# DOES ONLINE INSTRUCTORS' TECHNOLOGY READINESS, AGE, OR ONLINE TEACHING EXPERIENCE PREDICT COURSE COMPLETION IN THE ASYNCHRONOUS ONLINE CLASSROOM?

John Steele, Grand Canyon University

## ABSTRACT

*The ability to integrate technology into the online asynchronous classroom is a crucial component of online instruction. The purpose of this correlational study was to determine if online instructors' technology readiness (TR), instructors' age, or the instructors' online teaching experience could predict their students' course completion rates in the asynchronous online environment. A correlational-predictive design was used with a final sample of 99 full-time online undergraduate instructors. The results indicated that the instructors' technology readiness, age, and online teaching experience did not predict the course completion of their students.*

**Keywords***: correlational study technology readiness, online teaching experience, course completion*

## INTRODUCTION

The Covid-19 pandemic impacted educational delivery worldwide (Boland et al., 2022; Mufidah et al., 2022; Muñoz et al., 2022). The pandemic caused a majority of higher education institutions to innovate and explore alternative educational delivery strategies, such as flipped classrooms, Microsoft Teams, Google Classroom, and Blackboard (Shirahmadi et al., 2023). The move to online education presented several new challenges for students and faculty alike, including a lack of connectivity, limited access to digital tools, and higher education institutions' lack of infrastructure. A study by Muñoz et al. (2022) noted that instructors did not understand how to use or access the learning platforms and technology tools. Instructors who may have the content knowledge but lack the ability to use and understand technology may have a harder time in the online learning environment. The lack of technology use or understanding could lead to lower student course completion.

*Course Completion*

As online enrollments continue to grow and expand more online, students must continue to have positive outcomes. Course completion rates are one way that universities can measure student outcomes. Course completion simply refers to a student's ability to pass a course (Evans, 2015). If a student does not pass a course, the student cannot have a successful outcome or be retained. The current study only included undergraduate students, thus a grade of "D" or above was considered passing. However, it is important to note that different universities may calculate course completion rates differently. Additionally, course completion does not denote retention. Other issues such as GPA or requiring a higher passing grade for core classes could further impact student retention. However, course completion and student retention are closely related since students who do not complete courses cannot be retained. Pinchbeck and Heaney (2022) note how student retention is the most important indicator for online learning. Building a supportive and engaging online community is critical to aid student retention (Ng, 2018; Pinchbeck & Heaney, 2022). Finally, several studies determined that the instructor could play a key role in supporting and engaging students in the online classroom with the

incorporation of technology (Ng, 2018; Robertson et al., 2019; Seery et al., 2021; Steele et al. 2017; Travers, 2016.

*Background COI*

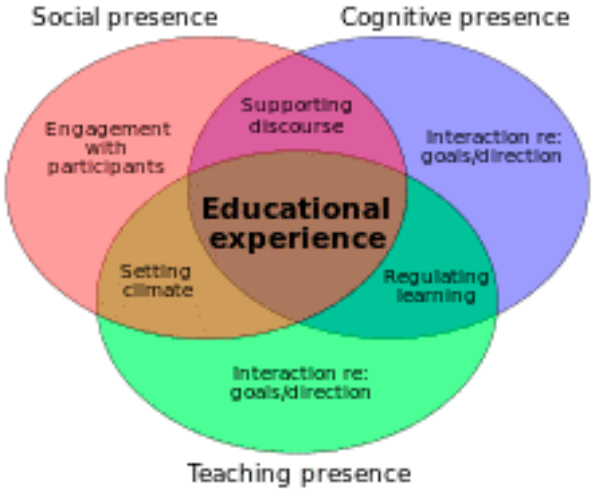
Garrison et al.'s (2000) community of inquiry model (CoI) is the foundation of the e-learning modality and primary learning theory in the online asynchronous environment. Several studies have noted how text-based communications dominate the landscape in the e-learning environment in the asynchronous environment (Epp et al., 2010; Garrison et al., 2000; Nagel et al., 2009). The physical isolation of an asynchronous online learning environment can make students feel disconnected from the instructors and the university (Phirangee, 2016). The rise of distance learning in the last decade has made this instructor-student connection paramount in online education. The vast advancements in technology have enabled instructors to connect easily to students with various technology options, making it easy, effective, and efficient.

