

Improving Retention Factors and Student Success Online Utilizing the Community of Inquiry Framework's Instructor Presence Model

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Abstract

Considerable research on effective instruction in the virtual classroom exists. Yet very little is known about the extent to which instructor presence (IP) based on the Community of Inquiry model (CoI), are directly related to retention and student success. CoI includes three components of IP: teaching (TP), cognitive (CP), and social (SP). These IP engagement strategies have been suggested to improve outcomes if effectively applied in the virtual classroom. Attrition rates, retention, engagement, and student and instructor success rates are critical aspects of an effective virtual classroom and identifying practices that support these efforts is essential. This study suggests that CoI engagement strategies, when applied by instructors to the online classroom effectively, can improve factors associated with retention and success. To prepare instructors, we designed and utilized a series of seven self-paced interactive modules. With the training, the educators were able to engage with students more effectively by integrating best practices associated with IP. Course dropout rates and student success rates both significantly improved ($p = .05$; $p < .001$ respectively) after these engagement strategies were more efficaciously integrated into the classroom by the trained instructors.

Keywords: Instructor presence, instructor effectiveness, retention, student success, Community of Inquiry (CoI)

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The number of online courses has surged over the past 20 years, increasing concerns about effectiveness and retention (Lee & Choi, 2016; Sorensen & Donovan, 2017). In 2017, there were over six million students enrolled in online courses (U.S. Department of Education, 2019). This is an increase of two million students over a five-year period (U.S. Department of Education, 2017). Although student enrollment in secondary education has dipped, students taking courses solely online grew by 15.4% (Lederman, 2018). In addition, 35.3% of post-secondary students in the U.S. were enrolled in online institutions (National Center for Education Statistics' Integrated Postsecondary Education Data System, 2018).

Online classes are growing in popularity as students and employers recognize the flexibility and value of these courses. Now, given the COVID-19 pandemic, many higher learning institutions were forced to shift to offering courses online and this trend may permanently drive more students to earn credits or entire degrees online (Gallagher & Palmer, 2020; Smalley, 2020). While online courses offer students flexibility and increased health safety, there remains the issue of student retention and success at the postsecondary level that all institutions will have to address. Researcher and educational stakeholders must acknowledge that “the necessity for improving quality teaching has never been as compelling” (Saroyan & Trigwell, 2015, p. 92).

Literature Review

Student Retention and Success

Student retention and success have been common concerns for traditional as well as online educational institutions (Gyrurko et al., 2016; Lee & Choi, 2011; Sorensen & Donovan, 2017; Tinto, 2012); however, it has been suggested that online learning has predominantly more challenges in these areas than traditional learning institutions (Allen & Seaman, 2015; U.S. Department of Education, 2019). Identifying ways to improve these factors has been a common thread of research since online education has become a viable option for learners (Allen & Seaman, 2017; Sorensen & Donovan, 2017).

Understanding why students drop out of school is important in learning how to improve retention rates (Bawa, 2016; Sorensen & Donovan, 2017; Tinto, 2012). Retention rates are described as the number of students who return to the same university year after year to continue their education (National Student Clearinghouse Research Center, 2019). One factor affecting retention is course dropout rates. Dropout rates have been defined in numerous ways, but essentially whether a student drops from a course, or from the institution, the consequences to retention are similar (Xavier & Meneses, 2020). Data underscore that 40% to 80% of online students drop out of school prior to completing their degrees, which is suggested to be 10% to 20% higher than students attending traditional institutions (Christensen & Spackman, 2017). Hart et al. (2017) found that students were less likely to succeed in online courses than they were in face-to-face formats, even with the same instructor. This disproportion has increased the need for those in higher education to more effectively identify how to better support students with the goal of earning their degree online (Xavier & Meneses, 2020). Hence, strategies that address specific dropout factors as well as success are important considerations for online learning institutions.

The Drop Factor

“To improve retention rates, a better understanding as to why students drop out of online education is needed” (Sorensen & Donovan, 2017, p. 207). The research suggests many factors for why students leave school, including personal situations (Evans, 2020), job-related issues, feelings of isolation (Collins et al., 2019; Lederman, 2020), a lack of belonging, competence, and autonomy (Chen & Jang, 2010), self-efficacy (Bawa, 2016), motivation (Lederman, 2020), and depleted resources and support (Stoessel et al., 2015). But addressing the factors as separate components may not be the solution. Lee and Choi (2011) researched retention associated with online learning for a decade and suggested that no one factor is a primary cause for dropping out of school. Rather they suggest that it is an “interaction of numerous factors that eventually lead to a student to complete or not complete a course” (Lee & Choi, 2011, p. 615).

The Pass Factor

One important factor related to retention and course progression is course success (Chang & Kim, 2021; Hart et al., 2017). Students who struggle to pass their courses often experience financial challenges, are in jeopardy of being on academic probation, and eventually drop out. Hart et al. (2017) suggests that students taking courses online have lower course success than traditional students do, further supporting the importance of addressing how to support online learners in passing their courses.

Engagement

Both student and instructor engagement have been connected to retention and student success (Collins et al., 2019; Rosser-Majors et al., 2021). Gray and DiLoreto (2016) suggest that “active learning and student engagement is imperative for increased student learning and ultimately retention” (para. 4). However, this engagement must be encouraged and purposefully applied by the instructors (Garrison et al., 2000; Gray & DiLoreto, 2016); the research suggests it is one of the most important variables affecting student learning and outcomes (Collins et al., 2019; Gray & DiLoreto, 2016), as successful faculty engagement positively influences retention and student satisfaction in online programs (Anderson & Elloumi, 2008; Garrison, 2009; U.S. Department of Education, 2019). However, effective training about engagement is an important element in the preparation of online instructors (Gyurko et al., 2016).

