.46	25	17
33. I developed solutions to academic success problems that can be applied in practice. [R]	3.44	26	25
28. Advising discussions were valuable in helping me appreciate different perspectives. [EX]	3.44	27	23
27. Exploring relevant information helped me resolve advising related questions. [EX]	3.43	28	24
15. I formed distinct impressions about my academic advisor. [AE]	3.41	29	11
32. I evaluated the applicability of solutions learned through academic advising. [R]	3.35	30	27
29. Integrating new information helped me answer questions raised by my academic advisor. [IN]	3.29	31	31
34. I applied strategies learned through academic advising to my work or other non-class related activities. [R]	3.28	32	34
26. I utilized a variety of information sources to explore questions posed by my academic advisor. [EX]	3.25	33	30
24. Academic success activities engaged my curiosity. [TE]	3.24	34	33