*Technology Readiness Index*

With the vast advancement of technology, online instructors must be comfortable and confident when using technology, or this may project on the students. "Technology readiness" (TR) is defined as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasurman, 2000, p. 308). However, to teach online, instructors must be comfortable with technology. Since most learning occurs at a distance, online instructors must view technology favorably as a vital tool to help students learn. Additionally, if an online instructor has a more favorable view of technology, it is much more likely that the faculty member will incorporate it into the teaching pedagogy. If an instructor can effectively use technology, it can offer other opportunities to build CoI presence in the classroom.

Technology inclusion can also allow for the inclusion of instructor presence. Richardson et al. (2016) noted that instructor presence is the concept of the intersection of the CoI diagram (Figure 1.), where teaching and social presence overlap. Building instructor presence can allow the instructor to present themselves in a humanistic manner, making students feel connected while making the instructor more approachable. Several studies mention the overlap of these two presences as instructor presence (Collins et al., 2019; Lowenthal, 2016; Robertson et al., 2021). The use of Web 2.0 tools, such as Remind, podcasts, and video software, can be helpful tools for making connections with students and increasing an instructor's presence (Steele et al., 2017). Conklin and Dikkers (2021) found that creating instructor social presence and connectedness helped with the quick emergency shift that happened during the Covid-19 transition to a virtual environment. The Covid-19 pandemic demonstrated a need for online instructors to be able to use and connect with students using technology to help students be successful in class.

*Figure 1.*
*Visual of Instructor Presence in the CoI Model*




*Online Teaching Experience*

Online teaching experience can also play a crucial element in an online instructor's ability to incorporate technology into the online classroom. Hence, the more experience an instructor has in the online classroom, the more likely the instructor is technology savvy. An Andrade (2015) study found that online instructors with sound training can create a positive student experience and implement effective teaching practices. Ligita et al. (2022) noted the importance of being accustomed to delivering content online. According to Wingo et al. (2017), instructors became more satisfied with online teaching with more experience. Online instructors with previous online teaching experience even had a more positive perspective on teaching mathematics and using online

technologies (Adnan & Boz, 2015). Finally, online instructors with more experience teaching online were found to have more positive perspectives and better attitudes (Wingo et al., 2017).

*Facilitator vs. Lecturer*

The role the instructor has is different in the online classroom. Eom and Ashill (2016, p. 195) state that the primary role of the instructor in e-learning is to "guide on the side" and support learner-centered active learning instead of being the "sage on the stage." In the asynchronous online environment, instructors often take more of a role as facilitators versus lecturers as in a traditional learning environment. In a traditional environment, an instructor with content knowledge can lecture or do in-person activities. Consequently, in the asynchronous online environment, facilitation is more of a necessity. Facilitation allows the instructor to manifest each of the three CoI presences (Evans et al., 2020). A study by Ligita et al. (2022) found that familiarity with technology was crucial for online instructors to facilitate online teaching. Effective facilitation may require the instructor to be experienced in the online environment and/or well-versed in technology.

## METHODOLOGY

*Sample and Design*

A correlational-predictive design was used to determine if an online instructor's technology readiness index (TRI), online teaching experience, or age could predict their students' course completion. There was an additional research question that asked participants about the most valuable technology used. The data was collected using nonprobability purposeful sampling to extract the sample since only online instructors who teach undergraduate courses were included. Only undergraduate students were used for this study since the undergraduate population normally has lower course completion and retention rates. A G*Power analysis was conducted to determine the appropriate sample size linear multiple regression analysis, using $\alpha = 0.05$, a medium effect size (0.15), 95% power, and three predictors which amounted to a minimum number of 89 online instructors.

The participants consisted of full-time online instructors, administrators, and faculty specialists who taught undergraduate courses over the previous academic year. All eligible participants received a recruitment email to participate in the study via SurveyMonkey©27. A total of 107 surveys were completed. Through the screening and cleaning of data, incomplete surveys and outliers were removed reducing the final sample size to 99 participants.

*Research Questions and/or Hypotheses*

RQ1: Does the Technology Readiness of online instructors predict their undergraduate students' Course Completion Rate?