Although effective engagement with students is necessary by instructors, professional development opportunities aligned to crucial areas of teaching practices is rarely offered (Lackey, 2011; Palloff & Pratt, 2013). Bawa (2016) suggests that institutions are not doing enough to develop instructors to better support students’ needs in the online learning context and suggest that institutions tend to just create more courses with higher enrollment numbers. In addition, identifying what constitutes successful faculty engagement can be challenging (Mandernach et al., 2015; Sliwinski & Rosser-Majors, 2018). The key proponents of instructor presence (IP) engagement strategies based on the CoI model suggest that instructor engagement is vital in contributing to the “dynamics of an online educational experience” (Garrison et al., 2010, p. 6), yet the satisfaction and efficacy of an instructor must also be considered, as this variable too, can affect an instructor’s quality of teaching (Dietrich, 2015; Holzberger et al., 2013; Toropova et al., 2020) even with effective development, as well as the sustainability of the engagement strategies learned.

Instructor Efficacy and Satisfaction

Although teaching quality has a direct correlation to the learning environment, its sustainability can also be affected by instructor satisfaction (Toropova et al., 2020) and self-efficacy (Holzberger et al., 2013), which in turn, affects an instructor's level of interaction with students (Jamieson & Shaw, 2019). Numerous factors impact instructor satisfaction negatively in the online classroom: i.e., large time commitment, the challenge level (Seaton & Schwier, 2014), the increased workload (Bolliger & Wasilik, 2009), lack of student relationships (Lloyd et al., 2012), and the efficacy for mastering online teaching (Buchanan et al., 2013), which is also suggested to “influence the amount of stress and anxiety that people experience as they engage in an activity” (Doménech-Betoret et al., 2017, para 4).

For those who teach online, personal satisfaction and growth are reported to be highly important to one's rationale for teaching online (Green et al., 2009). Other factors suggested to contribute to instructor satisfaction include serving vulnerable populations who may not otherwise have a chance to earn a college degree (Dufner, 2018), and being valued and respected for their work by university leadership (Friedman et al., 2017). Hence, personal, psychological, environmental, institutional, technical, and pedagogical factors should all be considered when developing strategies that increase efficacy (Holzberger et al., 2013; Toropova et al., 2020). Hence, an important course design element is the deliberate acknowledgment of time-in-class restraints and how the course structure can better support the level of instructor engagement that is necessary to engage online learners successfully. The assessment of the level of instructor satisfaction in this modality is crucial to maintaining sustainability that supports student success and retention factors (Al-Samarraie et al., 2018; Dietrich, 2015).

COI: An Engagement Processing Model Utilizing Instructor Presence Applications

Instructor presence, based on CoI, comprises the interactive teaching engagement strategies based on cognitive, teaching, and social presences, and has been suggested to be a key factor in improving students' success and retention in online learning environments (Dixon, 2010; Rebeor et al., 2019). Each area of presence relies on the others to effectively improve engagement and motivation in an online course. It is much more than logging into class on a regular basis or replying to a student in a way that does not encourage meaningful thought or further exploration. Effective IP is composed of TP, SP, and CP and the coordination of all three of these components is critical in the online classroom. CoI is directly related to instructor behaviors which attempt to increase critical thought and deeper application by students.

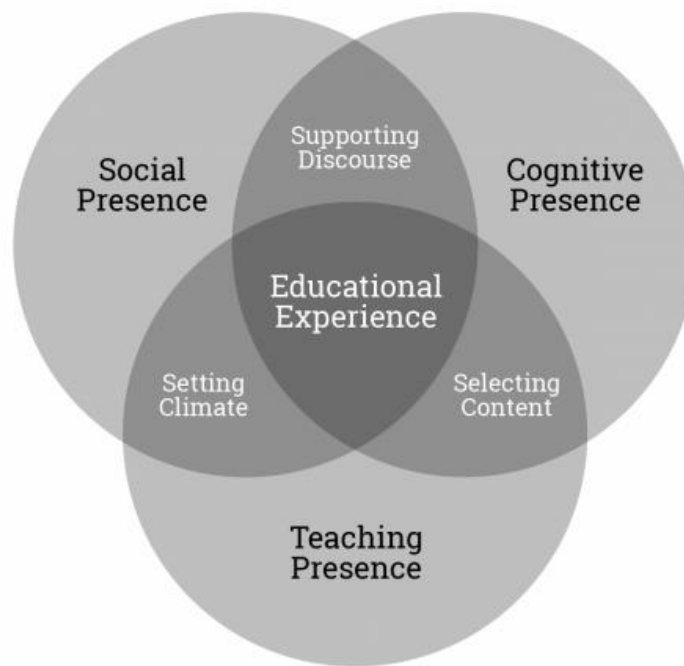
IP based on CoI, is founded on the seminal work of John Dewey (1859-1959) and has been a predominant foundation for research in online learning since the late 1990s (e.g., Dixon [2010], Popescu & Badea [2020], and Krzyszkowska & Mavrommati [2020]), and has been accommodated to numerous research projects. In fact, the CoI model “is one of the most extensively used frameworks in online teaching and learning” (Castellanos-Reyes, 2020, p. 558).

The basic premise and goal of this model of formal education...was the creation and sustainability of a community of inquiry. The goal was to define, describe and measure the elements...The framework attempted to outline not only...social, cognitive, and teaching presence...but also the dynamics of an online educational experience (Garrison, 2009, p. 5).

The engagement strategies associated with IP are diverse (Garrison et al., 2009), and they have been applied to online learning for over the past two decades (Popescu & Badea, 2020). During this time, researchers have modified, recreated, and repurposed the IP (CoI) components to reflect advancing technological applications as well as researched-based findings associated with online learner needs (Garrison et al., 2009). However, the original CoI model (Garrison et al, 1999) (Figure 1), as applied to this research, suggests that three elements, TP, SP, and CP are essential to “the quality of the educational experience and learning outcomes” (p. 92) and instructor engagement in the online course context.

