A Comparison of Student Success, Attrition, and Perceptions of Course Satisfaction in Online Courses with Face-to-Face Health Information Management Associate Degree Programs

Susan L. Foster
Lindenwood University

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by

Susan L. Foster

November 2018
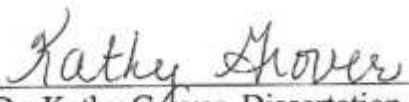
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School of Education

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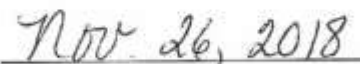
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This Dissertation has been approved as partial fulfillment

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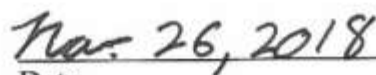
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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

Full Legal Name: Susan L. Foster

Signature: _Susan L. Foster_ Date: 11/26/2018

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Abstract

The purpose of this study is centered on health information management (HIM) student learning outcomes and attrition in an online learning environment as compared with that of a traditional face-to-face learning environment. Online education has become mainstream and enrollment continues to grow even though overall enrollment in higher education has decreased (Poulin & Straut, 2016). In addition, colleges and universities retain fewer online students than traditional face-to-face students (Brown, 2017). Furthermore, student satisfaction has been labeled as a measure of quality for online education (Online Learning Consortium, 2017). The Community of Inquiry theory of student satisfaction with an online learning environment was utilized as the theoretical framework for this study (Garrison, Anderson, & Archer, 2000). Quantitative data were collected from accredited two-year associate health information management program directors for analysis in this study. Students currently enrolled in health information management online courses were surveyed with a Community of Inquiry survey instrument to assess their perceptions of satisfaction with online courses. Descriptive analysis methods were utilized to answer the four research questions which guided this study. The findings of the study on differences between the national Registered Health Information Technician final exam scores and domain scores from graduates of traditional face-to-face courses with similar peers enrolled in online courses demonstrated a significant difference with lower overall scores for online graduates. On the other hand, there was no statistically significant difference between attrition rates of traditional face-to-face and online programs. Based on the analysis of the Community of Inquiry data, students of current online HIM courses have an above average degree of satisfaction.

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Chapter One: Introduction

Online learning is no longer a trend in American higher education, but rather has become mainstream by providing ease of access and affordability while becoming a more acceptable form of education and learning (Neumann & Neumann, 2016). Even though higher education is facing a decline in overall enrollment, online education has increased (Poulin & Straut, 2016). Allen, Seaman, Poulin, and Straut (2016) reported 5.8 million students were enrolled in online courses in 2014 (p. 4). As online enrollment continues to grow, educational institutions are confronted with the task of providing the same quality of education as face-to-face courses through online courses (Allen & Seaman, 2015). Although academic leaders of higher learning continue to sponsor and believe in the value of online learning, it is faculty who remain skeptical and doubt the true value and legitimacy of online learning (Allen et al., 2016).

With shrinking federal and state funding for higher education, performance-based funding has emerged to make colleges more responsible and accountable in hope strategies will be adopted to improve student persistence in college (Hillman, 2016). Performance-based funding has been tied to student retention and completion rates, which have become a growing concern among academic leaders (Juszkiewicz, 2016). Researchers of online retention rates have indicated many colleges and universities retain fewer online students than traditional face-to-face students (Brown, 2017; James, Swan, & Daston, 2016; Phirangee, 2016; van Hunnik, 2015). To reduce attrition rates in online education, it is important for educators to achieve a better insight into why students fail to persist to completion in online courses (Markle, 2015).

Background of the Study

Higher education in the realm of health information management has progressed over the last 75 years (Dixon-Lee & Tesch, 2012). Beginning in 1935, the first model curriculum with standards and procedures to follow for official program approval was established for medical record librarian schools with program accreditation beginning in 1942 (Commission on Accreditation for Health Informatics and Information Management Education [CAHIIM], 2016). This health information management curriculum has provided the knowledge base necessary for students to undertake the national Registered Health Information Technician exam, which was established in 1972 (American Health Information Management Association [AHIMA], 1998).

The Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM) (2016) took the lead in the development of competencies, which are used as the foundation of the curriculum for educational programs in the health information management discipline. The Health Information Technician assessment competencies were developed by credential-specific subject-matter experts, health information or informatics management leaders, industry leaders, and educators (AHIMA, 2016). Competencies are grouped into domains which represent areas of content to be taught, learned, and assessed (AHIMA, 2016). The CAHIIM is also responsible for establishing, implementing, and enforcing the standards and procedures for certification and recertification as well as assuring certification exams accurately assess the competency of health information management professionals (CAHIIM, 2016). To be eligible to take the national Registered Health Information

Technician certification exam, a student must successfully complete an accredited two-year associate degree program (AHIMA, 2016).

Since 2008, there has been a 29% increase in the number of Commission on Certification for Health Informatics and Information Management-accredited two-year associate health information management education programs (CAHIIM, 2016, p. 1). The expansion in health information management education programs has led to a 39% increase in enrollment (CAHIIM, 2016, p. 3). At the end of 2016, 87,767 credentialed members of the American Health Information Management Association existed (AHIMA, 2017a, p. 1). In addition, 37% of the members held the Registered Health Information Technician credential (AHIMA, 2017a, p. 1).

There continues to be growth in the demand for health information technicians (U.S. Department of Labor, Bureau of Labor Statistics, 2017). Job demand has increased due to an aging population who require increased medical care (Gorman, 2015). The upsurge in care and use of electronic health records has caused the proliferation of increased health information data (Sandefer, Marc, Mancilla, & Hamada, 2015). The number of positions is predicted to increase 13% from 2016 to 2026, thus requiring an increase in education and certification of health information technicians (U.S. Department of Labor, Bureau of Labor Statistics, 2017, tab 6).

Upon review of the National Postsecondary Student Aid Study, nearly 60% of the current undergraduate population is made up of nontraditional adult learners, including students with children, commuters, and students over the age of 25, with the majority attending part-time (Soares, Gagliardi, & Nellum, 2017, p. 11). In 2012, the American Association of Community Colleges [AACC] reported an average student age of 28 with

60% of total enrollment over the age of 22 (AACC, 2012, p. 8). The 2015 fall enrollment statistics reflected 63% of community college students work full-time while attending college (AACC, 2017, p. 1). The 2018 Fast Facts from the AACC showed the average student age at 28, however, there has been a drop in total enrollment over the age of 22 to 49%, which reflects the 1.7% drop in overall enrollment (AACC, 2018, p. 1). These community college enrollment numbers represent a growing population of nontraditional students who need flexibility in the place and time courses are offered (Ginder, Kelly-Reid, & Mann, 2015). The need for students to maintain multiple roles, including being a student, has increased demand for online coursework (AACC, 2012). The statistics for students who attend health information management associate programs have mirrored this demand (CAHIIM, 2016). There has been a 39% increase with one-third of all CAHIIM-accredited associate programs offered online and over two-thirds of the students enrolled in online programs (C. Dixon-Lee, personal communication, July 28, 2016).

Because of the increased demand for online health information management education, acquiring an accurate understanding of how students perceive their academic experiences will provide better insight into online education for both students and health information management educators. There has been limited scholarly research on the academic success and satisfaction of students with online health information management degree programs, which makes this research study unique and important to conduct (D. Mancilla, personal communication, September 19, 2017). Providing the research results to health information management educators may contribute to the enrichment and understanding of online health information management education.

Theoretical Framework

The role of community colleges has changed since being challenged to increase the number of U.S. citizens with postsecondary education degrees through improved student access and increased completion rates by 50% (AACC, 2012, p. 26). To further complicate the task of increasing student success and completion rates, the overall enrollment in higher education has decreased (Allen et al., 2016). However, online enrollments continue to grow with an 11% increase in online course enrollment by students from fall 2016 to fall 2017 (Ginder et al., 2018, p. 4). Since distance education has continued to grow as a sustainable form of learning, the faculty must make certain they are keeping abreast of the latest methods to enrich student educational experiences (Britt, 2015).

In this study, the online educational experiences of health information management students were explored using the Community of Inquiry framework (Garrison, Anderson, & Archer, 2000). The Community of Inquiry framework is modeled by the interaction of three essential core components which include social presence, cognitive presence, and teaching presence (Akyol & Garrison, 2008). Possessing social, cognitive, and teaching presence is considered necessary to establish an environment where learning is shared (Arbaugh, 2007). Educators should give specific attention to how these factors can be preserved when higher education is provided in an online environment (Garrison et al., 2000).

One of the three essential primary factors in the Community of Inquiry framework is social presence, which Garrison et al. (2000) described as the capability of students to portray themselves as genuine people both socially and emotionally using the medium of

communication provided. A strong social presence has been shown to provide important support in sustaining cognitive presence in a society of critical thinking inquiry (Garrison et al., 2000). The social presence element reflects concepts of Vygotsky's social-constructivism theory (Whiteside, 2015). When students socially connect with peers and instructors through personal experiences as they relate to class content, a sense of community is developed, which provides social and emotional support in the learning process (Tinto, 2012). Social constructivism has also been used in support of student success and persistence to complete a degree (Bawa, 2016; Sorensen & Donovan, 2017; Wu, Chen Hsieh, & Yang, 2017).

In the research of Tinto (2012), social presence is seen as the most important element of student success through involvement, often referred to as engagement. Engaging adult learners in an online classroom can be accomplished using authentic activities that involve real-world tasks and provide opportunities for learners to interrelate with each other as well as the instructor (Britt, 2015). In his theory on andragogy and adult learners, Malcolm Knowles concluded that actively engaging students with teachers, peers and course instruction promotes deep learning and is a motivating factor (Shi, 2017). Furthermore, research links social engagement of students in the classroom to persistence in completion of coursework (Ali & Smith, 2015; Richardson et al., 2015; Tinto, 2012).

When Garrison and his colleagues developed the Community of Inquiry theoretical framework, the initial focus was placed on cognitive presence (Garrison, Anderson, & Archer, 2001). Constructed from Dewey's practical inquiry and critical thinking models, the Community of Inquiry framework postulates a constructivist method

of scholarship in higher academia (Arbaugh, 2007). Cognitive presence reflects a fundamental feature to achievement in an educational experience and was explained by Garrison et al. (2000) as "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication" (p. 89).

In the theory of cognitive learning, the teacher facilitates the communication of information (Majeski, Stover, & Valais, 2018). Students take the information given by the instructor, or interact with information provided in class, and construct their own concepts and understanding through individual abilities to reason and interpret (Williams, Jaramillo, & Pesko, 2015). Teachers then add more complex issues to classroom instruction using their own learning experiences as a guide (Martin & Bolliger, 2018).

Teaching presence, the third crucial element, completes the Community of Inquiry framework and is characterized by the scheme and composition of the course, enablement of discussion, and explicit instruction from the teacher (Akyol & Garrison, 2008). Online courses must be well-organized and logical in presentation with relevant assignments and meaningful activities (Martin & Bolliger, 2018). Teacher facilitation and direct instruction acknowledge the student's participation and are followed by constructive criticism with guidance of thoughts as well as moderation of online discussions between students and faculty (Garrison et al., 2000).

The main component of an online course for teacher-student interaction is the use of the discussion forum, which can enhance student involvement and participation more than face-to-face discussions, possibly due to the opportunity to reflect and analyze thoughts prior to responding (Vincent, Pilotti, & Hardy, 2016). Tinto (1997) described

the role of the teacher as one who shapes the learning and nature of the classroom community through the manner and degree with which the teaching presence is felt both inside and outside the classroom. The teaching presence online is felt through facilitation and guidance or moderation of the learning process (Garrison et al., 2000).

Statement of the Problem

With more online opportunities and an increased demand for online courses due to convenience, health information management educators are challenged to provide quality online courses in the health information management discipline; however, what is unknown is whether the success rate is equal to face-to-face courses (CAHIIM, 2016). Questions arise concerning the quality of learning in an online or distance format when likened to the outcomes of traditional face-to-face courses (Hixon, Barczyk, Ralston-Berg, & Buckenmeyer, 2016). Even though there have been numerous studies regarding student retention and success in completing online courses, information regarding student achievement with online and traditional face-to-face courses in the health information management discipline are dearth and represent a void in educational literature (D. Mancilla, personal communication, September 19, 2017). This study is designed to balance the disparity in literature covering this important research topic.

While health information management learners may be enticed to enroll in online courses because of the flexibility, accessibility, and suitability for managing work and family obligations, obstacles can occur causing students to become dissatisfied with the online educational experience (Franklin, 2017). The Online Learning Consortium, formerly known as the Sloan Consortium, is a non-profit organization committed to assisting educators and higher education institutions enhance the quality of online

learning; the consortium has labeled student satisfaction of online courses as a measure of quality (Online Learning Consortium, 2017). To measure online program quality, the identification of factors that influence student satisfaction and retention in online education is required (Bawa, 2016).

To address the problem of student retention and completion of online health information management programs, the factors that contribute to this problem must be identified (Travers, 2016). Some of these factors are linked to student attributes, academic preparedness, understanding and use of technology, and support from faculty and educational institutions (Bawa, 2016). Researchers of online student retention applying the Community of Inquiry framework have discovered retention to be lower than that of traditional face-to-face programs (Majeski, et al., 2018). When there is a strong community of inquiry with an increase of student participation in the online environment, students have a perception of increased learning, higher satisfaction, and significant persistence to remain (Arbaugh, 2008; Dolan, Kain, Reilly, & Bansal, 2017; Garrison & Arbaugh, 2007; Garrison & Cleveland-Innes, 2005; Page & Kulick, 2016; Pool, Reitsma, & van den Berg, 2017; Sorensen & Donovan, 2017).

Further research, by means of the Community of Inquiry framework, may add to health information management educators' knowledge-base on whether social, cognitive, and teaching presences are perceived by health information management students, and if the presences impact learner fulfilment in online courses. The understanding gained using the Community of Inquiry framework can be valuable in directing the development and evaluation of online health information management education. In addition, increased satisfaction of health information management students with online courses and

programs may encourage retention, resulting in additional health information

management graduates in the workforce to fulfill the healthcare necessities of society.