$H_0$: The Technology Readiness of online instructors does not predict students who complete a course.

$H_1$: The Technology Readiness of online instructors does predict students who complete a course.

RQ2: Does the online instructors' online teaching experience predict their undergraduate students' Course Completion Rate?

$H_0$: The online instructors' online teaching experience does not predict students who complete a course.

$H_1$: The online instructors' online teaching experience does predict students who complete a course.

RQ3: Does the online instructors' age predict their undergraduate students' Course Completion Rate?

$H_0$: The online instructors' age does not predict students who complete a course.

$H_1$: The online instructors' age does predict students who complete a course.

RQ4: What do online instructors find to be the most valuable technology to their instruction?

## DATA ANALYSIS

A correlational-predictive design was used to explore the hypotheses with the outcome variable of Course Completion Rates and predictor variables of online instructors' TRI, age, and years of online teaching experience. The TRI scores were the mean scores of the online instructors measured by TRI 2.0. The instructors' age and years of online teaching experience were gathered in the survey. The outcome variable of Course Completion Rates was retrieved

from archival data. The internal consistency reliability of an instrument is commonly measured using Cronbach's alpha (Rovai et al., 2014). Table 1 displays a comparison with the reliability alphas across several different studies using TRI 2.0. The reliability of the TRI 2.0 subscales had remained consistent as depicted in Table 1. One study by Badri et al. (2014) determined that the subscale for Innovativeness was below the acceptable level at 0.56. It was noted that when one statement was removed ("It seems your friends are learning more about the newest technologies than you."), the Cronbach alpha increased to an acceptable level of 0.764. There was a similar level of internal consistency for this study, except for the subscale item of discomfort at 0.56. The participants consisted of only full-time online instructors who may have a higher level of comfortability with technology.

*Table 1.*
*TRI Scale—Comparative Reliability Coefficients*

| | TRI Scale: Comparative Reliability Coefficients | | | |
|---|---|---|---|---|
| Scale | Original TRI (Parasuraman, 2000) | Badri et al. (2014) | TRI 2.0 (Parasuraman & Colby, 2015) | Current Study |
| Optimism | .78 | .81 | .80 | .75 |
| Innovativeness | .82 | .55 | .83 | .80 |
| Discomfort | .79 | .70 | .70 | .56 |
| Insecurity | .72 | .72 | .71 | .71 |

## DESCRIPTIVE FINDINGS

*Participant Characteristics*

All participants were recruited through an email message inviting them to participate in the study that was sent via the administration. All participants would then click on the embedded link which brought the participant SurveyMonkey©27 with the informed consent. Additionally, all participants who completed the Technology Readiness Index 2.0. also answered the demographic questionnaire. The TRI mean score was ($M$ = 3.49) as depicted in Table 2. Most participants had a widespread amount of online teaching experience ($M$ = 7.28; $SD$ = 2.96). Since full-time online instructors have recently emerged over the last decade the maximum amount of online teaching experience was 13 years, as depicted in Table 2. Most participants were also middle aged ($M$ = 44.80; $SD$ = 9.03).

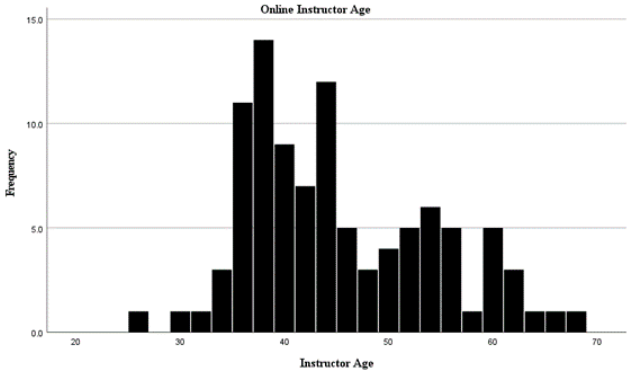
*Table 2.*
*Descriptive Statistics for Variables*

| Variables | Minimum | Maximum | Mean | *SD* |
|---|---|---|---|---|
| TRI Score | 2.00 | 4.75 | 3.49 | .54537 |
| Course Completion | 72.10 | 94.90 | 81.96 | 5.13788 |
| Instructor Age | 26 | 67 | 44.80 | 9.036 |
| Years Teaching Online | 1 | 13 | 7.28 | 2.962 |

*Note. N*= 99

As depicted in Figure 2, most participants were younger than 43 years of age, with a mean age of 44.80 ($SD$ = 9.03).