Figure 1

The Community of Inquiry Model (CoI)



Note. CoI suggests that IP includes social, cognitive, and teaching presence. Each component supports the other through the application of appropriate discourse, the setting of the online learning environment’s climate, and the appropriate use of content. From “Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education” by Garrison, D. R., Anderson, T., & Archer, W., 1999, *The Internet and Higher Education*, 2(2-3), p. 88. Copyright: Creative Commons Attribution-ShareAlike 4.0 International License.

Garrison and colleagues later also developed a 34-item instrument, which was found to be “a valid, reliable, and efficient measure of the dimensions” of the CoI framework (Arbaugh et al., 2008, p. 133). This instrument measures student perceptions of IP applications (engagement strategies). Using this assessment tool, researchers have supported its validity for reporting student perceptions of IP (Caskurlu, 2018; Stenbom, 2018). This assessment was used as a guide for creating examples in the training modules detailed in the methods section of this paper.

Cognitive, Social, and Teaching Presence

As noted, research suggests numerous factors that affect retention and student success in the online learning modality, and similarly, the variables associated with CoI have been suggested to positively affect many of these factors. Hence, IP engagement strategies may support improvement in student success as well as a decrease the likelihood to drop out from school by more effectively encouraging the learner's participation and deeper engagement (Dixson, 2010; Hwangji, 2020; Martin & Bolliger, 2018). Yet, the research is not definitive about the direct relation of IP to retention and student success. One online editorial did note—based on interviewees, including professors and students—that feelings of connectedness to the instructor, course materials, and peers, could in turn, potentially affect dropout rates positively (Carr, 2000).

The CoI model emphasizes the need for instructors to be present in the online classroom by applying practices associated with the symbiotic elements of TP, SP, and CP (Garrison et al., 2010). However, in our review of the literature there was a lack of information regarding what exactly IP engagement strategies look like, specifically, especially with the present, ever changing technological options associated with the online learning environment. To develop successful examples, one must also understand each component of IP.

Teaching Presence

Teaching presence is defined as “the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (Anderson et al., 2001, p. 33). Teaching presence embodies how classes are facilitated, designed, and organized. Effective teaching presence provides students with ease of access to all parts of the online classroom (Garrison et al., 2000). It entails providing resources to improve student outcomes and timely feedback to improve learning and comprehension. Clearly communicated expectations, instructional clarity, easily accessible resources, and timely feedback are examples of teaching presence.

Cognitive Presence

Cognitive presence is the fostering of intellectual curiosity, critical thinking, and creativity, encouraging students to explore and participate (Garrison et al., 1999). These factors can be accomplished in many ways such as encouraging thought and reflection within online discussion boards (Christensen & Spackman, 2017; Hwanglu, 2018) or providing effective feedback on assignments, ensuring understanding by asking questions in the discussions, or by sharing relevant knowledge from the course text and professional experience in the discussion (Garrison et al., 2000). However, to encourage this level of engagement, students must trust the environment, which is stimulated by SP.

Social Presence

Social presence is critical to successful IP engagement strategy applications. It has been shown to reduce feelings of isolation, improve retention rates, improve academic performance, increase self-efficacy, and reduce feelings of isolation (Collins et al., 2019; Lederman, 2020). Social presence is much more than showing up for class. It is showing students the instructor is a real person behind the computer screen who is willing to be there to guide the student to success.

Identifying strategies that positively affect students' success and course completion rates is imperative, but complicated. Just looking at one variable provides limited perspectives.

However, by seeking out the factors suggested by research that affect areas of concern and merging the information that research does support may be a good place to start. Strengthening IP is one way to potentially improve student retention factors and success, and hence this study identifies the variables that IP strategies are suggested to improve, disseminates clear guidance (in the form of training modules) to instructors, measures the level of IP application improvement by these instructors, and lastly analyzes these practices.

Purpose of the Study and Research Questions

The purpose of this study was to identify whether key strategies founded on the principles of IP when applied effectively would improve retention factors and student success in online courses. The rationale for creating such training utilized a quasi-experimental, causal comparative design to determine the influence of instructors' participation in the IP training on TP, SP, and CP, as well as to determine if these applications would affect course pass rates and dropout rates.

Prior to the first training module launch, the research study was approved by an Institutional Review Board (IRB). The study followed OHRP guidelines (<http://www.hhs.gov/ohrp/>) for protection of human subjects. Results were only accessed by the investigation team. To preserve confidentiality, courses selected for examination, as well as the participating instructors, were randomly coded. Written consent was obtained prior to any examination of courses. A pre-launch self-assessment identifying pre-dispositions about IP was distributed to all instructors and included the opportunity to participate in the study. Only consenting instructors (both full and part-time) aligned to the online university participated in this study.

The research questions:

1. Will a significant improvement in instructor presence engagement strategies within the learning environment be significant pre-exposure versus post-exposure of completing the IP training modules?
2. Do course pass rates significantly improve in courses that are instructed by participants who completed the IP training modules?
3. Do course drop rates significantly improve in courses that are instructed by participants who completed the IP training modules?
4. Do instructors experience satisfaction with the IP training and applying the strategies within their courses?

Methods

Participants

The participants in this study were instructors at a fully online for-profit university and were aligned with the health and behavioral science programs. Initially, 81 of 217 instructors in the college agreed to participate in the formal research (as the training was also part of an institutional initiative offered to all faculty by the college). The final number of participants to

complete the modules was 47 of 81. Of the 34 instructors who did not complete the training, 14 had left the university. The remaining 20 instructors completed the training but after the deadline for the formal post-analysis research. Table 1 identifies participant demographics.