Purpose of the Study

A focus on student learning advancements in an online learning environment, as

compared with that of a traditional face-to-face learning environment were presented in

this study. The study objective was to determine whether student pass rate scores on the

Registered Health Information Technician national certification exam and seven domain

scores of distance education students were comparable to those of students in campus-

based traditional classroom programs. Data included in this study were collected from

the directors and faculty of 256 accredited health information management associate

degree programs. The perceived overall satisfaction of students with current online

course offerings in health information management associate programs was also

explored.

Learner attrition rates in online programs compared with those of traditional face-

to-face programs was examined in this study. The persistence of students to complete

courses and programs as well as attrition rates are often used to measure student

outcomes (Cavanaugh & Jacquemin, 2015). Researchers indicated retention rates are

comparatively lower for online courses when equated to traditional in-person courses

with drop rates in online programs found to be six to seven times greater than in face-to-

face courses (Gering, Sheppard, Adams, Renes, & Morotti, 2018; Glazier, 2016; Travers,

2016). As online programs continue to grow, attrition of online students adds to the

concerns for higher education as well as health information management education

(Bawa, 2016).

Given the growth in popularity of distance education, it was vital to investigate the effectiveness of such a delivery method and whether students benefit from this type of instruction (Jaggars & Xu, 2016). There has been limited research to measure the academic consequence of online instruction on the learning outcomes of health information management students (D. Mancilla, personal communication, September 19, 2017). The conclusions of the study contributed to the general body of research on learning outcomes of the online student and may be helpful to other faculty members in the evaluation of student learning outcomes in online courses.

Research questions and hypotheses. The following research questions and hypotheses piloted the study:

1. What difference exists, if any, between the national Registered Health Information Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses?

    H1$_0$: There is no difference between the national Registered Health Information Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses.

    H1$_\alpha$: There is a difference between the national Registered Health Information =- Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses.

2.   What difference exists, if any, between the national Registered Health

Information Technician domain scores from graduates of traditional face-to-face

health information management courses and similar peers enrolled in online

health information management courses?

H2₀: There is no difference between the national Registered Health Information

Technician domain scores from graduates of traditional face-to-face health

information management courses and similar peers enrolled in online health

information management courses.

H2ₐ: There is a difference between the national Registered Health Information

Technician domain scores from graduates of traditional face-to-face health

information management courses and similar peers enrolled in online health

information management courses.

3.   What difference exists, if any, between health information management

attrition rates among graduates of traditional face-to-face and online health

information management programs at two-year colleges?

H3₀: There is no difference between health information management attrition

rates among graduates of traditional face-to-face and online health information

management programs at two-year colleges.

H3ₐ: There is a difference between health information management attrition rates

among graduates of traditional face-to-face and online health information

management programs at two-year colleges.

4.   What are perceptions, as related to course satisfaction, among students of an

online health information management course in a two-year associate's program?

Definition of Key Terms

For the purposes of this study, the following terms are defined:

Attrition. Attrition refers to students leaving a course of study or degree plan without completion and is normally measured from one academic year to the next academic year (Betts, Shirley, & Kennedy, 2017).

Classroom program. A program in which required credits may be offered as a mix of traditional face-to-face, web-enhanced, or hybrid courses; yet all courses require students to attend class on campus or in some form of face-to-face learning environment (J Sener, 2015).

Cognitive presence. Cognitive presence is the degree to which learners through continuous exchange of ideas are able to form a greater meaning and understanding (Garrison et al., 2000).

Community of inquiry. Community of Inquiry characterizes the online learning framework that assumes understanding transpires within a community of learners due to the overlap and intermingling of three essential basic principles: cognitive presence, social presence, and teaching presence (Garrison et al., 2000).

Competencies. Health information management competencies are used to measure knowledge, skills, and abilities which exemplify the level of complexity, extent, and proficiencies necessary for job performance (AHIMA, 2016).

Distance education. Distance education denotes courses or a degree program operated completely online and excludes self-directed correspondence courses (Kena et al., 2016).

Domains. Health information management domains represent specific and similar areas of content composed of individual competencies (AHIMA, 2016).

Face-to-face course. A face-to-face course refers to a traditional classroom course that is based on a specific number of hours for in person class activities which are required, and content is delivered with lectures, workshops, laboratories, field trips or internships (J Sener, 2015).

Online course. An online course is classified as a course with all activity carried out online with no face-to-face meetings required, and no on-campus activities (Fuster, 2016).

Online program. A program where all credits required for completion are offered as fully online courses with no required face-to-face meetings (J Sener, 2015).

Retention rate. Retention rate is the percentage of first-time undergraduates who return to the institution and continue their studies the following fall semester (Kena et al., 2016).

Social presence. Social presence implies learners in a Community of Inquiry have the ability to project their individual qualities into the community, in so doing portraying themselves as actual people to the other learners (Garrison et al., 2000).

Teaching presence. Teaching presence represents the responsibility of the teacher for the course structure and facilitation of discussion and interaction between learners with direct instruction leading to successful educational outcomes (Garrison et al., 2000).

Limitations and Assumptions

Limitations of this study included a small population of test-takers participating in the national Registered Health Information Technician certification examination after completing a two-year associate degree from a Commission on Accreditation of Health Informatics and Information Management-accredited program. Therefore, the findings of this study are unable to be generalized to a larger population. Because the data were collected from the health information management program directors on a voluntary basis, the data were limited to that population. In addition, a Community of Inquiry survey was administered to the students enrolled in online health information management courses who voluntarily agreed to participate in the research project, thus resulting in limited data collection. It is assumed all questions answered were done so honestly and without hesitation.

Summary

The demand for the delivery of online education continues to intensify, with more students enrolling in online courses every semester, even though the overall enrollment in higher education has decreased in the recent past (Allen et al., 2016). There continues to be growth in the demand for health information workers due to an aging population, sparking an upsurge in the need for education and certification of health information technicians (U.S. Department of Labor, Bureau of Labor Statistics, 2017). Because of the increased need to educate healthcare workers, health information management educators are challenged to provide higher quality online and traditional campus-based courses.

This study was guided by four research questions and three null hypotheses. Key terms were defined and referenced throughout Chapter One. Limitations and pertinent

assumptions were made that influenced generalizability of the results to other populations.

A review of literature relevant to this research is presented in the following chapter beginning with the components of the Community of Inquiry framework as a method of assessing online learning. The history of distance education in U.S. colleges, the expansion of online learning, and the changes of the paradigm in learning due to online course delivery are addressed. The importance of retention of online students and student satisfaction with online coursework, as well as predictive characteristics of successful online students, are examined. A narrative of the Community of Inquiry model and template tool, as well as the factors which influence student persistence and completion of online courses, are addressed in Chapter Two.

Chapter Two: Review of Literature

A shift in college student demographics from the usual 18-year-old toward older students who are working and raising families supports the belief demand for online education will continue to grow (Fox, 2017). Educational institutions are challenged to provide quality education as online education enrollment continues to grow (Allen & Seaman, 2015). Globally, the United States has been the most engaged in research and development of benchmarks for quality evaluation and policy covering online education (Martin, Polly, Jokiaho, & May, 2017).

The Online Learning Consortium (2017) labeled student satisfaction with online courses as a measure of quality. In addition, the lack of student retention and completion of online education is a problem that has been identified and must be addressed (Travers, 2016). As opportunities for online education in the health information management discipline increase, educators are challenged to provide quality online programs; however, there is lack of research as to the impact of online education on student success when testing at the national credentialing level (CAHIIM, 2016).

Background literature related to online education quality, coupled with student success and satisfactory student experiences, are examined in Chapter Two to provide support associated to the research questions of this study. In the first section, the foundations and development of the Community of Inquiry theoretical framework, as related to online coursework delivery and measurement of student satisfaction, are reviewed. The shift in paradigm of course delivery, attitudes, perceptions, and the resulting pedagogical practice of online education is discussed in the second section. In

conclusion, adult learning, retention and completion, as well as problems encountered with adult online learning are explored.

Theoretical Framework

America's community colleges have pledged to generate 50% more students holding a postsecondary education degree by focusing on the goal of improving access to education and improving college completion rates (AACC, 2012, p. 26). The drop in the overall enrollment numbers of higher education further delays completion of the task to increase student success and persistence to completion (Allen et al., 2016). However, there continues to be a growth in enrollment of distance education students with 5.8 million enrolled in fall 2014, and the largest portion of distance education students are enrolled at public institutions (Poulin & Straut, 2016, p. 20). Due to the continued growth of distance education as a supported form of learning, keeping informed of the most recent methods is imperative for faculty to ensure students have an exceptional educational experience (Britt, 2015).

Utilizing the Community of Inquiry framework, the online educational experience of health information management students was examined (Garrison et al., 2000). Three fundamental overlapping factors of cognitive presence, social presence, and teaching presence make up the Community of Inquiry framework (Akyol & Garrison, 2008). To create a shared learning environment, it is vital teaching, cognitive, and social presences are part of the process (Arbaugh, 2007). Particular attention should be given to how the cognitive, social, and teaching elements of a shared learning environment are maintained during an online format in higher education (Garrison et al., 2000). The Community of Inquiry framework model (see Figure 1) shows the overlap of the three elements of

social, teaching, and cognitive presences, which are assumed necessary for a good

learning experience in an online educational environment (Whiteside, 2015).

Community of Inquiry

Social Presence

Cognitive Presence

Supporting Discourse

Educational Experience

Setting Climate

Selecting Content

Teaching Presence

Communication Medium
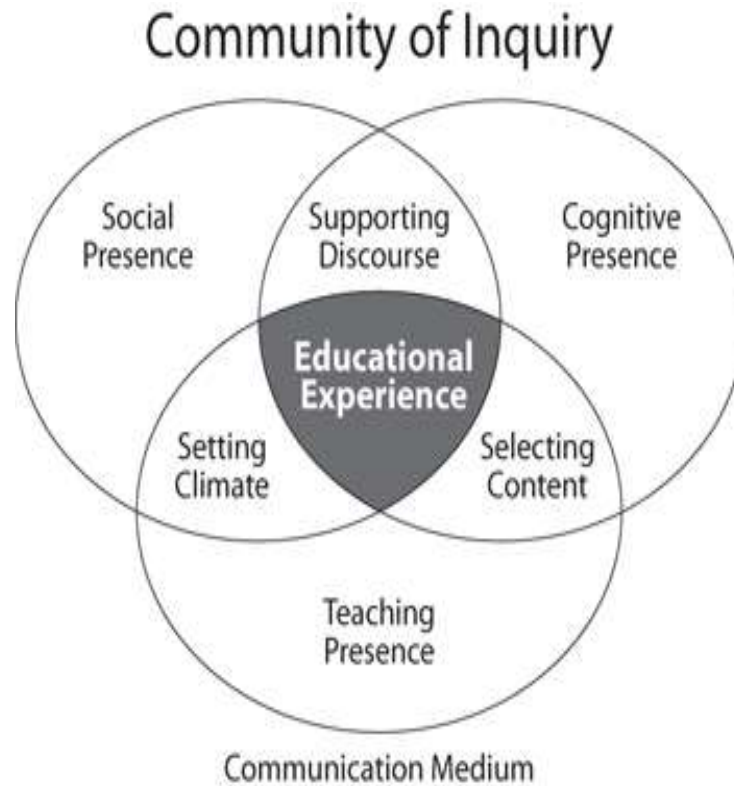
Figure 1: Community of Inquiry Model. Adapted from "An Interactive CoI

Framework," by D. R. Garrison, T. Anderson, and W. Archer, 2016a, *The Community of*

Inquiry [website]. Retrieved from https://coi.athabascau.ca/coi-model/an-interactive-coi-

model/ Reprinted with permission (see Appendix A).

Social presence. Garrison et al. (2000) described social presence, which is an

essential component in the Community of Inquiry framework, as the ability of students to

cast themselves as genuine people emotionally and collectively using the mode of

communication offered. In a community of critical thinking inquiry, a deep-seated social

existence has been shown to support and sustain the vital cognitive presence (Garrison et al., 2000). Vygotsky's social-constructivism theory echoes the social presence element concept (Whiteside, 2015). Having a social presence in the classroom is frequently described as engagement and is the most significant component of student success through commitment as shown in the research of Tinto (2012). Relationships built on socially connecting teachers with college personnel and colleagues promote social and emotional reinforcement in the educational and learning experiences of students (Tinto, 2012). In addition, students who engage socially in the classroom are more persistent with successful completion of assignments and courses (Ali & Smith, 2015; Richardson et al., 2015; Tinto, 2012).

Research studies of student success in higher education with a better chance of degree completion were supported by the social constructivism theory (Bawa, 2016; Travers, 2016; Wu et al., 2017). Student experiences with fellow students and the instructor create a perception of community, which is the foundation of the social constructivism theory (Tinto, 1997). When instructors use assignments that involve real-world activities in an online course, adult learners can interact with one another as well as the instructor and become fully engaged (Britt, 2015). Actively engaging students with teachers, peers, and course instruction promotes deep learning and is a motivating factor as postulated by Knowles' in his theory on andragogy and adult learners (Shi, 2017). By relating personal experiences to course activities, students develop an association with one another and the instructor, which promotes an impression of community within the online environment (Tinto, 1997).

Instructors can achieve social presence in the online classroom by actively participating in the online course, through announcements, group discussions, responding to emails promptly, and providing feedback on assignments in a personalized and timely manner (Hajibayova, 2017). Use of focused dialogue and the exchange of ideas through discussions and collaboration keeps learners engaged and reduces feelings of isolation by creating a sense of virtual community (Franklin, 2017). Lack of instructor interaction, illustrated by not being fully engaged with students in discussion forums or failing to provide meaningful feedback on assignments, leads to feelings of isolation (Sorensen & Donovan, 2017). Social presence supports cognitive presence and enhances students' critical thinking making social presence the primary framework component for the successfulness of an educational experience (Hajibayova, 2017).