*Figure 2.*
*Online Instructor Age*




*Note. N* = 99

## RESULTS

The results are presented for each of the four research questions for this study. Also displayed are the alternative and null hypotheses. The results include the predictor and criterion variables. There was an additional research question addressing the participants' most valuable technology

RQ1: Does the Technology Readiness of online instructors predict their undergraduate student's Course Completion Rate?

$H_0$: The Technology Readiness of online instructors does not predict students who complete a course.

$H_1$: The Technology Readiness of online instructors does predict students who complete a course.

The participant's Technology Readiness scores accounted for less than one percent of the variance (R2 < .001) and did not predict Course Completion Rates F(1, 97) = 0.004, p = .947. Table 4 provides the predictive model. Therefore, the determination was made to fail to reject the null hypothesis.

*Table 3.*
*Summary of Simple Regression—Technology Readiness Predicting Course Completion*

| Variable | *B* | *SE* | 95% CI LL | 95% CI UL | *t* | *p* |
|---|---|---|---|---|---|---|
| Constant | 82.187 | 3.379 | 75.480 | 88.894 | 24.320 | .000 |
| Years Teaching Online | -0.064 | .957 | -1.962 | 1.835 | -0.067 | .947 |

*Note.* ($N$ = 99), $R^2$ = .000, $F$(1, 97) = 0.004, $p$ = .947

RQ2: Does the online instructors' online teaching experience predict their undergraduate students' Course Completion Rate?

$H_0$: The online instructors' online teaching experience does not predict students who complete a course.

$H_1$: The online instructors' online teaching experience does predict students who complete a course.

The instructors' Years of Teaching Experience Online did not predict their students' Course Completion Rates $F$(1, 97) = 2.785, $p$ = .098 with an R2= .028. Table 7 provides the predictive model. Therefore, the determination was made to fail to reject the null hypothesis.

*Table 4.*
*Summary of Simple Regression Analysis—Years of Teaching Experience Online Predicting Course Completion*

| Variable | *B* | *SE* | 95% CI LL | 95% CI UL | *t* | *p* |
|---|---|---|---|---|---|---|
| Constant | 79.917 | 1.329 | 77.279 | 82.554 | 60.132 | .000 |
| Years Teaching Online | .285 | .171 | -0.054 | .623 | 1.669 | .098 |

*Note.* ($N$ = 99), $R^2$ = .028, $F$(1, 97) = 2.785, $p$ = .098

RQ3: Does the online instructors' age predict their undergraduate students' Course Completion Rate?

H0: The online instructors' age does not predict students who complete a course.

H1: The online instructors' age does predict students who complete a course.

The Age of the online instructor did not predict their student's Course Completion Rates $F$(1, 97) = 0.029, $p$ = .866 with an $R^2$ <.001. Table 5 provides the predictive model. Therefore, the determination was made to fail to reject the null hypothesis.

*Table 5.*
*Summary of Simple Regression Analysis — Instructor Age Predicting Course Completion*

| Variable | *B* | *SE* | 95% CI LL | 95% CI UL | t | p |
|---|---|---|---|---|---|---|
| Constant | *81.526* | *2.637* | *76.291* | *86.761* | 30.911 | .000 |
| Years Teaching Online | *.010* | *.058* | *-0.105* | *.124* | .169 | .866 |

Note. (N = 99), R2 = .000, F(1, 97) = 0.029, p = .866

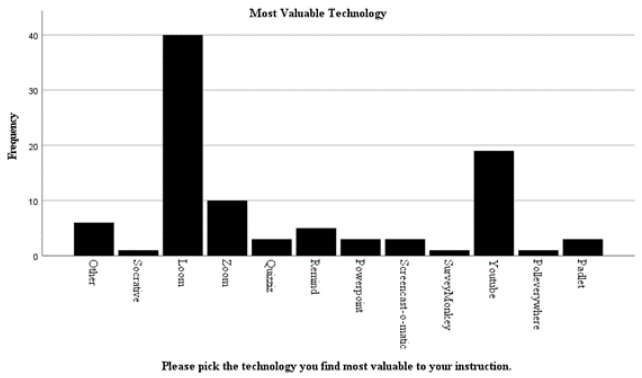
RQ4: What do online instructors find to be the most valuable technology to their instruction?