Table 1
Participant Demographics

Demographic	Descriptor	
Gender	Male: 13	Female: 34
Employment Status	Full-time: 8	Part-time: 39
Degree Level	Terminal degree: 35	Master’s Degree: 12
Program Alignment Level	Master’s: 16	Bachelor’s: 31
Instructor’s Department Affiliation	Behavioral Sciences: 25	Health Sciences: 22
Longevity (Years) with the Institution	2 years: 3	7 years: 19
	4 years: 3	8 years: 8
	5 years: 6	10 years: 4
	6 years: 4	
Experience (# of courses taught at the institution)	13-22: 4	60-69: 7
	30-36: 4	70-85: 5
	41-49: 7	90-125: 7
	51-57: 7	153-190: 3

The instructors’ courses that were later evaluated for IP engagement strategies totaled 188 (94 pre- and 94 post-training). Thirty-seven of the instructors taught undergraduate courses; the ten remaining taught master’s courses. See Table 2 for pre- post- course sizes.

Table 2
Rubric Evaluated Course Sizes Pre- Post-Training

Course Size Breakdowns: # of students	Pre-training Course: # Instructors	Post-training Course: # instructors
< 9	11	11
10-15	14	14
16-20	8	9
21-25	10	10
26-30	4	3

Participants were provided with a series of seven self-paced interactive training modules highlighting specific methods designed to enhance TP, SP, and CP in the online classroom. Strategies were designed based on research findings utilizing the CoI framework assessment tool (e.g., Damm, 2016), as well as our current teaching application practices and observations of courses for over a decade.

The Intervention

Development and Dissemination of the Modules

The goal of the development of the IP-based self-paced interactive training modules was to develop the participants’ knowledge about IP based on CoI. Strategies included sharing specific examples and interactive self-evaluation opportunities. Specifically, we designed examples that we determined would support the variables that are suggested to affect student success and retention.

The final product included seven training modules that specifically addressed the components of IP: TP, SP, and CP. The content was developed over the period of one year, using scholarly resources and the foundations of Garrison’s model and assessment tool (Arbaugh et al., 2008) to not only develop instructor knowledge about the framework, but to also offer concrete examples of how to apply the concepts within the online environment using interactive content and strategies. Examples used in the self-paced training were identified and collected from the virtual classrooms of faculty who exhibited high levels of each component with their permission and were also created by our team and media specialist. Table 3 lists a portion of the application examples for each area of IP that were included in the training modules.

Table 3
Instructor Presence Application Examples

Teaching Presence	Social Presence	Cognitive Presence
ANNOUNCEMENTS		
<ul style="list-style-type: none"> • Clear, thorough, and organized expectations, • Consistent and weekly engagement • Elaboration about weekly activities included 	<ul style="list-style-type: none"> • Warm and motivating tone • Contains video, audio, images, or quotes • Opportunity for students to “see” and get to know the instructor as more than just someone behind a computer 	<ul style="list-style-type: none"> • Encourages critical thought/expansion of knowledge • Learning style options provided
BIOS		
NA	<ul style="list-style-type: none"> • Includes pertinent information • Welcoming tone • Suggests a real person behind the screen 	<ul style="list-style-type: none"> • Includes professional interests/research/publications piquing interest and dialogue from students • Connects professional expertise to content
FEEDBACK		
<ul style="list-style-type: none"> • Rubrics provided and aligned to activities 	<ul style="list-style-type: none"> • Responds in a personal manner to all students’ introductions • Refers to the student by name. • Salutations • Demonstrates positive regard and emotions, such as respect, empathy, and enthusiasm. (Use of emoticons, humor, self-disclosure, etc.) 	<ul style="list-style-type: none"> • specific responses • relevant • additional examples or resources are shared • critical content insight shared • extend their thinking on the topic, • prompt for elaboration, • inquire about examples of their main points, • challenge their assumptions and defend their main points,

- Genuine interest in who the student is
- are contextualized/aligned with the student's original posting,
- requires students to consider, apply, evaluate, defend and/or explain information
- encourages dialogue

The modules were then developed and disseminated to health and behavioral sciences instructors who had consented to participate. The modules were organized as the following:

- Module One: Introduction to Instructor Presence
- Module Two: Cognitive Presence: Part One
- Module Three: Cognitive Presence: Part Two
- Module Four: Social Presence: Part One
- Module Five: Social Presence: Part Two
- Module Six: Teaching Presence
- Module Seven: It's a Wrap: Applying All Three Areas of Presence Together (Included a post-assessment)

The modules were launched as each module's development was completed. The subsequent launch and roll-out of modules occurred over a period of a year and six months.

Instruments and Measures

Instructor Presence Applications Rubric

To assess the level of IP applied to the classroom, two analytical rubrics were developed by the researchers: one for pre-module training and one for post-module training. As noted above, the rubrics were created using the CoI 34-item instrument (Arbaugh et al., 2008) as a guide. This tested rubric identified applications perceived by students as IP applications and were used to identify areas that should be assessed within the online classroom. In addition, the rubrics were calibrated by our team to establish inter-rater reliability (intraclass correlation coefficient [ICC = .9]). The "reliability value ranges between 0 and 1, with values closer to 1 representing stronger reliability" (Koo & Li, 2016, p. 155). Total courses assessed equaled 94 pre-training and 94 post-training.

It was necessary to create two rubrics since the learning management system (LMS) had also changed at the same time the IP modules were launched. Changes were minor and included the removal of assessment areas associated with the LMS that no longer were available or became available. For example, there was a "Meet Your Instructor" tab in the pre-training LMS that was no longer available in the new LMS. This area was removed in the post-training rubric. Also, an additional grading feedback area was included in the new LMS.

Each of the areas of presence reflected differing applications to assess: CP included 12 applications; SP included 31 applications, and TP included 20 applications (19 areas for the pre-training rubric due to plagiarism detection system not being able to be monitored by reviewers in the pre-training LMS.) (See Appendices C and D for more detail.) An analytical rubric was chosen since it specifically measures performance from differing lenses (Brookhart, 2013), and provides a more accurate profile of the strengths and weaknesses in one's performance

(Gronlund, 1998). Using the rubric, TP, SP, and CP were rated separately. Then, a final overall rating was averaged.