Cognitive presence. As the development of the Community of Inquiry theoretical framework began to progress, Garrison and his collaborators placed the initial emphasis on the core component of cognitive presence (Garrison et al., 2000). The Community of Inquiry framework was harmonious with constructivist methodologies of learning in higher education, which was drawn from Dewey's critical thinking and practical inquiry paradigms (Arbaugh, 2007). In his practical inquiry model, Dewey defined a cognitive presence as: a problem is presented which needs to be solved; ideas are explored to solve the problem; assimilation of idea solutions occurs; and the best solution or combination of solutions is chosen and employed to resolve the presented problem (Kozan, 2016). Garrison et al. (2000) defined cognitive presence as "the extent to which the participants in any particular configuration of a community of inquiry are

able to construct meaning through sustained communication" (p. 89) reflecting cognitive

presence as the most basic component to a successful experience in higher education.

 Ideally, the teacher conveys information during a course of active collaborations

and responses with students when utilizing the theory of cognitive presence (Majeski et

al., 2018). Students form their own beliefs and insight through their individual abilities

to rationalize and understand using the information provided by the teacher, or by relating

with material provided in class (Williams et al., 2015). By using their own learning

experiences as models, teachers develop and include more intricate and compound

problems to classroom lessons (Martin & Bolliger, 2018). Use of deep learning and

discussions at high cognitive levels are displayed through student reflections and

evaluation of ideas and with problem resolution which is guided by question strategies,

prompts, and explicit instructor expectations (Williams et al., 2015).

 Cognitive engagement encompasses critical thinking by demonstrating a deep

discipline understanding and the ability to justify decisions and ideas (Redmond,

Heffernan, Abawi, Brown, & Henderson, 2018). Increasing a cognitive manifestation in

an online course results in the increase of student social presence, while increasing social

presence includes the encouragement of social relationships between participants with an

intermingling of a cognitive presence during social interaction (Kozan, 2016). In the

online environment, student engagement is significant in the development of cognitive

knowledge and leads to a higher level of student success (Martin & Bolliger, 2018).

 Teaching presence. The final and third necessary factor in the Community of

Inquiry framework is teaching presence, which is portrayed by the construction and

composition of the course, how the lessons are communicated and the leading of

discussions, all of which are performed by the teacher (Akyol & Garrison, 2008). When constructing an online course, it is essential to have consistency in the organization and presentation of information with pertinent and significant learning activities (Martin & Bolliger, 2018). Teachers moderate discussions between students and provide constructive feedback, questions, and comments that guide the critical thinking process, which further encourages students to participate (Garrison et al., 2000). Students of online courses prefer to be individually assessed and view robust communication skills of the instructor as essential attributes for motivating completion of the learning process and achievement of the student learning outcomes (Hajibayora, 2017).

The principal source of contact between an instructor and learners of an online course, other than electronic mail, is the use of discussion activities, which have been found to increase student involvement to a greater degree than do face-to-face discussions, conceivably due to having more time to contemplate responses prior to answering questions (Vincent et al., 2016). However, increased student satisfaction and success have been found in online courses with large discussion groups and less faculty interaction (Selhorst, Klein, & Harrison, 2017). Tinto (1997) suggested that teachers influence learning by the method and measure in which a presence is felt both within and outside the classroom, creating a community of scholarship. Through facilitating, guiding, or moderating the learning activities, the teaching presence is felt in online lessons (Garrison et al., 2000). A stronger teaching presence is highly correlated to an increase in social presence, and vice versa, and both required cognitive presence (Kozan, 2016).

The teaching presence has two primary functions: design of the course (collection, configuration and appearance of course content, activities, and assessment) and facilitation of the course with regular communication providing support of social and cognitive presences (Hajibayova, 2017). Online instructors should be good organizers, because it is important to give students a well-organized course at the beginning of the class, including all the materials and links to websites and other resources needed (Sun & Chen, 2016). The only means of online instructor engagement is through the course design and interaction, which has had an impact and has made building a rapport with students a factor that instructors can control and use to improve student retention (Glazier, 2016). However, instructors have no control over learner characteristics and students' abilities to control the learning process through self-direction (Huang, Chandra, DePaolo, & Simmons, 2016). Students projected that communication with the instructor was the single most important aspect of online learning, making strong communication skills an important attribute of instructors lending to student motivation and the overall success of the learning experience and outcomes (Hajibayova, 2017).

A Shift in Paradigm

Distance education first began well over 100 years ago with the use of correspondence through written text as a form of two-way communication between instructor and student (Garrison & Cleveland-Innes, 2010). Interest in distance education grew dramatically as it became available to women and others, who without the use of correspondence might have never attained an education (Osam, Bergman, & Cumberland, 2017). Until recent years, learning has been mainly confined to brick-and-mortar classrooms, but as interest and demand for distance education continued to grow,

there has been a rapid change in the educational paradigm (Mouasher & Lodge, 2016).

In fall 2016, the U.S. Department of Education reported that approximately one-third (p. 163) of undergraduate students were enrolled in some online courses with 13% (p. 163) enrolled exclusively in online courses (McFarland et al., 2018).

Exclusively taking face-to-face classes for campus-based students has become less common with more students taking at least one, if not more, online course as part of their class schedule (Gering et al., 2018). Online courses are no longer seen as a supplement to traditional brick and mortar programs but rather as a replacement for institutions and programs (Sanga, 2017). Women are taking more online courses and graduating faster than men, and men who take some online courses are more likely to graduate faster than men who do not (Shea & Bidjarano, 2016). Online courses may exceed traditional classes in quality and rigor through student-centered learning, enriched readings and learning activities supporting critical thinking, and highly interactive teacher-learner and learner-learner discussions along with prompt grading and feedback (Glenn, 2016; Sanga, 2017).

A student's choice. With the advancement and use of technology in the search of knowledge, traditional brick-and-mortar universities no longer dictate how knowledge is created and disseminated (Sanga, 2017). Because of the ability to access information without the constraints of time and location, new opportunities for a diverse population of students to obtain an otherwise unobtainable education have been achieved (Gering et al., 2018). However, the amount of time involved in collaboration with others, required synchronous attendance, and overall amount of time necessary to do well as indicated by

previous students, dictates the decision whether to enroll in an online course (Marshall, Greenburg, & Machun, 2012).

According to Clinefelter and Aslanian (2016), 55% (p. 22) of online college students already know the program of study they want, and more than 75% (p. 24) acknowledge career advancement as their motivation for enrollment. As the non-traditional student population expands, the attraction of online courses increases for students balancing work, family, and coursework obligations (Flynn, 2016). The flexibility and convenience of online education are foremost in the minds of college students as they make the choice to enroll in online courses (Sorensen & Donovan, 2017; Redmond et al., 2018). The most important reason identified for college selection is based on whether or not the program is available which best meets the needs and interests of the student (Magda & Aslanian, 2018).

However, even though online courses provide convenience and flexibility, some students choose to take a face-to-face course as opposed to an identical online delivery course because they feel they can learn more, they can earn a better grade, and a face-to-face course would require less effort than an online delivery course (Dobbs, Waid-Lindberg, & del Carmen, 2017). Students have identified proficiency in the use of a learning management system, self-motivation, time management, and self-discipline as skills necessary to be successful in an online course (Crews, Wilkinson, & Neill, 2015). Students' perceptions of the relevance of an online course and how it contributes to their personal and financial success were found to be indicators of student motivation to complete the course (Gering et al., 2018). Course design, institutional support through

orientation, continued communication, and advising were also found to impact online student success (Glazier, 2016).

Course design and pedagogy are two important aspects that should be considered when seeking maximum engagement of the online student (Redmond et al., 2018). Increased student satisfaction, motivation to learn, sense of learning community, and student performance are linked to student engagement in online courses (Martin & Bolliger, 2018). Course-related activities, which predict a high level of student engagement, are meaningful and relevant to students as are course content and assignments, which are challenging, communication which utilizes a variety of technologies, and sharing knowledge and prior experiences within the online course (Bigatel & Edel-Malizia, 2018a).

Attitudes in practice. As higher education experiences a continued growth in online course offerings, faculty has reservations about the quality of online courses compared to traditional face-to-face courses (Grossman & Johnson, 2015). Faculty continue to question the importance and validity of online learning after more than a decade of significant growth in online courses and student enrollment (Allen et al., 2016). Some educators have seen the emerging technologies as a way to maintain interaction and collaboration with the possibility of creating sustainable communities of learners; other educators fear the use of computers will remove the human element from education altogether (Bunk, Li, Smidt, Bidetti, & Malize, 2015; Garrison & Cleveland-Innes, 2010). For online education to be accepted and supported, faculty must be involved in the change process of implementing and developing online programs and courses to ensure

academic freedom and reduce the fears of loss, failure and disruption of relational affiliations (Mitchell, Parlamis, & Clairborne, 2015).

For faculty to accept and adopt innovation in online courses, availability of software programs, technical support, professional development, and release time should be considered (Rucker, Edwards, & Fras, 2015). Because of the increased time and effort required by faculty to teach online courses, the workload between online instructors and traditional face-to-face instructors differs and failure to recognize this leads to feelings of discriminating treatment and possible discord among faculty (Mandernach & Holbeck, 2016). Educational attention differs greatly between traditional face-to-face courses where student questions can be addressed and answered in class and that of the online course where a discussion forum is typically the only form of two-way communication other than emails, phone calls, office visits, and video conferencing all of which increase the burden and workload of instructors of large-sized online courses (Bettinger, Doss, Loeb, Rogers, & Taylor, 2017). The increased amount of contact time required for an online course calculates to one online student being equal to four students in a traditional face-to-face course (Mandernach & Holbeck, 2016). The satisfaction and support of faculty is critical for online education to be successful (Martin et al., 2017).

The higher demands of instructing an online course versus that of a traditional face-to-face course is one reason online teaching has met the resistance of faculty (Bunk et al., 2015). The average instructional time requirement to teach a full workload of four online courses in a semester calculates to 51 hours per week (Mandernach & Holbeck, 2016, p. 5). A large number of students enrolled in an online course equates to an increased workload for the instructor (Bettinger et al., 2017). When online discussions

are required in an online course, students as well as instructors spend a considerable amount of time participating in the discussion which increases the workload (Cho & Tobias, 2016). Larger sized online courses increase the probability of student withdrawal from the course, which may reflect student perceptions of less attention from instructors in online discussions or greater competition for personal attention via email (Bettinger et al., 2017).

A measure of quality. Administrators of higher education institutions have pressured faculty to offer courses online but lack requirements in regard to quality of instruction and achievement of student learning outcomes in online courses (Bunk et al., 2015). Faculty members and technology administrators agree the use of educational technology provides some improvement in student outcomes, yet only 17% have concluded online courses can achieve similar learning outcomes as face-to-face courses achieve (Straumsheim, Jaschik, & Lederman, 2015, p. 5). As the world of online education persists and grows, the reputation for quality course content and accuracy, overall instructional design, and the type of learning management system utilized will impact student choices of online programs (Martin et al., 2017). However, higher education continues to lack a standardized *method to evaluate and assess* the quality of online education (Rucker et al., 2015).

There are a plethora of standards, criteria, guidelines, and benchmarks for online learning in higher education, which have been developed by a multitude of accrediting bodies, institutions, trade associations, and consortiums for the common purpose of ensuring quality of online education (Southard & Mooney, 2015). Yet, there continues to be a lack of common guidelines for the assessment of quality of the online educational

environment (Martin et al., 2017). As competition grows in the online higher education market, concerns related to student outcomes and perceived student satisfaction with the quality of online education raise questions about how to assess and assure the quality of online education offered by educational institutions (Kozan, 2016). Retention rate, student success with academic outcomes, and faculty support are measures of quality in online education (Martin et al., 2017).

A common theme for assuring quality in online education is the encouragement of student-faculty interaction and providing prompt feedback to students (Watson, Castano, & Ferdinand-James, 2017). A compilation of sets of standards that were designed to provide guidance on quality assurance of online education revealed six common categories, which include: "(1) online curriculum policies and infrastructure, (2) faculty support, (3) student support, (4) course design, (5) course delivery, and (6) assessment and evaluation" (Southard & Mooney, 2015, p. 56). However, higher education has not provided any requirements concerning design-specific or delivery standards for quality assurance of online higher education courses (Rucker et al., 2015). The Quality Matters (QM) organization offers a rubric containing eight standards which can be used to enhance and standardize online course design and the quality of online courses (Gaston & Lynch, 2019). In the QM Rubric (2018), the first column includes these general standards: "(1) course overview and introduction, (2) learning objectives (competencies), (3) assessments and measurement, (4) instructional materials, (5) learning activities and learner interaction, (6) course technology (7) learner support and (8) accessibility and usability" (p. 1).

To facilitate quality in online education, faculty should be introduced to best practices and institutional policies, be prepared to teach in an online environment utilizing a learning management system and technology and be instructed in the design and development of courses prior to teaching online (Sanga, 2017). However, online courses were designed and instructed by faculty who most likely never received any formal educational instruction on how to design and deliver online courses which led to inconsistent standards (Gaston & Lynch, 2019). There has been little to no professional development provided to instructors of online courses when compared to professional development provided to the instructor of the traditional classroom (Zweig & Stafford, 2016). Huang et al. (2016) recommended that objectives, activities, and assessments of online courses should be clearly defined and utilize various teaching strategies, evaluation methods, and dialogue tools. Overcoming obstacles in online education and increasing student achievement requires preparation, organization, and clarity (Franklin, 2017).

Adult Learning

Dewey emphasized education and learners' prior experiences were interconnected, and the role of the educator was to steer interaction between the learner and the environment (Williams, 2017). In Knowles' theory of andragogy, it is similarly posited that adults need to learn through experience, and personal experiences of adults can be used as a valuable learning resource by educators (Knowles, 1984). Even though both Dewey and Knowles considered student experiences essential to the learning process, Knowles did not view the educator as someone who controlled and led the educational process, but rather viewed the educator as someone who guided or

encouraged the educational process (Giannoukos, Besas, Galiropoulos, & Hioctour, 2015; Williams, 2017). This ideology fits well with adult learners who are goal-oriented and self-directed by nature, keeping in mind that it is important for adult learners to see and understand the purpose of exercises and activities to be successful (Bigatel & Edel-Malizia, 2018a). Furthermore, for instructors to facilitate adult learning, awareness of motivating factors and enhancement of andragogical skills through professional development are highly recommended (Sogunro, 2015).