Additionally, participants indicated the most valuable technology incorporated into their online pedagogy outside of the LMS, which was Loom video with 40%, as depicted in Figure 3. The chart below details the participant's technology choices. Over 69% of the participants surveyed found video technology most valuable to their instruction. As depicted in Figure 3, participants selected the video technologies of Loom (40%), Zoom (10%),

and YouTube (19%). Thus, a majority of the instructors surveyed incorporated video technology as the most valuable component for instruction. The use of video technology demonstrates that most instructors were incorporating some sort of instructor presence into their classrooms. Thus, by building instructor presence, many online instructors presented themselves to their students in a humanistic manner, which could also have helped students feel more connected to the online instructors.

*Figure 3.*

*Most valuable technology. This figure illustrates the most valuable teaching technology that each instructor integrates into their classroom*




*Note.* $N = 99$

In conclusion, the online instructor's Technology Readiness, age, and online teaching experience did not predict the course completion rates of their students. A post hoc power analysis was completed to determine the effect size and statistical power for linear regression to limit the probability of Type II error. The TRI scores observed effect size was < .0005 trivial with an observed power of 0.056. The instructor's age was < 0.0005 also trivial with an observed power of 0.056. Thus, to determine if the online instructor's TRI or age could in actuality predict the course completion rates of their students, a sample size of 1,000 or more would be needed. However, the online instructor's online teaching experience had an observed effect size of 0.0288 (small) with an observed power of 0.387. Lastly, to determine if an online instructor's online teaching experience could predict the course completion of their students, a sample size of 275 participants would be needed.

## DISCUSSION

As technology moves forward, the TR of instructors will continue to be an essential piece of online learning. Continued advances in artificial intelligence (AI) could make basic technology skills become a necessity as an online instructor of the future. Consequently, the TR of the instructor, years of online teaching experience, and age were not able to predict course completion. The instructor's TR did not predict course completion but still could be an indispensable element of online learning. However, technology persists as a necessary learning component in remote working environments, and in online education, the TR of online instructors is a must.

Future studies could explore the relationship of TR and how may relate to other variables, such as student satisfaction, classroom engagement, or instructor efficiency. Likewise, other study options could explore how student learning may relate to other instructor factors, such as course content, personality, or experience. Other studies could incorporate more part-time online instructors who may not have as much time to become comfortable with technology. The lack of inexperienced online instructors could be demonstrated in the level of internal consistency from Cronbach's alpha for the subscale for discomfort (0.56). The low level for the subscale of discomfort could indicate that most participants were extremely comfortable with technology, thus leaving the sample lacking the group of instructors who were not comfortable with technology.

Although there was no significance noted with the regression analysis, the post hoc analysis revealed that the online instructor's online teaching experience could predict Course Completion rates with a larger sample. Based on the observed effect size, a sample of 275 online instructors would have been needed. A more robust sample would need to include more new instructors with little experience teaching online. The sample in the study was very experienced ($M = 7.28$; $SD = 2.96$) and lacked a group of inexperienced instructors as a sample of convenience. Additionally, through the use of video technology, most online instructors showed that they were incorporating some sort of instructor presence into their classrooms. By building instructor presence, the online instructors may have been presented in a more humanistic manner, making students feel more connected to the online instructors. Consequently, even though this study was not significant, it did highlight the importance

of having online instructors who are competent and confident with technology.

The methods of teaching and assisting student online can differ vastly from that of the traditional classroom. Online teaching can be more facilitation-based, making technology a vital component. Whether hiring new online faculty members or creating a curriculum, it is important to consider the TR of the online instructors. The instructors' online teaching experience and technology experience should be important factors for consideration when hiring new online instructors and developing training for online instructors. Online instructors need to be able to use various technologies to teach, communicate, and engage students in the online classroom. Technology and TR will only become a more important element in the online education realm as AI use increases.

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