Extraneous Variables

Our research protocol also included extraneous variables (EVs) that could have potential effects on course drop and pass rates to further support, or refute, any findings of our principle analysis, as simply looking at IP applications could potentially create less credible findings since research has suggested that it is the interdependency of factors that affect retention and success (Sorensen & Donovan, 2017). We included demographic data, as well as department affiliation (behavioral or health sciences), student surveys, and performance ratings that were collected at the end of the module dissemination. Table 4 provides a definition for each EV.

Table 4
Extraneous Variables and Descriptions

Variable	Description
Longevity	The number of years that the instructor had been employed with the university. Groups were created: Years (2-6) and (7+)
Experience	This was based on the number of courses that the instructor had taught. Groups were created: 0-49, 50-99, 100+.
Program Alignment Level	Identified if the instructor was aligned to an undergraduate or graduate program.
Instructor’s Department Affiliation	Behavioral Sciences (n=25) and Health Sciences (n=22)
Degree Level	Instructor’s highest degree level: masters or terminal degree
Performance Ratings (IQR, FSDA, EOCS)	
A third of the scores were identified as the “High” category and the lower third of scores as the “Low” category	
Instructional Quality Review (IQR)	The IQR Scale is a Likert scale ranging from 0-4: “0” being “Not Observed”; 4 being “Distinguished”. The IQR is performed annually by fulltime faculty who lead the course associated with the instructor.
Faculty Support Development Associate Score (FSDA)	Reflects a more frequent monitoring of required participation in the classroom by instructors. The FSDA score was based on institutional engagement requirements and were weighted as follows: <ul style="list-style-type: none"> • Announcements: 10% • Response to Students: 10% • Instructive Feedback: 30% • Discussion Forums: 35% • Posting Grades: 15% The Likert scale ranged from 0 (not posted) to 4 (exceeds expectations).
End of Course Survey (EOCS)	This survey reflects student perceptions in each course and is cumulative. The scale is a Likert scale ranging from 0 (Strongly Disagree) to 4 (Strongly Agree). The scale included seven questions related specifically to the course perceptions, eight questions specifically related to the perceptions associated to the instructor, and one question about the student’s overall academic experience.

Instructor Satisfaction

As noted above, the satisfaction of the instructors was also important to include in our analysis since this can affect instructor behaviors in the classroom, including the potential for sustainably applying IP practices (Holzberger et al., 2013; Jamieson & Shaw, 2019; Toropova et al., 2020). The evaluation of satisfaction was a self-reported post-survey asking instructors to rate their satisfaction using a numerical scale (1=Not Satisfied; 10=Very Satisfied), a semi-dichotomous scale (Yes/No/Maybe), as well as an open-ended comment question:

1. Rate your current level of satisfaction regarding the Instructor Presence Development Series. (1=Not Satisfied; 10=Very Satisfied)
2. If you increased/improved your presence, do you believe it increased your teaching enjoyment based on the results? (Yes/No/Maybe)
3. Do you feel that the professional development series on instructor presence was worth the time needed to complete them? (Yes/No/Maybe)
4. Please share any additional comments you would like to provide related to the topic of instructor presence in online courses.

Course Pass and Drop Rates

Course pass and drop rates were assessed through the institution's data management system using Excel. Each course that was assessed for IP applications were also analyzed for these two factors by taking the original number of enrolled students in the course and dividing by the number of students who completed the course, as well as the final number of students who passed the course. For the undergraduate courses a D- was considered passing. For graduate courses, a C was considered a passing grade.

Data Collection

During data collection, confidentiality was of the utmost importance. First, the instructors were coded to deidentify and as the information was collected it was aligned to the coded individual. Specific collections included 1) demographic characteristics, 2) extraneous variables, 3) performance ratings, 4) IP pre- and post- strategy application scores, and 5) course drop rates and students pass rates (pre- versus post-). The demographic characteristics, EVs (gender, employment status, degree level, program alignment level, department affiliation, longevity with the institution, experience, and performance ratings), and drop and success rates were identified using the institutional data base. Pre- and post-training IP application strategies were scored based on the IP rubric created by our research team, as elaborated in the Instruments and Measures section. Satisfaction of the instructors was collected with a self-reported survey. Figures 4 and 5 note the questions and results.

To maintain the data, preparing it to be analyzed by SPSS, Excel was used, organizing the instructors' demographic characteristics, EVs, associated IP scores pre- and post-, other indicated performance measures, as well as the qualitative satisfaction data. Once all data was organized SPSS was used to analyze it.

Data Analysis

SPSS was used to analyze the quantitative data. To address satisfaction, comments were coded as being satisfied (y), not satisfied (n), or unknown (uk). An omnibus test using MANOVA was used to legitimate rejection of the null hypothesis in the design since the IP variables were highly correlated. T-tests were used post hoc to determine the precise location of the significant differences. Wilks' lambda was performed on the EVs: longevity, experience,

program alignment level, instructor's department affiliation, degree level, performance ratings, and student ratings (Table 4).

Results

Research Question One: Will a significant improvement in instructor presence applications within the learning environment be evident pre-exposure versus post exposure of the IP training modules?