To enrich the online learning experience, instructors are challenged with incorporating multiple adult learning intelligences into instructional practice to stimulate the interest of a diverse population of online adult learners (Wilson, 2018). Independent learners who are self-regulated and self-motivated are more likely to succeed in the online course environment than those who lack these characteristics (Glazier, 2016). The nontraditional older student typically outperforms younger student peers in the online learning environment (Arias, Swinton, & Anderson, 2018).

Adaptive pedagogy. Enrollment in degree-granting institutions from 2004 to 2014 increased by 16% for those aged 25 and over and was projected to increase by 18% between 2014 and 2025 (Snyder, de Brey, & Dillow, 2016, p. 438). This increase of nontraditional adult students necessitates instructors to adapt teaching strategies and instructional methods to make learning relevant to adult students (Loizzo, Ertmer, & Watson, 2017). By moving away from traditional teaching techniques and utilizing a student-centered approach, such as problem-based learning, adult students learn through experience and develop deep cognitive and critical thinking skills (Brown, 2017). However, online education does not have a pedagogy specific to online learning but

instead, technology propels the learning, and online education is classified by the technology used rather than an online pedagogy (Serdyukov, 2015).

A successful online learning environment is one that is designed to elicit feelings of presence in which learners feel they are participating in a true teaching-learning experience with interaction between instructors and peer students (Hewson, 2018). Online courses may offer the advantage of flexibility and a sense of freedom; however, online courses demand more discipline by instructors and students alike (Arias et al., 2018). Effectiveness of online education is demonstrated through a well-designed course, and participation between the teacher and students creates a sense of community guided by well-prepared and completely supported faculty (Sun & Chen, 2016). Continuous engagement of students and assessment of performance are two of the most challenging tasks of online teaching (Sanga, 2017). Universal standards and methods for the evaluation of the online teaching-learning experience are needed to ensure online education is valued as an effective pedagogical experience (Singh & Hurley, 2017).

Learning in the online classroom. There is a wide range of characteristics of online learners, ranging from students who grew up with the Internet and cannot imagine life without digital media to adult pre-digital learners who may or may not be at ease with the digital era (Vai & Sosulski, 2016). In this digital age, information is readily available and is constantly in change mode as new information is added, giving rise to a generation of information scanners rather than readers (Mohr & Mohr, 2017). Consequently, the invasion of technology into higher education has challenged educators and institutions to make changes in the existing educational system and has led to questions about the future roles of learners, instructors, and administrators (Mitchell et al., 2015). In addition, few

instructors have received training and professional development for teaching of online course, and this type of training is not required by the higher education departments in any state, leaving the responsibility of preparing teachers to teach online courses to individual institutions (Zweig & Stafford, 2016).

Online education has expanded the diversity of the student population by age, educational experiences, and cultural behaviors, which lends to a variety of learning preferences and styles (Yeboah & Smith, 2016). The ability of instructors to assess and adapt pedagogical methods to their students' learning styles leads to better learning (Khan & Iqbal, 2016). To understand how different students learn, instructors should focus on a theory of learning to be consulted when developing learning and teaching activities to support the learning process (Ozdemir, 2016). The instructional design of the online course should be paired with the cognitive style of the student learner (Ozdemir, 2016). Instructors and adult learners alike must share accountability for an active and engaged online course experience with clear and ongoing communication, understanding and incorporating adult learning styles with quantifiable outcomes that maximize the potential for successful academic accomplishment (Huang et al., 2016).

Retention or failure to complete online. With an upsurge in the number of online students, there has been much discussion as to why students drop out or persist to complete online courses (Phirangee, 2016). The most prevalent reason adult students fail to complete higher education is lack of motivation and the inability to overcome the barriers of adult education (Luke & Justice, 2016). To further clarify, nontraditional adult learners feel left out or marginalized because of their age and the encumbrances of work, family, and finances that prevent them from full engagement in the academic

environment (Markle, 2015). Online courses which lacked quality and poor course

support provided by faculty as well as inadequate guidance from advisors were reasons

given by students who discontinued their studies (Sorensen & Donovan, 2017). Student

retention was positively impacted by active participation in online courses, which

provided motivation to the student to continue and complete (Torkzadeh, Zolfagharian, &

De La Rosa, 2016).

Determining why students drop out aided in the identification of students at risk

of withdrawing and provided an opportunity to intervene with additional support in

helping students overcome and complete rather than drop out (Sorensen & Donovan,

2017). Understanding the student determinants of success at each academic level enables

instructors to provide more personalized and applicable support in their online courses

(Gering et al., 2018). An instructor's inability to build a rapport with students causes a

disconnect, which results in poor participation, poor academic success, and withdrawal

from the online course (Glazier, 2016). Lack of support from instructors, staff, and

advisors, as well as lack of motivation and financial assistance, were found to be common

themes among students who dropped from online courses and programs (Sorensen &

Donovan, 2017).

Problems encountered with online learning. Success and motivation to persist

can be challenging to a student who lacks comfort and competencies with using

technology and who does not have a good understanding of what constitutes valid and

reliable information found on the Internet (Wilson, 2018). Students who have support

from family and friends, academic locus of control, scholarly self-value, and time and

organizational skills were more likely to persist in online courses (Gering et al., 2018).

Learners may have experienced anxiety with using computers; a perception of disparity in assessment, especially in a group assignment; and a personally sensed inability or obstacle when interacting with peers in online courses (Gillett-Swan, 2017).

A positive learning experience involves interaction and collaboration with other learners along with a high degree of ease when utilizing computers and technology in online courses (Khan & Iqbal, 2016). Student behavior that demonstrates a high level of engagement in an online class includes participation and interactions with the instructor and peers which expands beyond course obligations (Bigatel & Edel-Malizia, 2018b). Ultimately, student engagement and participation in online courses is controlled by the student alone, regardless of what support and instructions are in place or what type of assignments are given (Huang et al., 2016).

The interaction between instructor and student as well as student to student relationships are changed by the very nature of the online delivery method (Arias et al., 2018). Learning is a social and a cognitive process, and the demonstration of positive emotions in a classroom environment is stimulating and enhancing to the learning process (Hewson, 2018). In distance learning, a noticeable gap in communication is found, which has the potential to disrupt effective learning (Huang et al., 2016). Continuous engagement of students and assessment of performance are two of the most challenging tasks of online teaching (Sanga, 2017).

Summary

In this chapter, literature pertinent to the development of a perspective and background for this research study was reviewed. A theoretical framework, chosen to gain a better understanding of how to measure student satisfaction with online education,

was examined and described. The influence of the Internet and technology on learning, causing a change in the concept of education, as well as how online learning has become accepted as mainstream, were addressed. A discussion of the effects of online learning as it relates to student learning, student retention, student persistence to complete a degree program, and barriers to online learning was documented.

In Chapter Three, the purpose of the study and methodology used to examine the research questions guiding the study are presented. The population and sample chosen to conduct this study are outlined in detail. The survey instruments and processes utilized for gathering data are presented.

Chapter Three: Methodology

While focus on the quality of online education continues to grow, there still is a lack of research on student outcomes and online learning in the health information management field (Allen & Seaman, 2015). In addition to concern for quality, several researchers have supported the theory that courses which demonstrate social, cognitive, and teaching presences promote a successful online learning environment (Garrison et al., 2000; Garrison & Arbaugh, 2007; Garrison & Cleveland-Innes, 2005; Majeski, et al., 2018). Lastly, there continues to be concern over retention of online students and the struggle to identify potential students at-risk for leaving their courses and programs of study (Brown, 2017).

In this chapter, an overview of the research problem, the purpose of the study, and the methodology used to answer the research questions guiding this study are presented. Descriptions of the population and the sample chosen to conduct this study are also included. Survey instruments used in the study are described in detail, followed by a description of the process for data gathering and preparation. In the data analysis portion of this chapter, the specific statistical tests to be performed are discussed. Finally, the chapter concludes with ethical assurances and a summary.

Problem and Purpose Overview

A challenge to educators is providing quality online courses in the health information management discipline (Dixon-Lee & Tesch, 2012). However, questions arise concerning the quality of learning in an online or distant format when compared to the student outcomes of traditional face-to-face courses (Gaston & Lynch, 2019). Even though there have been numerous studies presented regarding student retention and

success in completing online courses, information regarding student success with online and traditional face-to-face courses in the health information management field are absent without representation in current educational literature (Brown, 2017; James et al., 2016; Phirangee, 2016; van Hunnik, 2015).

The purpose of this study was to determine if differences existed in student success on the national Registered Health Information Technician certification exam by comparing scores of students having traditional face-to-face instruction to scores of students receiving online instruction. In addition, student attrition rates in health information management programs, whether traditional face-to-face or online programs, at two-year institutions of higher learning in the United States were examined. Furthermore, the perceived overall student satisfaction with health information management courses presented in online format was analyzed.

Over the past three years, the pass rate for first time test-takers of the Registered Health Information Technician exam has dropped from 76% in 2013 (AHIMA, 2016, p. 2) to 68% in 2016 (AHIMA, 2017a, p. 1). At the same time, accredited programs have grown 29% increasing from 190 in 2008 to 267 in 2016 (CAHIIM, 2016, p. 1). Of the accredited programs, 104 are completely online, which represents nearly one-third of all associate programs and over two-thirds of all students enrolled in online programs (C. Dixon-Lee, personal communication, July 28, 2016). Currently, there is no known research specific to health information management education as it applies to traditional face-to-face courses versus the online format (D. Mancilla, personal communication, September 19, 2017). The intent of this project was to determine if course delivery

influenced the success rate of health information management graduates when testing on the national Registered Health Information Technician exam.

Research questions and hypotheses. The following questions guided this study:

1. What difference exists, if any, between the national Registered Health Information Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses?

H1_0: There is no difference between the national Registered Health Information Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses.

H1_α: There is a difference between the national Registered Health Information Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses.

2. What difference exists, if any, between the national Registered Health Information Technician domain scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses?

H2_0: There is no difference between the national Registered Health Information Technician domain scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses.

H2$_\alpha$: There is a difference between the national Registered Health Information

Technician domain scores from graduates of traditional face-to-face health

information management courses and similar peers enrolled in online health

information management courses.

3.   What difference exists, if any, between health information management

attrition rates among graduates of traditional face-to-face and online health

information management programs at two-year colleges?

H3$_0$: There is no difference between health information management attrition

rates among graduates of traditional face-to-face and online health information

management programs at two-year colleges.

H3$_\alpha$: There is a difference between health information management attrition rates

among graduates of traditional face-to-face and online health information

management programs at two-year colleges.

4.   What are perceptions, as related to course satisfaction, among students of an

online health information management course in a two-year associate's program?

Research Design

According to Bluman (2015), "Statistics is the science of conducting studies to

collect, organize, summarize, analyze, and draw conclusions from data" (p. 2), thus

providing the very foundation of research. The formulation of the research problem and

questions used in a study impacts the decision about what type of information is gathered

to answer the questions (Creswell & Poth, 2017). A quantitative approach was chosen

for this study. Quantitative methods afford the use of numbers and numerical

relationships with the ability to manipulate and capture patterns, make predictions, and

test theories (Bluman, 2015). Furthermore, quantitative research is more systematic with research questions that are more specific and restricted, differing from the broader qualitative research method which concentrates more on the importance of observations (Almalki, 2016).

Quantitative data can be either discrete, which assumes the values can be counted, or continuous, which assumes an unlimited number of values exist between two given values (Bluman, 2015). Quantitative data are acquired by measuring and frequently include fractions and decimals (Bluman, 2015). The purpose of a quantitative research design is to produce results which are objective, reliable, valid, and reproducible (Almalki, 2016). Moreover, in comparative research using quantitative tools, one can equate using numbers as values to illustrate differences or one can assign numerical values to qualitative entries to label a rank order (Rahman, 2017).

The views of participants are used with qualitative research, and data are gathered through observation or open-ended questioning, allowing for multiple and varied answers (Creswell & Poth, 2017). Qualitative research is concerned with the details of how things occur and the human significance of an event or activity (Fraenkel et al., 2015). Independent and dependent variables and hypothesis testing are not utilized in the qualitative research method, rather qualitative methodology is used to collect data on a phenomenon of interest where there is little to no knowledge about the phenomenon (Creswell & Creswell, 2018).

The analysis of qualitative data involves breaking down observations into patterns or themes that can be used to identify concepts from which theories can be tested and retested for validity (Fraenkel et al., 2015). Qualitative research contributes to a better

understanding of human motives and processes (Rahman, 2017). With the ranking of

ordinal data collected using the qualitative method, an attitude scale is used where each

category is called a point and can be analyzed for any relationship (Fraenkel et al., 2015).

This quantitative approach has a non-experimental design using surveys and

close-ended questions for the collection of data which was used to test hypotheses, verify

the Community of Inquiry theory, and measure information numerically (Creswell &

Creswell, 2018). Student attitudes were measured using a five-point Likert-type scale

and were used to categorize student perceptions of satisfaction with online health

information management courses based on the Community of Inquiry theory (Fraenkel et

al., 2015). The collection and analysis of multiple sets of quantitative data were carried

out to evaluate the differences, if any, of exam scores and attrition rates between students

in courses delivered face-to-face and students in online courses.

Population and Sample

A targeted population is described as a population that researchers would ideally

like to generalize with the results from a study (Fraenkel et al., 2015). Unfortunately,

many times researchers are not entitled to this type of population and are limited to the

accessible population (Fraenkel et al., 2015). The targeted population for this study is

comprised of 23,210 students in health information management associate's degree

programs across the United States (CAHIIM, 2016, p. 3). By using a larger population,

the results are more likely to be generalizable (Fraenkel et al., 2015). An acceptable

satisfactory response rate for this study was between 30 and 3,000 participants.

A second population for this study consisted of 256 directors of health

information management programs, who were asked to provide data on the methods used

to deliver courses and the scale scores and domain scores of graduates on the national

Registered Health Information Technician exam. Data were only obtained from the

educational institutions through program directors. The number of participants were

limited by volunteer response to provide Registered Health Information Technician

scoring data of associate health information management programs. An acceptable

response for this study was between 30 to 200 participants.