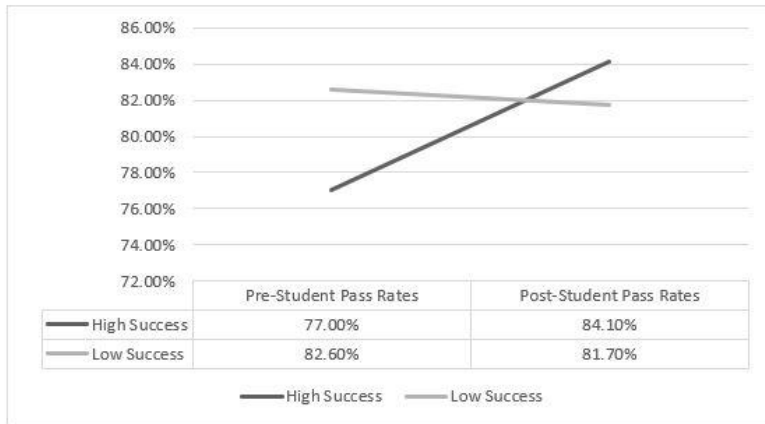
The paired samples two-tailed t test reflected significant improvement of IP strategy applications in all areas of IP pre-training versus post-training: social presence ($p = .000$), $t(46) = -5.20$; cognitive presence, ($p = .000$), $t(46) = -6.45$; and teaching presence ($p = .008$), $t(46) = -2.79$.

Research Question Two: Do course pass rates significantly improve in courses that are instructed by participants who completed the IP training modules?

Based on the paired samples two-tailed t test, significant improvement in course pass rates in courses that were taught by instructors who had been exposed to the IP training modules, ($M = -3.34$, $SD = 11.39$), $t(46) = 4.8$, $p = .05$) was evident. To account for EVs (longevity, experience, program alignment level, instructor's department affiliation, degree level, performance ratings, and student ratings) that could potentially affect the improvement in pass rates pre to post exposure, an analysis using the multivariate test, Wilks' lambda, was performed. All of the identified variables were not significant ($p < .01$): degree level ($F [1, 45] = .66$, $p = .42$, $r^2 = .01$); program alignment level ($F [1, 45] = .55$, $p = .65$, $r^2 = .01$); number of courses taught ($F [2, 44] = .12$, $p = .89$, $r^2 = .01$); instructor's department affiliation ($F [1, 45] = 4.45$, $p = .04$, $r^2 = .09$); performance scores ($F [4, 41] = .30$, $p = .87$, $r^2 = .03$), and experience ($F [1, 45] = .44$, $p = .51$, $r^2 = .01$); and longevity ($F [1, 45] = .48$, $p = .49$, $r^2 = .01$).

To further identify outside factors that could contribute to the student pass rates, the holistically analyzed variable of "performance scores" was broken down by three components: End of Course Student Survey (EOCSS), Faculty Activity Report (FAR), and the Instructional Quality Review (IQR, an annual performance assessment). For the mixed design ANOVA, simple categorical representations of each were created by grouping the upper third of scores as the "High" category and the lower third of scores as the "Low" category. Hence, a third of the data points in the middle were removed from the analysis. The original scores were condensed to the high and low ratings overall, so the decision to create the two categories was made. For EOCS, FSDA, and IQR High/Low, there were no main effects on success. With regard to interaction effects, the EOCS and FSDA also had none. However, there was a marginally significant interaction effect of IQR High/Low for success ($F [1, 33] = 4.29$, $p = .05$, $r^2 = .12$) and for drop out ($F [1, 33] = 4.36$, $p = .05$, $r^2 = .12$). The High IQR group (higher quality review scores) experienced a greater improvement pre-to-post in student success (Figure 2).

Figure 2
Estimated Marginal Means for Course Pass Rates

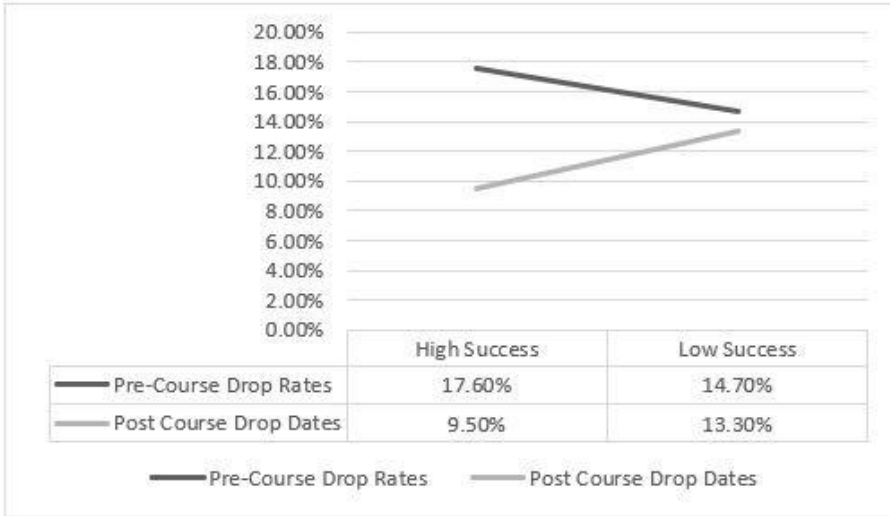


Research Question Three: Do course drop rates significantly improve in courses that are instructed by participants who completed the IP training modules?

Based on the paired samples two-tailed *t* test, course drop rates did improve significantly ($M = 5.45$, $SD = 9.34$), $t(46) = 4.00$, $p < .001$). Again, to rule out other variables affecting the success rates, an analysis using the multivariate test, Wilks' lambda, was performed on the EVs. All of the identified variables were not significant ($p < .01$): degree level - ($F [1,45] = .05$, $p = .83$, $r^2 = .001$); program alignment level - ($F [1, 45] = .13$, $p = .72$, $r^2 = .003$); number of courses taught - ($F [2, 44] = 1.53$, $p = .23$, $r^2 = .07$); department affiliation ($F [1, 45] = .71$, $p = .41$, $r^2 = .02$); performance scores ($F [4, 41] = .71$, $p = .95$, $r^2 = .02$); and longevity ($F [1, 45] = .48$, $p = .49$, $r^2 = .01$).