The type of sample used in this study was simple random voluntary sampling, or

self-selected sampling, in which the members of the population decide if they wish to be

included in the research (Creswell & Creswell, 2018). Using a random sampling

technique allowed all members of the selected population equal opportunity to be

selected (Bluman, 2015). It was felt the personal nature of the data collected could

possibly prevent participation, making a systematic or stratified sampling inadvisable, but

by including all health information management associate programs a much larger

sample was possible allowing for greater generalization (Fraenkel et al., 2015).

Instrumentation

Data from the program directors of health information management associate

degree programs were collected. A researcher-created data collection tool was developed

identifying data elements to be collected using an appropriate format (see Appendix B).

Data collected were to include student scale scores and seven domain scores from the

national Registered Health Information Technician exam. Also included in the collection

was identification of the type of course format used in the program and the program's

attrition rate. A pilot test of this data collection tool was conducted utilizing a sample of

directors of health information management bachelor's degree programs after

investigating and verifying that an appropriate instrument did not already exist (Watzlaf & Forrestal, 2017).

The Community of Inquiry instrument, developed by a research team led by Dr. Randy Garrison, was utilized to collect data (Garrison et al., 2000). The survey was developed from groups of indicators or key words and phrases, which were placed into categories used to identify cognitive, social, and teaching presence elements of the Community of Inquiry model (Garrison et al., 2000). The Community of Inquiry survey underwent validation, which has been published in several articles (Arbaugh et al., 2008; Swan et al., 2008).

The Community of Inquiry instrument was used to collect attitude scales requiring subjects to select a number that corresponds to how they feel about their experiences taking online courses (Fraenkel et al., 2015). The advantage to using this type of instrument was it can be distributed through a web-based survey to large numbers of subjects at the same time. Disadvantages of administering this type of instrument were that subjects may not fully understand the meaning of the statements or may not respond sincerely (Bluman, 2015).

Permission to use the Community of Inquiry survey instrument with online health information management students was granted by Dr. Randy Garrison (see Appendix C). The Community of Inquiry survey instrument was downloaded from the Community of Inquiry (2016b) organization website. In addition to the 34 statements of the instrument (The Community of Inquiry, 2016b), seven questions of demographic nature were included (see Appendix D). The design of the Community of Inquiry survey instrument yielded a three-factor model (The Community of Inquiry, 2016b). Factor one (Teaching

Presence) was highlighted in items 1-13, factor two (Social Presence) was highlighted in

items 14-22, and factor three (Cognitive Presence) was highlighted in items 23-34 (The

Community of Inquiry, 2016b). Cronbach's Alpha produced the internal consistencies

equal to 0.95 for Cognitive Presence, 0.91 for Social Presence and 0.94 for Teaching

Presence validating factor representation and interpretability (Arbaugh et al., 2008, p.

135; Swan et al., 2008, p. 6).

Data Collection

Permission to conduct this study was requested to the Lindenwood University

Institutional Review Board. Once permission was granted from the Lindenwood

University Institutional Review Board (see Appendix E), data collection for this study

began. A letter requesting permission to conduct research was emailed to each program

director of the CAHIIM accredited two-year associate program listed in the online

CAHIIM program directory (see Appendix F). The response rate was limited due to the

end of the spring semester and many program directors were on summer vacation. It was

decided to delay collection until fall semester began. Multiple Institutional Review

Board applications were submitted to the institutions of program directors who responded

affirmatively to the initial request for permission to conduct research.

After permission to conduct research letters were signed and on file, during the

second week of the fall semester, an introductory email was sent out to all health

information management associate program directors asking them to participate in the

study (see Appendix G). The Lindenwood Survey Research Information Sheet (see

Appendix H) was sent via email to the program directors, along with the Qualtrics Survey

link including careful instructions, access codes, and a detailed explanation of the importance of this research study.

In addition, a Qualtrics Survey instrument was created using the Community of Inquiry instrument tool. An introductory letter and request to participate (see Appendix I) was attached to the email sent to all online health information management program directors to include a link to the Community of Inquiry Qualtrics survey, access codes, and the Lindenwood Survey Research Information Sheet (see Appendix J) to be forwarded to students in online courses. A two-week and five-week follow-up email was sent to all health information management program directors encouraging participation in the study. In addition, the two-week and five-week follow-up emails included a request that students in online courses be encouraged to participate in the Community of Inquiry Qualtrics survey with a reminder of the end date. After the deadline had passed, the surveys were closed, and the data were exported into Excel spreadsheets for analysis. Data collection concluded at the end of six weeks.

An external secondary data source was released by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM) in July 2018. The Annual Program Assessment Report (APAR) data from academic year 2015-16 were made available in an Excel Workbook on the CAHIIM (2018) website. De-identified program data from undergraduate, associate and baccalaureate health information management CAHIIM (2018) accredited programs were presented. The APAR Excel Workbook allowed users to view and sort information and provided data items including program education level, content delivery, and number of students enrolled, graduate, and attrition rates of each program (CAHIIM, 2018).

Data Analysis

      Measures of central tendency. Where data are centered or clustered is the focus

for measures of central tendency, and these data are used to produce the mean and

standard deviation of a data set (Fraenkel et al., 2015). Data dispersion was assessed by

calculation of the standard deviation (Bluman, 2015). Data that are clustered more

closely around the mean produce a small standard deviation, whereas, a larger standard

deviation indicates the data have a broader dispersion (Salkind, 2017). The measures of

central tendency were determined for the Registered Health Information Technician final

exam scores data set to produce mean and standard deviation values.

      The *t*-test method. The *t*-test is used to "compare the mean scores of two

different, or independent, groups" (Fraenkel et al., 2015, p. 234). The samples under

study must be taken from two normally or approximately normally distributed

populations, the standard deviation is not known, and it is assumed the variances are not

equal (Bluman, 2015). A two-tailed *t*-test was performed to determine if the difference

between means was within the parameters to reject, or fail to reject, the null hypothesis.

The *p*-value is a numerical value obtained from the *t*-test (Bluman, 2015). The level of

significance is the maximum probability of committing a Type I error, which occurs

when the null hypothesis is rejected, and it is in fact found to be true (Fraenkel et al.,

2015). The level of significance for this study was set at $\alpha = .05$.

      The *F*-test method. The *F*-test is used to compare two standard deviations or

variances (Fraenkel et al., 2015). Before using the *F*-test method, data must be obtained

from random sampling and the populations must be normally distributed (Bluman, 2015).

The samples must also be unpaired or independent (Bluman, 2015). An *F*-test was

performed to determine if the difference between variances was within the parameters to reject, or fail to reject, the null hypothesis (Salkind, 2017). The level of significance for this analysis was set at α = .05.

The single factor analysis of variance (ANOVA) test. The ANOVA was used to determine if there were any significant differences between means of three or more independent groups by analyzing variances (Bluman, 2015). The ANOVA is used to test the null hypothesis and assumed homogeneity of variance when populations are normally distributed and each value is independent from each other (Salkind, 2017). The *p*-value is a numerical value obtained from the ANOVA test (Bluman, 2015). The level of significance for this analysis was set at α = .05.

The *z*-test for two proportions, two-tailed test. A test for two proportions is generally used to calculate differences in a proportion of one category from another (Fraenkel, et al., 2015). A fraction, decimal, or percentage states a proportion which represents part of a whole (Bluman, 2015). A *z*-test was used to test if the difference between proportions is within the parameters to reject, or fail to reject the null hypothesis (Salkind, 2017). The level of significance for this analysis was set at α = .05.

Factor analysis. Principal component analysis is a statistical test used to analyze the interrelationships of a large number of variables with a scale and construct these variables into a smaller number of common underlying factors (Creswell & Creswell, 2018). Factor analysis is a statistical test used to assess the validity of an instrument or tool to ensure the instrument measures appropriately (Salkind, 2017). A principal component analysis was performed to check for validity of the Community of Inquiry instrument, and a factor pattern matrix was developed validating the correlation of

coefficients of the instrument and the common factors of *Cognitive, Social,* and

Teaching.

 Scale reliability analysis. The alpha reliability statistic (Cronbach's alpha)

measures how closely a set of variables measure a construct or factor (Swan et al., 2008).

With statistical analysis of questionnaire data and all instruments, it is important that the

scores are reliable and valid (Fraenkel et al., 2015). Cronbach's alpha was performed to

check for internal consistency and reliability of the Community of Inquiry survey

instrument responses.

Ethical Considerations

 To perform this study, approval through Lindenwood University Institutional

Review Board (IRB) was mandatory. This study did not discriminate among the subjects

in the populations and allowed for equitable selection through self-selected participation

(Fraenkel et al., 2015). Autonomy was addressed through informing subjects of any risks

and benefits regarding participation and allowing the subjects to volunteer or decline

participation (Creswell & Creswell, 2018). The research was intended to contribute to

the Health Information Management Body of Knowledge, an online resource used by

health information management professionals, and to benefit health information

management educators as well as future students of online health information

management courses (Watzlaf & Forrestal, 2017). To demonstrate an understanding of

ethical considerations, and to be approved through the Lindenwood University IRB,

National Institution of Health training on the protection of human research participants

was completed. After IRB approval was obtained, data were collected to satisfy the

methodology selected for this study.

 To assure confidentiality and anonymity, safeguards were established throughout

the data collection and analysis phases. The safeguards included, yet were not limited, to

the following:

To assure confidentiality. Data were collected in a manner that did not require

identification of subjects. Collected data in the form of documents were stored in a

locked cabinet or file under the supervision of the researcher. Collected data in the form

of electronic files were secured by password protection on a password-protected personal

computer on a secured site. All documents and files will be destroyed three years from

completion of the research project.

To assure anonymity. All information was collected anonymously through

online Qualtrics surveys. All participation was voluntary with no identifiable data to be

collected on subjects.

Overall. Each participant received a Lindenwood Survey Research Information

Sheet included with an email, which described in detail the purpose of the research, any

possible risks, and the opportunity to opt out of the study any time without negative

effects. The email was sent by program directors and faculty, further ensuring anonymity

of subjects.

Summary

Even as overall enrollment in higher education has become nearly stagnant, the

demand for online education has grown (Clinefelter & Aslanian, 2016). Questions

continue to arise as to the overall quality of online education as well as the satisfaction

and completion of students of online programs (Singh & Hurley, 2017). The purpose of this study was to determine if there were statistical differences between health information management course learning outcomes offered online compared to traditional face-to-face offerings.

In this chapter, the research questions and design to be used in the research study were summarized. The population and sample, instrumentation, procedures to be used in data collection, and data analysis were described in detail. In addition, ethical considerations to protect participants of the study were explained. In Chapter Four, results of the data collected and analyzed are presented regarding the four research questions addressed in this study.

Chapter Four: Analysis of Data

The intent of this study was to explore whether significant differences exist in student pass rate scores of the national Registered Health Information Technician certification exam taken by students completing online education programs and students completing traditional face-to-face programs. Student attrition rates of online programs were compared to those of traditional face-to-face programs. In addition, student perceptions of satisfaction with the current online course offerings in health information management associate programs were also assessed. The increase of online education in the health information management discipline as well as the decline in the percentage of the pass rate for first time test takers of the Registered Health Information Technician certification exam raised concerns and formed the basis for this research (CAHIIM, 2016, p. 1; AHIMA, 2017a, p. 1). Due to the type of research questions analyzed, a quantitative approach was utilized.

This study was outlined by four questions, which were answered with quantitative data gathered from a total of five online education programs and four campus-based programs whose directors volunteered to participate during the spring and fall 2018 semesters. Quantitative data were also collected from current students enrolled in online health information management courses from the five online education programs and five face-to-face education programs in the study, which were utilized to answer research question number four. The first question was focused on whether there was a difference between students' scale scores of the Registered Health Information Technician exam based on the delivery format of the health information management associate program courses. Likewise, the second question addressed whether there was a difference

between the domain scores of the Registered Health Information Technician exam from graduates of online courses and traditional face-to-face courses of health information management programs. Data relating to the third research question were collected to determine if a difference existed in the attrition rates of traditional face-to-face and online health information management associate program students. The fourth and final question was centered on student perceptions of current online health information management courses in a two-year associate program.

Data Collection

Multiple quantitative data were collected and analyzed for a variety of purposes in the course of this study. All components of the quantitative data were gathered through survey instruments administered to program directors and students who participated in the study from accredited two-year associate health information management programs. Components included scale scores and domain scores of the Registered Health Information Technician exam as well as program attrition rates, which were compared for differences between traditional face-to-face and online health information management programs. Students provided the quantitative data analyzed for student perceptions of experiences with online health information management courses utilizing the Community of Inquiry survey instrument.

To provide further support of the analyzed data results presented, the Annual Program Assessment Report (APAR) data from academic year 2015-16 were utilized in further analysis (CAHIIM, 2018). The APAR data set was released by the Commission on Accreditation for Health Informatics and Information Management education (CAHIIM) in July of 2018 and published on the CAHIIM website. The data included in

this release were de-identified and contained self-reported program data from all

nationally CAHIIM (2018) accredited programs.

Instrumentation

To collect data from program directors regarding the program format, student

scale scores and domain scores from the national Registered Health Information

Technician exam and program attrition rates, a self-created data collection tool was

developed identifying data elements to be collected using an appropriate format. The

self-created data collection tool was then tested by two program directors of health

information management bachelor programs to ensure appropriate format and desired

responses for data. A survey instrument was then created based on the researcher-created

data collection tool and utilized for this research.

The Community of Inquiry instrument (The Community of Inquiry, 2016b),

which was developed by a research group led by Dr. Randy Garrison, was utilized to

collect data from students enrolled in health information management online courses.

The Community of Inquiry instrument was used to guide the collection of attitude scales

based on three factors; teaching presence, social presence, and cognitive presence from

students in online courses and was used to determine if these online courses have the

elements necessary to provide a good quality online educational experience (Garrison et

al., 2000). The survey instrument consisted of 34 questions in a 5-point Likert-type scale,

with *Strongly disagree* = 1 and *Strongly Agree* = 5 (Arbaugh et al., 2008). An additional

seven questions of demographic nature were added to the end of the Community of

Inquiry survey instrument. A survey instrument was then created based on the

Community of Inquiry instrument and utilized for this research.

Demographics

The population for this research study included the program directors for 256 health information management two-year CAHIIM accredited associate degree programs. The composition of the 256 programs consisted of 151 (59%) face-to-face programs, 75 (29%) online programs, and 30 (12%), which are both face-to-face and online or hybrid programs. A Permission Request Letter to Educational Institution was electronically mailed to each of the 256 program directors as required by Lindenwood Institutional Review Board. Of the 151 face-to-face programs, 19 (12.58%) responded *yes* to participation, 30 (19.87%) responded *no* to participation, and 102 (67.55%) did not respond at all. Of the 75 online programs, 10 (13.33%) responded *yes* to participation, 15 (20%) responded *no* to participation, and 50 (66.67%) did not respond at all. Of the 30 hybrid programs, 2 (6.7%) responded *yes* to participation, 2 (6.7%) responded *no* to participation, and 26 (86.7%) did not respond at all. This calculated to a 30.47% response rate of program directors.

The program directors who responded *yes* and returned a signed Permission Request Letter to Educational Institution, received a Survey Research Information Sheet and an Introductory Letter and Request to Participate to program directors through electronic mail, which contained a link and access code to the survey. The survey contained the Self-Created Data Collection Tool. This process was repeated at two weeks and five weeks prior to the termination of the survey on October 6, 2018.

A second population for this study included 69 adult students enrolled in online health information management courses at CAHIIM accredited two-year associate degree programs during the fall semester of 2018. The students received a Survey Research

Information Sheet and an Introductory Letter and Request to Participate for HIM

Students, which contained a survey link and access code, through electronic mail from

their program directors. This process was repeated at two weeks and five weeks until the

survey terminated on October 6, 2018. The survey contained the Community of Inquiry

Survey instrument. The delivery format, number of programs, and total types of

responses to participate in the study were collected (see Table 1).

Table 1

Delivery Format and Responses to Participate in Research Study

Delivery Format	Number of Programs	Yes Response	No Response	Unresponsive
Face-to-Face	151	19	30	102
Online	75	10	15	50
Campus/Online	30	2	2	26
Total	256	31	47	178

Note. N = 256.

Research Questions

The study was conducted to answer research questions which were quantitative in

nature, and the data collected were examined statistically. The Community of Inquiry

instrument and data representing students' observations of the quality of online health

information management courses were utilized to answer the fourth research question.

An alpha level of .05 was employed in all statistical analysis. The .05 alpha level was

selected because it denotes the standard level of significance reported in published studies (Bluman, 2015; Frankel et al., 2015).

Research question one. The first research question was: *What difference exists, if any, between the national Registered Health Information Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses?* The null hypothesis *(H1$_0$)* stated there was no difference between the national Registered Health Information Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peer enrolled in online health information management courses included in this study. A total of five online health information management program directors participated in the study during the spring and fall semester of 2018, providing 28 final exam scores of online graduates taking the national Registered Health Information Technician exam during academic year 2015-16. A total of four face-to-face health information management program directors participated in the study during the spring and fall semester of 2018, providing 28 final exam scores of face-to-face graduates taking the national Registered Health Information Technician exam during academic year 2015-16. These two samples were selected to test the null hypothesis. According to Bluman (2015), hypothesis analysis is a decision-making procedure for weighing assertions regarding a population, based on evidence acquired from samples.

The two-tailed *t*-test null hypothesis was, $H_{0:}$ $\mu_1 = \mu_2$, there is no difference between the mean scores of the national Registered Health Information Technician exam of graduates from traditional face-to-face health information management courses and

similar peers enrolled in online health information management courses. The alternative hypothesis was, H_1: $\mu_1 \neq \mu_2$, there is a difference between the mean scores of the national Registered Health Information Technician exam of graduates from traditional face-to-face health information management courses and similar peers enrolled in online health information management courses. To test the hypothesis, first the means were calculated from the sample data (Salkind, 2017).

The *F*-test null hypothesis was, H_0: $\mu_D = \mu_D$, there is no difference in the variability of mean scores of the national Registered Health Information Technician exam of graduates from traditional face-to-face health information management courses and similar peers enrolled in online health information management courses. The alternative hypothesis was, H_1: $\mu_D \neq \mu_D$, there is a difference in the variability of mean scores of the national Registered Health Information Technician exam of graduates from traditional face-to-face health information management courses and similar peers enrolled in online health information management courses. The *F*-test was used to measure how different or dispersed the scores were from one another using the mean (Salkind, 2017).

These samples were unpaired in that they were independent of each other. The samples were similar in that they contained the Registered Health Information Technician final exam scores of graduates, but were not the same because they came from different populations: graduates of traditional face-to-face health information management programs and graduates of online health information management programs. A two-tailed *t*-test was used to test the difference between the two means of the independent samples that were assumed to be normally or approximately normally distributed (Bluman, 2015).

Measures of central tendency. The mean and median of a data set are commonly known as measures of central tendency as these measures concentrate on where the data is centered or clustered (Fraenkel et al., 2015). The mean is useful in forecasting future outcomes when the data are void of extreme values; although, the effect of extreme values on the mean may be critical and should be pondered (Bluman, 2015). The median may be more suitable than the mean when the data set has extreme values as it is not disturbed by the extreme values (Salkind, 2017). Standard deviation is a tool for assessing data dispersion (Bluman, 2015). The smaller the standard deviation, the more closely the data are clustered around the mean (Salkind, 2017).

The measures of central tendency for the data set containing the Registered Health Information Technician final scores of online program graduates by points are displayed in Table 2. The measures of central tendency for the data set containing the Registered Health Information Technician final scores of face-to-face program graduates by points are displayed in Table 3. The online program final scores standard deviation of 33 showed a wide dispersion of data around the mean. Similarly, the face-to-face program final scores standard deviation of 24 also showed a wide dispersion of data around the mean.

Table 2

Measures of Central Tendency for RHIT Exam Scores of Online Program Graduates

Mean	Median	Standard Deviation
299	296	33

Note. N =26

Table 3

Measures of Central Tendency for RHIT Exam Scores of Face-to-Face Program
Graduates

Mean	Median	Standard Deviation
333	332	24

Note. N = 28.

Outliers. According to Bluman (2015), outliers are exceedingly elevated or

extremely depressed values within a data set. The interquartile range (IQR) method was

used to determine whether any outliers were present in the data set. This was calculated

for any data value lesser than Q1 - 1.5(IQR) or greater than Q3 + 1.5(IQR). Using the

interquartile range method, the lower IQR limit for online program data was 193.75 and

the upper IQR limit was 411.75 scores. The interquartile range method produced two

data values of graduate final exam scores lower than the lower IQR limit of 193.75.

Bluman (2015) stated an outlier can heavily influence the mean and standard deviation of

a variable making them appear greater than they were. For this reason, the two data

values lower than 193.75 score were removed from the data set.

Using the interquartile range method, the lower IQR limit for face-to-face

program data were 271.50 and the upper IQR limit were 395.50 scores. The interquartile

range method failed to produce any sample lower or higher than the IQR calculated

limits. For this reason, no sample was removed from the face-to-face program data set.

Pearson Index. The Pearson index of skewness was performed to determine the

skewness of distribution. The formula is PI = [3(X - MD)]/s (Bluman, 2015). For the

online program data set, Pearson's index of skewness was 0.29, and for the face-to-face

program data set Pearson's index of skewness was 0.072. Bluman (2015) stated values that lie between +1 and -1 are not significantly skewed. Based on the Pearson's index of skewness, both data sets were not determined to be significantly skewed (Bluman, 2015). Because the data are normally distributed, a two-tailed *t*-test was performed on the means to test the hypothesis (Bluman, 2015).

The t-test method. The independent *t*-test is used to analyze the dissimilarity between means when two samples are unconnected and when the samples are acquired from two normally or more or less normally dispersed populations and the population standard deviation is not known (Bluman, 2015). In this study it was assumed the variances were not equal (Bluman, 2015). An independent two-tailed *t*-test, two-sample presuming disproportionate variances, was performed to determine if the difference between means was within the parameters to reject or fail to reject the null hypothesis (Fraenkel et al., 2015). The *t*-stat is the value of the *t* statistic and is compared to the *t*-critical two-tail value, both of which are numerical values (Salkind, 2017). The *p*-value is also a numerical value obtained from the *t*-test and is used to substantiate the findings (Salkind, 2017). The level of significance is the maximum probability of performing a type I error, which transpires when the null hypothesis is rejected and is in fact found to be true (Bluman, 2015). The level of significance for this study was set at $\alpha = .05$.

The F-test method. The *F*-test is a statistical test used to assess similarities between two variances or standard deviations (Fraenkel et al., 2015). Before one can use the *F*-test method to determine the differences between two variances, assumptions must be met. Samples must be random, and the populations from which the samples were gathered must be normally distributed (Bluman, 2015). The samples must also be

unrelated or unpaired of one another (Bluman, 2015). An *F*-test was performed to determine the variability in the national Registered Health Information Technician final exam scores between graduates of face-to-face health information management courses and similar peers enrolled in online health information management courses. The level of significance is the maximum likelihood of committing a type I error, which transpires when the null hypothesis is rejected and is in fact found to be true (Salkind, 2017). The level of significance for this study was set at $\alpha = .05$.

   Results. The results of the independent two-tailed *t*-test analysis revealed a *t* statistic for two samples assuming unequal variances at - 4.19 and a *t* critical two-tail value at ± 2.014. Since - 4.19 < - 2.014, there was evidence to suggest there exists a statistical difference between the means that is not due to chance (Salkind, 2017). The *p*-value of .00012 confirmed this difference and thus, the null hypothesis was rejected at α = .05. Thus, there was sufficient evidence to conclude there exists a statistical difference between the means of the national Registered Health Information Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses. The independent two-tailed *t*-test, two-sample assuming unequal variances, results are displayed (see Table 4).

Table 4

Summary of t-test Two-Tail Analysis of Final Exam Means Based on Delivery Format

Program Format	Observations	(*df*)	*t*-value	$P(T \leq t)$	$T(t_{crit})$
Online	26	45	- 4.19	*.00	± 2.01
Face-to-Face	28				

Note. **p*-value < *α* = .05 indicating a significant difference in means.

The results of the *F*-test revealed an *F*-value of 1.99; thus, the null hypothesis was rejected at *α* = .05. Therefore, it was assumed the variances were not equal, and there was statistical evidence at *α* = .05 to support the alternative hypothesis that there was a difference in the variability of the Registered Health Information Technician final exam scores of graduates between two intact samples of face-to-face and online programs. The *p*-value of .0417 substantiated the difference and the rejection of the null hypothesis at *α* = .05 significance level. The results of the *F*-test analysis of the variance on the final exam scores from graduates of face-to-face health information management courses and graduates of online health information management courses are displayed (see Table 5).

Table 5

F-test Analysis of Variance Based on Course Delivery Format, Academic Year 2015-16

Program Format	Mean	^{a}Variance	Observations	(*df*)	*F*-value	$P(F < f)$	$F(F_{crit})$
Face-to-Face	332.57	562.40	28	27	1.9889	0.04	1.92
Online	299.26	1118.60	26	35			

Note. ^{a}Variance based on the samples being analyzed.

Research question two. The second research question was: *What difference exists, if any, between the national Registered Health Information Technician domain scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses?* The null hypothesis *(H2$_0$)* was there is no difference between the national Registered Health Information Technician domain scores from graduates of traditional face-to-face health information management courses and similar peer enrolled in online health information management courses included in this study.

Participating program directors provided the seven domain scores of a total of 28 student graduates of health information management two-year online programs and a total of 28 student graduates of health information management two-year traditional face-to-face programs. The seven domains are competencies, also known as knowledge, skills, and abilities, which are grouped representing similar and specific areas of content. Each of the seven domains are weighted in comparison to one another, and then assessed by the number and difficulty of test questions relative to other domains (AHIMA, 2017b). The domains and weighted percentages assessed in the Registered Health Information

Technician exam were as follows: Domain I – Data Analysis and Management (18-22%),

Domain 2 – Coding (16-20%), Domain 3 – Compliance (14-18%), Domain 4 –

Information Technology (10-14%), Domain 5 – Quality (10-14%), Domain 6 – Legal (9-

13%), and Domain 7 – Revenue Cycle (9-13%) (AHIMA, 2017b).

 The t-test method. An independent two-tailed *t*-test was conducted on the each of

the seven domains to establish if there was a significant variation in the means between

the face-to-face and online delivery format (Bluman, 2015). The level of significance for

this test was set at $\alpha = .05$. The results of the *t*-test on the seven domains' means are

displayed (see Table 6).

 Results. The results of the *t*-tests on the mean domain scores for the two different

course delivery formats presented in Table 6 indicated a statistical difference in four of

the seven domain scores based on format for course delivery, because the calculated *p*-

value of .0053 (Domain 1), .0002 (Domain 3), .000006 (Domain 5), and .0005 (Domain

6) were less than $\alpha = .05$ (Bluman, 2015). The *p*-value of Domain 2 (.1877), Domain 4

(.9285), and Domain 7 (.1280) exceeded $\alpha = .05$ indicating no statistical difference in

these three domain scores based on format for course delivery (Bluman, 2015). It is also

important to note that the mean score for Domain 4 was the same for online in

comparison to the face-to-face mean score.

Table 6

Comparison of Domain Score Means from Online and Face-to-Face Graduates Exams

	Online		Face-to-Face		
Variables	*M*	*SD*	*M*	*SD*	*p*-value
Domain 1	61	15	71	12	*.01
Domain 2	65	16	70	10	.19
Domain 3	60	17	76	12	* < .001
Domain 4	66	13	66	13	.93
Domain 5	50	16	70	13	* < .001
Domain 6	64	16	77	9	* < .001
Domain 7	60	20	68	15	.13

Note. *p-value < α = .05 indicating a significant difference in means.

A single factor analysis of variance (ANOVA) test. A single factor analysis of variance (ANOVA) test was utilized to ascertain if there was a significant variation amongst the average seven domain scores on the Registered Health Information Technician exam from graduates in each of the two different delivery formats. The ANOVA test provided a different result from the individual *t*-tests performed on each domain score. The results of the ANOVA test on the mean seven domain scores are displayed (see Table 7).