As applied to success, a mixed design ANOVA was also analyzed for EOCS, FSDA, and IQR scores individually. Similarly, there were no main effects on course drops. The EOCS and FSDA also had no interaction effects. There was a marginally significant interaction effect of IQR High/Low for success for drop out ($F [1,33] = 4.36$, $p = .05$, $r^2 = .12$). As was with success, the High IQR group (higher quality review scores) experienced a greater improvement pre-to-post in both the drop rates (Figure 3).

Figure 3
Estimated Marginal Means for Course Drops



Research Question Four: Do instructors experience satisfaction with the IP training and applying the strategies within their courses?

Figure 4 and Table 5 include the results of the satisfaction survey questions. Most of the instructors were satisfied with the new engagement strategies as applied in their courses.

Figure 4
Satisfaction of the Instructors with IP: Numerical Scale.

Very Not Satisfied	1	2	3	4	5	6	7	8	9	10	Very Satisfied
# of participants				1		1	4	8	6	20	
%				2.5%		2.5%	10%	20%	15%	50%	

Table 5
Satisfaction of the Instructors with IP: Semi-Dichotomous Scale.

If you increased/improved your presence, do you believe it increased your teaching enjoyment based on the results?		
Yes	Maybe	No
86.5% (32)	13.5% (5)	0
Do you feel that the professional development series on instructor presence was worth the time needed to complete them?		
Yes	Maybe	No
83% (39)	12% (5)	5% (2)

* Responders were also asked for a rationale. Overall instructors expressed feelings of increased efficacy, enjoyment, and improved student success in their courses. In addition, they felt the engagement strategies were a helpful addition to their strategy toolboxes. The specific qualitative results can be reviewed in Appendix A.

Please share any additional comments you would like to provide related to the topic of instructor presence in online courses. See Appendix B.

Interaction Effects of IQR for Course Pass Rates and Course Drop Rates

The analysis also offered additional information that is helpful to addressing online learning concerns. There was a marginally significant interaction effect of IQR High/Low for course pass rates ($p = .046$) and for course drops ($p = .045$), suggesting more effective applications by high performing instructors. Study findings also indicated that IP applications were significantly higher ($p < .01$) in faculty who completed the training modules, as compared to pre-training application assessments.

Discussion and Recommendations

Importance of Instructor Presence Applications Training

Based on our findings, this research suggests that instructors' exposure to, and application of IP practices in the classroom, positively and significantly affect course pass rates and drops, which in turn affect student success and retention. Our findings support current research in the field connected to online teaching best practices and student achievement (Oyarzun et al., 2018; Popescu & Badea, 2020; Tyrväinen et al., 2021). Providing development opportunities for online instructors to be more effective at engaging with their students may be an important part of addressing the concerns associated with student success and retention in the online learning setting. We suggest that training offer specific applications rather than simply IP concepts, as well as using strategic measures to encourage accountability.

Instructor Presence Training Effects on Student Success and Retention Variables

Course Pass Rates

Course pass rates are an important factor when addressing student success (Kauffman, 2010). As our results suggest, instructors who were trained in utilizing IP engagement strategy applications experienced improvement in passing rates by their students. This finding further supports current research associated with teaching practices and improving pass/success rates (Hughes et al., 2021)

Course Drop Rates

As noted, course drop rates in online courses are a significant concern associated with online learning courses, which in turn affect overall retention. Our results indicated improvement in course drop rates in online courses where the instructors were trained in applying the IP strategies. Previous research has also suggested that the methods employed by instructors matters to lower the likelihood for dropping out of courses and programs (Budiman, 2018)

Instructor Satisfaction and Instructor Presence Training

Although specifically targeted online learning studies are limited, organizational research (Reissová & Papay, 2021) has suggested that employees (instructors) who are less satisfied with their teaching experiences may be less likely to perform at optimal levels. This satisfaction is also considered cyclical: When the students are satisfied, instructors are satisfied (Moore, 2002, as cited by Bollinger et al., 2014). One element affecting satisfaction of instructors is an unbalanced workload, which was one concern about the post-effects of our training protocol. However, although applying IP strategies can take additional thought, planning, and purposeful

engagement, the majority of participants were pleased with the new procedures, expressing satisfaction with the practices as well as the increased engagement experienced by their students.

In addition, the EVs were not found to be significant predictors for either course pass rates or drop rates, further strengthening the results of this study. The marginally significant interaction effect of IQR High/Low may suggest that those with higher performance experienced increased benefit using the strategies, or potentially felt more efficacious to do so, supporting previous research that suggests that performance ratings can positively affect retention, persistence, and student success (Jacob et al., 2017; Pascarella et al., 2008).

Limitations

Although these findings offer pertinent information to the academic community about engaging online students to improve success and retention factors, the study is limited. First, data were not collected over subsequent remote terms or from other universities, which limit sustainability or more generalizable findings. Second, the length of time it took to disseminate the modules was over a year. Having the training offered sequentially and more quickly could affect the results, both positively and negatively. The small sample size also affects the generalizability of the findings.

Implications and Future Research

Our findings support the growing evidence that online teaching strategies not only differ from face-to-face instruction (Paul & Jefferson, 2019), but must also be tailored to fit the context of the learning environment and its learners (Kim et al., 2019). In addition, it suggests that developing instructors associated with applicable strategies is necessary, as these practices may be limited by instructor self-perceptions and their ability to successfully teach online (Sliwinski & Rosser-Majors, 2018). IP, based on CoI, offers specific areas of consideration that can be applied to the identification and application of successful online teaching strategies as demonstrated by our research findings. These emerging online teaching and online design strategies are important to acknowledge when tackling the impeding concerns associated with retention and student success in the online learning environment.