Results. The results of the one-way ANOVA test on the seven domain scores for these two different course delivery formats presented in Table 7 indicated the *F* value of 6.512 was greater than the critical value of 1.75, thus the null hypothesis was rejected.

The *p*-value of less than .001 also indicated the probability was less than 5% on any one

test of the null hypothesis that the average scores of each group differed due to chance

alone. Therefore, it was concluded there was a significant difference among the seven

sets of domain scores. A comparison of online course and face-to-face course domain

mean scores is shown in Figure 2.

Table 7

Analysis of Variance Based on Course Delivery Format, Academic Year 2015-16

Source of Variation	SS	df	MS	F-value	P-value	F_{crit}
Between Groups	17518.11	13	1347.55	6.512	< .001	1.75
Within Groups	78210.75	378	206.91			
Total	95728.86	391				

Note. $N = 28$.
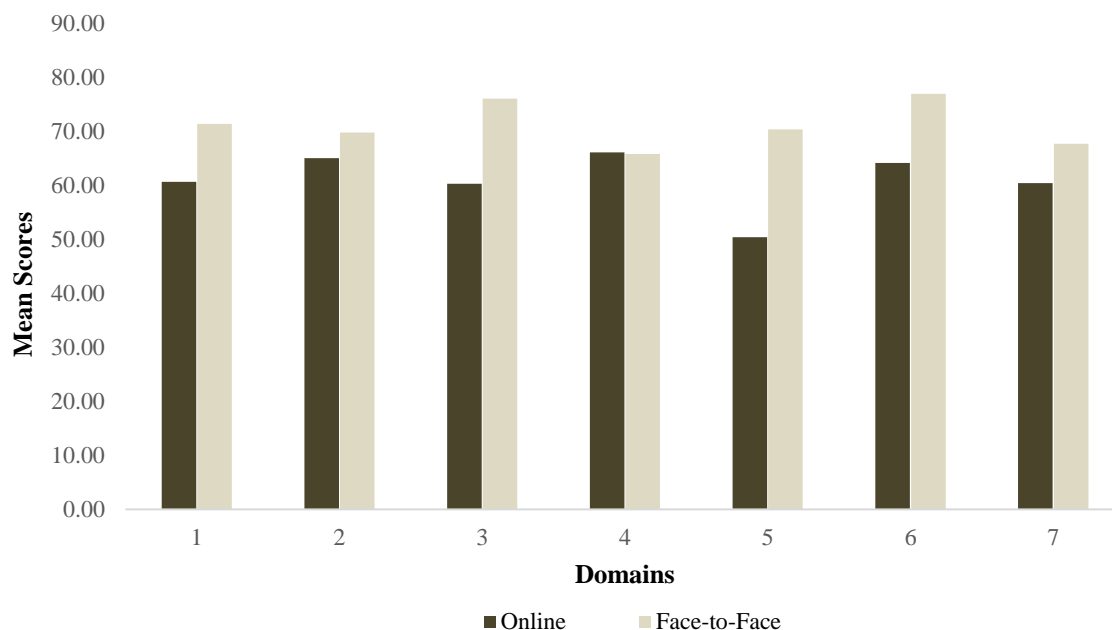
Figure 2. Domain mean scores for the 2015-2016 academic year. Comparison of the seven domain mean scores between online and face-to-face health information management graduates for academic year 2015-16.

Research question three. The third research question was: *What difference exists, if any, between health information management attrition rates among graduates of traditional face-to-face and online health information management programs at two-year colleges?* The null hypothesis *(H3_0)* was there is no difference between health information management attrition rates among graduates of traditional face-to-face and online health information management programs at two-year colleges. There were five online health information management program directors who participated in the study during the spring and fall semester of 2018, providing five attrition rates of the programs. There were four face-to-face health information management program directors who

participated in the study during the spring and fall semester of 2018, providing four

attrition rates of the programs. These two samples were selected to test the hypothesis.

The t-test method. An independent two-tailed *t*-test was used to test the

difference between means of these two independent samples. The Pearson index of

skewness suggested the online data set was significantly skewed at 1.43. Bluman (2015)

noted values between +1 and -1 indicate the data are not significantly skewed. Based on

the Pearson's index of skewness, the outlier value of 7 was removed from the online

programs data set. The *t*-test was performed on the resulting means to test the

hypothesis. The *t*-critical value and *p*-value are the numerical values obtained from the *t*-

test used to confirm if a difference exists between attrition means.

Results. The results of the *t*-test, two-sample assuming unequal variances,

revealed a mean of 51.25 for online programs and a mean of 49 for face-to-face

programs. The degrees of freedom was 5, and the *t*-statistic was .079. The *t*-critical for

two-tail was ± 2.571. Thus, the null hypothesis was not rejected, and it was concluded

there was no statistical difference between attrition rates of online programs and face-to-

face programs, which was further substantiated since $p = .94$. The results of the *t*-test,

two-sample supposing unequal, variances are displayed (see Table 8).

Table 8

Summary of t-test Two-Tail Analysis of Attrition Means Based on Delivery Format

Program Format	Observations	(*df*)	*t*-value	$P(T \leq t)$	$T(t_{crit})$
Online	4	5	0.079	*0.94	2.571
Face-to-Face	4				

Note. *p*-value > α =.05 indicating no difference in means.

2015-2016 annual program assessment report data. Additional statistical tests were conducted on the data provided in the Annual Program Assessment Report (APAR) from academic year 2015-16, which was released by the Commission on Accreditation for Health Informatics and Information Management education (CAHIIM) in July of 2018. The APAR worksheet showed the enrollment, graduation, and attrition numbers on all health information management programs for the academic year 2015-16. The data set was filtered to reveal two-year associate programs and then further filtered to reveal the online health information management programs' and face-to-face health information management programs' data.

The attrition rate for 72 online health information management programs was calculated by dividing the total attrition of students by the total students minus the total graduates, (2731/ (10579 - 2155) = 2731/8424 *100 = 32%) (James et al., 2016). The retention rate was calculated by dividing the total remaining students by the total students minus the total graduates, (8424 - 2731) = 5693/8424 *100 = 68%). The attrition rate for 62 face-to-face health information management programs was calculated in the same manner as the online programs, (745/(3394 - 959) = 745/2435 *100 = 31%). The retention rate was calculated by dividing the total remaining students by the total students minus the total graduates, (2435 - 745) = 1690/2435 *100 = 69%. Based on the results of the APAR calculations, there was not a significant difference in attrition or retention rates between online and face-to-face health information management two-year programs. The results of the statistical tests are displayed (see Table 9). These results are consistent with those of the study sample data.

Table 9

Summary of Attrition and Retention Rates for Health Information Management

Programs

Program Format	Total Students	Total Graduates	Total Attrition	Attrition Rate	Retention Rate
Online	10579	2155	2731	32%	68%
Face-to-Face	3394	959	745	31%	69%

Note. Data from published annual program assessment reports, academic year 2015-16.

Tests for two proportions. To compare the proportion of online and face-to-face program attrition rates for academic year 2015-16, a test for two proportions was calculated in Excel with XLSTAT. A proportion denotes part of a whole, and can be stated as a percentage, decimal, or fraction (Bluman, 2015). A test for two proportions is commonly used to determine if there is a difference in a proportion of one category compared to another category, in this case online students versus face-to-face students (Fraenkel et al., 2015). The data format is frequencies and sample sizes. A *z*-test is then used to test the hypothesis. This test was performed on the data provided in the APAR released publicly on the Commission on Accreditation for Health Informatics and Information Management education (CAHIIM, 2018) website.

The z-test for two proportions, two-tailed test method. The test for two proportions was performed to test the null hypothesis that there was no significant difference between online and face-to-face programs attrition rates. Proportion One was the online total student attrition value (2731) and Sample Size One was the number of remaining students in the programs after graduates were removed (8424) (James et al.,

2016). Proportion Two was face-to-face total student attrition value (745), and the

Sample Size Two was the number of remaining students in the programs after graduates

were removed (2435). A z-test was selected to analyze the data. A 95% confidence level

as well as an alternative hypothesis of Proportion 1 – Proportion 2 < D, where D is 0

were selected, since the proportion of online program attrition rate is dissimilar to that of

the face-to-face program attrition rate. Calculations conveyed a p-value of .091, which is

larger than α = .05 indicating the null hypothesis should not be rejected and that there was

no significant difference between attrition rates of the online programs versus the face-to-

face programs. The results of the z-test for two proportions are displayed (see Table 10).

Table 10

Summary of the z-test for Two Proportions, Two-tailed Test

Difference	z (Observed value)	z (Critical value)	p-value (Two-tailed)
0.018	1.689	1.960	*.09

Note. *p-value > α = .05 indicating no difference between the proportions.

Research question four. Data pertaining to the final research question which

guided this study were analyzed using quantitative methods. Research question number

four was: *What are perceptions, as related to course satisfaction, among students of an*

online health information management course in a two-year associate's program?

Quantitative data were collected with an online survey, which was provided to students of

online health information management courses of the online programs whose program

director volunteered to participate in this study. The five online health information

management program directors who participated in the study forwarded electronic mail

containing a link to an online Community of Inquiry survey to current students taking

online health information management courses. A total of 69 students of online health

information management courses responded to the request to participate. An Excel

spreadsheet containing de-identified student data was downloaded from the survey

website for analysis when the survey closed. Of the 69 responses, 62 responses that were

100% complete were utilized. Those that were less than 100% complete, or had missing

answers, were removed from the data set before analysis.

Population analysis. Demographic data were also collected as part of the survey.

The Community of Inquiry survey Participants' age ranges and genders were as follows:

18% were within the 52-70 age range, 27% were within the 18-32 age range, and the

majority at 55% were within the 33-51 age range. There were 57 female participants,

four male participants, and one participant did not identify their gender. The

demographic statistics are displayed (see Figure 3). The participating students reporting

attendance status were equal at 50% for full-time and 50% for part-time enrollment in

courses. Participants reported the following: 73% were employed while attending

college, 48% were working in the healthcare industry, and 40% were working within the

31-40 hour a week range.
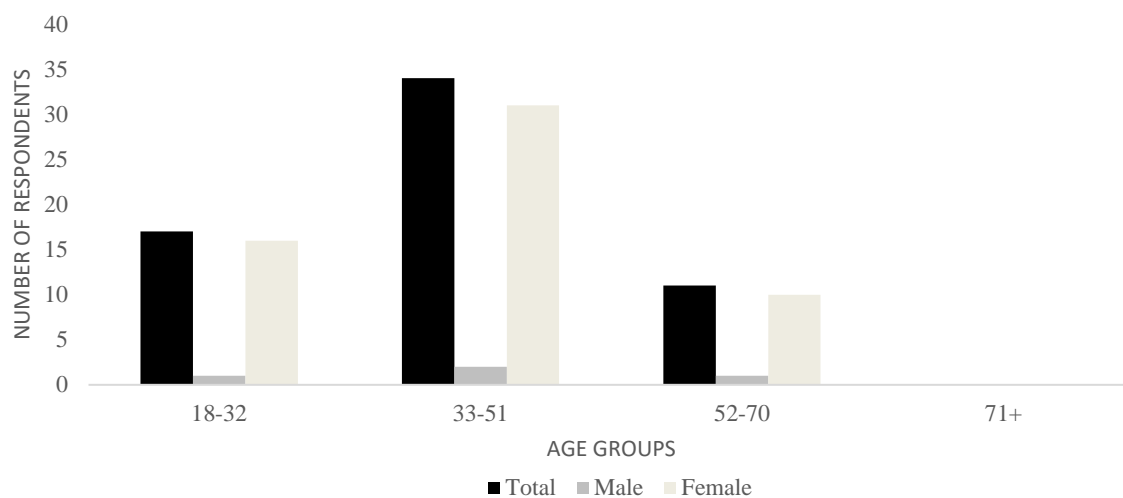
Figure 3. Histogram of the reported age range and gender of students in online health information management courses.

Community of Inquiry. Each item in the Community of Inquiry survey required a Likert-type scale response by students rating from one as *strongly disagree* to five as *strongly agree* if they perceived the item being apparent in their online courses. The sample size for this study was reasonably acceptable at 62 responses for each of the 34 items measured. According to Keyser-Meyer-Olkin (KMO) measure of sampling sufficiency, the study measured at 0.80 suggesting the factor analysis should produce discrete and consistent factors given the available data (Swan et al., 2008).

Factor analysis. Principal Components Analysis was performed for correlation of variables and grouping of the moderately or highly correlated variables into factors or constructs (Fraenkel et al., 2015). Based on literature, there is some degree of overlap between these factors, as expected when used with psychological constructs (Garrison & Arbaugh, 2007). The Community of Inquiry instrument design was found to be

consistent with the three-factor model, with items 1-13 representing the *Teaching Presence* construct loaded most strongly on Factor 1, items 14-22 representing the *Social Presence* construct most strongly loaded on Factor 2, and lastly, items 23-34 representing the *Cognitive Presence* construct loaded most strongly on Factor 3. Outcomes are displayed in the Factor Pattern Matrix (see Appendix K).

 Scale reliability analysis. Researchers who designed of the Community of Inquiry instrument tested for reliability of internal consistencies utilizing Cronbach's Alpha yielding 0.91 for Social Presence, 0.94 for Teaching Presence, and 0.95 for Cognitive Presence (Arbaugh et al., 2008, p. 135; Swan et al., 2008, p. 6). Cronbach's Alpha coefficient (Cronbach, 1951) was carried out in this study to test the scale reliability using internal consistency coefficients of the constructs included in the Community of Inquiry survey provided to students of online health information management courses. Results of this statistical test typically range from 0.00 to 1.00, and the closer the alpha is to the number 1.00, the greater the correlation among the items in the construct examined (Vaske, Beaman, & Sponarski, 2016). Analysis of the current study data produced high-level reliability indicators (Cronbach's Alpha) for every element of the Community of Inquiry survey centering on teaching, social and cognitive presence respectively: (a) teaching presence = 0.95, (b) social presence = 0.90, (c) cognitive presence = 0.94.

 Descriptive statistics. Composite mean and standard deviation scores for each of the 34 items in the Community of Inquiry survey instrument were calculated. The mean scores ranged from 3.61 to 4.45, calculating a standard deviation range of 0.74 to 1.22. Significant mean scores in each of the constructs are discussed below.