It is becoming more evident, based on the growing research discoveries aligned to IP (Oyarzun et al., 2018; Popescu & Badea, 2020; Rosser-Majors et al., 2021; Tyrväinen et al., 2021), that all three IP components (teaching, social, and cognitive presence) must be addressed in unison, rather than as separate strategies, to develop specific and replicable strategy applications to improve variables associated to retention and student success. Educational administrators and leaders must consider how these practices can best be delineated to their instructors and to their course designers to develop the foundational advantages of these practices based on their own student populations, course design and timelines, as well as instructor motivation.

We also recommend future research that addresses IP sustainability potential, diverse instructor needs and satisfaction and the effects of performance, as well as replicated studies using the IP rubric to establish it as a valid and reliable tool for evaluating IP practices within classrooms.

Conclusion

The educational landscape is always evolving, and various reasons exist why students of all ages seek online learning to complete college credits or an entire program of study. Acknowledging the challenges online institutions have experienced related to student success, retention, and graduation rates, and identifying sustainable online practices is essential. Effective instructional practices that evolve with technology must be applied to improve online learning outcomes and the results of our research are promising in the area of teaching methods associated with online education.

Data Availability Statement

Raw data for this study can be obtained by writing to Michelle.Majors@UAGC.edu

Declarations

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

The authors assert that approval was obtained from an ethics review board (IRB) at the University of Arizona Global Campus, USA.

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Appendix A

Instructor Rationale: Research Question #4

Question: If you increased/improved your presence, do you believe it increased your teaching enjoyment based on the results?

- YES**
83% (39)
- “I was a bit hesitant at first to try some of the social presence ideas to show emotion or disclose myself too much. Now I think it is a great way to connect and build trust. It engages me more too.”
- “...Just a short note on my experience with video responses and the impact on instructor surveys and retention. My survey percentages for the 1/22 course were the best I have ever. May be an anomaly, but according to student responses it was directly connected to video responses for all DQ's and announcements. I believe that retention was better too because of personal touch...Glad I did the training modules to find out this option existed.”
- “Thank you for offering such an incredible training. I think that we can all get a little bit stuck doing things just one way, and this has certainly opened by eyes to some to some amazing new strategies to apply in my classroom. I am so excited to get started!”
- “I found it a good learning experience to give me the scholarly background for why these interrelated concepts are important for student learning and retention. I find myself already using some of these techniques in my current class.”
- “It is encouraging seeing students succeed.”
- “Yes, I see more engagement, critical-thinking and reflection by my students with original and peer replies.”
- “Teachers should also be learning and receiving benefit from their own activities. Gratification regarding student learning is one area that is important for instructor morale.”
- “Since presence foster's student success, and I am driven by their successes, increased presence does lead to more exciting / enjoyable outcome.”
- “Hearing positive feedback from students as well as fulfilling a challenge to continue to grow as a teacher has been satisfying.”
- Improved self confidence that I will be making a difference
- “I am enjoying my teaching experience very much. I think that resources we are being provided by the department administration are excellent. The faculty engagement is extremely helpful in engaging with the students that need improvement in the class. I really am grateful for the opportunity...”
- “Yes, I think if I learned feedback with video or explaining grading both the students and I would accomplish more engagement.”
- “It is more fun to engage and ensure that students are learning and understanding, rather than merely grading.”
- “Teaching in an online setting is much more enjoyable when you can see student engagement increase due to the instructor being more present and finding ways to make the classroom more interactive and fun.”
- “I love this series and greatly appreciate the time and attention that was put into their development. I hope to see updates or refresher courses over the next few years.”
- “Overall, just excellent material that bridged theory with the provision of realistic tools.”
- “GREAT course”
- “Thank you for your commitment to teaching excellence in the classroom.”
- “Thank you so much! I found the modules to be very informative, engaging and helpful in continuing to assist me in effectively engaging my students!”

Improving Retention Factors and Student Success Online

Maybe
12% (5)

I enjoy being present as an instructor. It is fulfilling and makes the experience very rewarding. Seeing the difference it makes in students' lives makes it worthwhile; however, I am also feeling incredibly burnt out. There is not enough time to spend in the classroom and to be present, and I end up feeling like I am performing more poorly because I can see where I am failing - even when I know I am giving it everything I can.

Not sure yet.

Yes, my teaching enjoyment is based upon student success.

It seems as though work requirements are steadily increasing over the years while pay is not climbing at the same rate. It feels as though we are implementing some of these new strategies essentially on volunteer time, which decreases enjoyment in a teaching job since it is a job.

I am not sure. Again, I have just completed this series.

No
5% (2)

It is about the same.

Appendix B: Post Training Survey: Open-Ended Comments

Please share any additional comments you would like to provide related to the topic of instructor presence in online courses.

None, I can think of beyond shrinking the classroom sizes to give us the time to spend more time with the students.

It is extremely critical for instructors to catch students early before they fall through the net of giving up, develop a recovery plan for them and help them stay focused on their academic goals and achievements. When students know that their professors care, this can help them care about themselves.

A written transcript of ALL videos should be provided as an alternative method of completion of the series.

I love this series and greatly appreciate the time and attention that was put into their development. I hope to see updates or refresher courses over the next few years.

I hope that we can continue to support the use of classroom enhancement tools so that we can provide the best education for our students.

Overall, just excellent material that bridged theory with the provision of realistic tools.

liked the diverse layout and strategies used to teach presence; kept me interested!

GREAT course

It was wonderful course and more should be done.

No other comments at this time.

you did a great job

I loved this series and would love to be a part of it in the future

Be watchful of using "humor" in the classes. These students have very diverse personalities and may become offended. Always be respectful, flexible, empathetic, and available.

Thank you all so much for the series. I expect to learn more as I review the slides over and over.

Thank you for your commitment to teaching excellence in the classroom.

These were really well done as training modules! Thank you! Nice job :-)

Thank you! XXX offers high quality professional development and I appreciate it.

Thanks for all the wonderful resources.

Thank you so much! I found the modules to be very informative, engaging and helpful in continuing to assist me in effectively engaging my students!

the training was GREAT!