Teaching presence. The teaching presence item 2, *The instructor clearly communicated important course goals,* scored the highest mean at 4.45, with 55% of students selecting *strongly agree* with this statement. Similarly, for item 4, *The instructor clearly communicated important due dates/time frames for learning activities*, 55% of students selecting *strongly agree* with this statement. Teaching presence entries collectively produced a mean score of 4.14 (*SD* = 0.94). This mean score reflected a greater degree of satisfaction by students with the teaching presence factor in online courses. The means and standard deviations for the specific teaching presence indicators are displayed (see Table 11).

Table 11

Analysis of the Mean and Standard Deviation for Teaching Presence Factor

Community of Inquiry Statement	*M*	*SD*	*N*
1. The instructor clearly communicated important course topics.	4.31	0.801	62
2. The instructor clearly communicated important course goals.	4.45	0.739	62
3. The instructor provided clear instructions on how to participate in course learning activities.	4.37	0.814	62
4. The instructor clearly communicated important due dates/time frames for learning activities.	4.44	0.781	62
5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	3.84	1.134	62
6. The instructor was helpful in guiding the class toward understanding course topics in a way that helped me clarify my thinking.	4.13	0.949	62
7. The instructor helped to keep course participants engaged and participating in productive dialogue.	4.02	1.063	62
8. The instructor helped keep the course participants on-task in a way that helped me to learn.	4.13	0.914	62
9. The instructor encouraged course participants to explore new concepts in this course.	4.32	0.763	62
10. Instructor actions reinforced the development of a sense of community among course participants.	4.05	0.931	62
11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	4.06	1.038	62
12. The instructor provided feedback that helped me understand my strengths and weaknesses.	3.94	1.006	62
13. The instructor provided feedback in a timely fashion.	3.71	1.220	62

Note. *N* = 62.

Social presence. The second factor, social presence, item 22, *Online discussions*

helped me to develop a sense of collaboration, was scored the lowest, with a mean of

3.61; 13% of students surveyed answered *disagree,* and 5% *strongly disagree* with this

statement. Slightly more than one-fourth of students surveyed remained *neutral* at 26%.

The social presence indicators produced a mean score of 3.90 (*SD* = 0.98). The means

and standard deviations for the social presence indicators are displayed (see Table 12).

Table 12

Analysis of the Mean and Standard Deviation for Social Presence Factor

Community of Inquiry Statement	*M*	*SD*	*N*
14. Getting to know other course participants gave me a sense of belonging in the course.	3.76	1.155	62
15. I was able to form distinct impressions of some course participants.	3.69	1.080	62
16. Online or web-based communication is an excellent medium for social interaction.	3.76	1.066	62
17. I felt comfortable conversing through the online medium.	4.16	0.814	62
18. I felt comfortable participating in the course discussions.	4.15	0.865	62
19. I felt comfortable interacting with other course participants.	4.10	0.900	62
20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	3.81	0.989	62
21. I felt that my point of view was acknowledged by other course participants.	4.06	0.807	62
22. Online discussions helped me to develop a sense of collaboration.	3.61	1.164	62

Note. N = 62.

Cognitive presence. The final and third factor, cognitive presence items, generated a mean score of 3.94 (*SD* = 0.91). Item 28, *Online discussions were valuable in helping me appreciate different perspectives*, had a mean score of 3.81 and reflects 10% of students surveyed selecting *disagree* in response to the statement. Item 23, *Problems posed increased my interest in course issues*, had a 31% response of *neutral* to the statement. The cognitive presence means and standard deviations for the indicators are displayed (see Table 13).

Table 13

Analysis of the Mean and Standard Deviation for Cognitive Presence Factor

Community of Inquiry Statement	*M*	*SD*	*N*
23. Problems posed increased my interest in course issues.	3.65	1.103	62
24. Course activities piqued my curiosity.	3.94	1.054	62
25. I felt motivated to explore content-related questions.	3.98	0.932	62
26. I utilized a variety of information sources to explore problems posed in this course.	4.11	0.870	62
27. Brainstorming and finding relevant information helped me resolve content-related questions.	3.98	0.914	62
28. Online discussions were valuable in helping me appreciate different perspectives.	3.81	1.006	62
29. Combining new information helped me answer questions raised in course activities.	3.98	0.839	62
30. Learning activities helped me construct explanations/solutions.	4.10	0.804	62
31. Reflection on course content and discussions helped me understand fundamental concepts in this class.	3.94	0.973	62
32. I can describe ways to test and apply the knowledge created in this course.	3.89	0.792	62
33. I have developed solutions to course problems that can be applied in practice.	3.82	0.859	62
34. I can apply the knowledge created in this course to my work or other non-class related activities.	4.13	0.819	62

Note. N = 62.

Results. The results indicate the composite mean of 4.01 for the 34 items included in the Community of Inquiry survey postulates an above average overall score.

Based on the composite mean, the health information management online courses provided an overall good satisfaction rating, according to students' perceptions. The composite mean score confirmed the presence of social, teaching, and cognitive elements in the online health information management courses (Arbaugh, 2007).

Summary

The purpose of this research was to investigate whether differences existed in student success and attrition between online and traditional face-to-face health information management programs, as well as to assess the perceived levels of student satisfaction with online health information management courses. The study was conducted online with volunteer participants from CAHIIM accredited health information management two-year associate programs during the spring and fall semesters of 2018. The study was framed by four research questions, which were answered using a quantitative approach.

Through data analysis, a significant difference between the success of student graduates from online health information management programs and face-to-face health information management courses was found for research questions one and two. However, a significant difference was not found between attrition rates between online and face-to-face health information management associate degree programs for research question three. Based on the results of the Community of Inquiry survey used in the fourth and final research question, students perceived having good educational experiences in online health information management courses.

In Chapter Five, a detailed summary and conclusions are provided. Comprehensive findings and conclusions for each research question based on the

quantitative data collected and analyzed in this study are described. Implications for

practice and recommendations for future research on this topic are presented. Finally, a

summary of the chapter and the study is given.

Chapter Five: Summary and Conclusions

The focus of this study was college students and the learning effectiveness of

health information management online programs as compared to traditional face-to-face

programs. The purpose of this study was to determine whether student pass rate scores

on the Registered Health Information Technician exam and seven domain scores of

online students are similar to that of students in traditional face-to-face programs. In

addition, attrition rate differences between online and traditional classroom programs

were examined as well as student perceptions of the online educational experience with

health information management courses.

The findings and conclusions of the study are summarized in this chapter. The

literature reviewed in Chapter Two is examined and connections are made to the findings.

Implications for practice in the area of health information management education and

recommendations for further research are also discussed.

Findings

In this section, the results of the research questions which steered this study are

summarized. A quantitative research method with four research questions was used for

this study (Fraenkel et al., 2015). The quantitative method was chosen to provide

numbers as values which could then be used comparatively (Rahman, 2017). The

research questions were composed to examine quantitative data gathered from multiple

two-year educational institutions (Bluman, 2015). Data were provided by health

information management program directors who volunteered to participate. The

Commission on Accreditation for Health Informatics and Information Management

Education (CAHIIM) (2018) published a data set, which contained de-identified program

data from academic year 2015-16. This data set was used to confirm the calculated

program attrition rate. Data were also collected from currently enrolled online students

of health information management courses utilizing the Community of Inquiry survey

instrument. The perceptions of students currently enrolled in online courses to assess

satisfaction and overall educational experience were represented by this data (Garrison et

al., 2000).

Research question one. *What difference exists, if any, between the national*

Registered Health Information Technician final exam scores from graduates of

traditional face-to-face health information management courses and similar peers

enrolled in online health information management courses? The purpose of this research

question was to conclude if attending an online health information management program

influenced the pass rate for the Registered Health Information Technician national exam

for graduates. This research question was answered by testing the null hypothesis: There

is no difference between the national Registered Health Information Technician final

exam scores from graduates of traditional face-to-face health information management

courses and similar peers enrolled in online health information management courses.

An online survey developed from the self-created data collection tool was used to

collect data from participating health information management program directors to

answer this question. A total of 54 exam scores of graduates of two-year health

information management programs were examined for Research Question One: 28

student exam scores from online programs and 28 student exam scores from traditional

face-to-face programs. To check the data for outliers, the interquartile range (IQR)

method was utilized resulting in two data values of final exam scores lower than IQR

limit of 193.75 being removed from the final exam score data set. Measures of central tendency were calculated with mean scores of 299 for online and 333 for face-to-face programs. A *t*-test, an inferential statistical test for the dissimilarity between two means, produced a *p*-value of .00012 (Bluman, 2015). At $\alpha = .05$ level of significance, it was determined there was a statistically significant difference between the exam score averages of each group; thus, the null hypothesis, there is no difference between the national Registered Health Information Technician final exam scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses, was rejected, and the alternative hypothesis was supported (Bluman, 2015; Fraenkel et al., 2015; Salkind, 2017).

   Research question two. *What difference exists, if any, between the national Registered Health Information Technician domain scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses?* The purpose of this research question was to determine if attending an online health information management program affected graduates' seven domain scores for the Registered Health Information Technician national exam. This research question was answered by testing the null hypothesis: There is no difference between the national Registered Health Information Technician domain scores from graduates of traditional face-to-face health information management courses and similar peers enrolled in online health information management courses.

   A total of 392 scores of the seven domains were examined: scores from 28 online and 28 face-to-face graduates of two-year associate health information management

programs. A *t*-test for comparison of means resulted in p = .0053 (Domain 1), .0002

(Domain 3), .000006 (Domain 5), and .0005 (Domain 6) (Salkind, 2017). At α = .05

level of significance, it was concluded there was a significant difference between the

mean scores of each group for these four domains. However, the *t*-test for differences of

means resulted in p = .1877 (Domain 2), .9285 (Domain 4), and .1280 (Domain 7), which

exceeded α = .05 level of significance; thus, it was concluded there was not a significant

difference between these three domain mean scores of each group (Bluman, 2015;

Fraenkel et al., 2015; Salkind, 2017).

A single factor analysis of variance (ANOVA), one of the most complex

inferential statistical tests, resulted in an *F* test value of 6.513, which was greater than the

1.746 critical value. Thus, the decision was to reject the null hypothesis, and the

alternative hypothesis was supported (Bluman, 2015; Fraenkel et al., 2015). The *p*-value

for ANOVA was .0000, which was less than α = .05. In this case, the null hypothesis,

there is no significant difference between the national Registered Health Information

Technician domain scores from graduates of traditional face-to-face health information

management courses and similar peers enrolled in online health information management

courses, was rejected, and the alternative hypothesis was supported at α =.05 level of

significance (Bluman, 2015).

Research question three. *What difference exists, if any, between health*

information management attrition rates among graduate of traditional face-to-face and

online health information management programs at two-year colleges? The purpose of

this research question was to ascertain if attrition rates differ significantly between online

and face-to-face health information management programs. This research question was

answered by testing the null hypothesis: There is no difference between health information management attrition rates among graduates of traditional face-to-face and online health information management programs at two-year colleges.

Attrition means from a total of five online and four face-to-face health information management programs were examined. A two-tailed *t*-test analysis, an inferential statistical test for means, resulted in $p = .939$ (Bluman, 2015). At $\alpha = .05$ level of significance there was no significant statistical difference between the retention means of the groups; thus, the null hypothesis, there is no difference between health information management attrition rates among graduates of traditional face-to-face and online health information management programs at two-year colleges, was not rejected, and the alternative hypothesis was rejected (Bluman, 2015; Fraenkel et al., 2015; Salkind, 2017).

To further substantiate the support of the null hypothesis, the publicized Annual Program Assessment Report (APAR) data were filtered for two-year associate programs. The attrition rates from 72 online and 62 face-to-face health information management programs were utilized. The health information management two-year attrition rate for students in online programs was 32%, and the rate for similar peer students in face-to-face programs was 31%. A *z*-test for two proportions, two-tailed, produced a *z*-value of 1.689, and with $\alpha = .05$, the critical values were ± 1.960. The null hypothesis was not rejected since the *z*-test value fell in the noncritical region. The *z*-test also produced a *p*-value (two-tailed) of .091 supporting the traditional method analysis (Bluman, 2015; Fraenkel et al., 2015).

Research question four. *What are perceptions, as related to course satisfaction, among students of an online health information management course in a two-year*

associate's program? This research question was designed to gather information on the

perceptions of online educational experiences of student participants in health

information management online courses in two-year associate programs. A total of 62

students of online health information management courses responded to questions

contained in the Community of Inquiry online survey. The majority of students were

within the 33-51 age range (55%), with 92% of the participating population identified as

female gender and 6% identified as male gender.

The Keyser-Meyer-Olkin (KMO) measure of sampling adequacy resulted in 0.80,

indicating a factor analysis would produce well-defined and consistent factors (Swan et

al., 2008). A Principal Components Analysis, a statistical technique used to cluster or

group variables that are related to one another, produced a factor pattern matrix consistent

with the three-factor model of the Community of Inquiry survey instrument (Garrison &

Arbaugh, 2007; Fraenkel, et al., 2015; Salkind, 2017). Based on factor analysis, the

following factors were grouped: questions 1-13 Factor 1 (teaching presence), 14-22

Factor 2 (social presence), and 23-34 Factor 3 (cognitive presence). Cronbach's Alpha, a

test for reliability of internal consistencies, yielded scores for teaching presence = 0.95,

social presence = 0.90, and cognitive presence = 0.94, which are comparable with the

previously produced scores by researchers in the validation of the Community of Inquiry

instrument (Arbaugh et al., 2008, p. 135; Swan, et al., 2008, p. 6).

Descriptive statistics resulted in a composite mean score of 4.14 (*SD* = 0.94) for

Factor 1 (teaching presence) reflecting an above average degree (*strongly agree/agree)* of

student satisfaction. A majority of students (55%) responded *strongly agree* with the

statement, *The instructor clearly communicated important course goals,* demonstrating

agreement with good communication by the instructor. A composite mean score of 3.90

(*SD* = 0.98) for Factor 2 (social presence) reflected a lower level (*agree/neutral)* of

student satisfaction. With the lowest scoring mean of 3.61, 13% of students *disagree* and

5% *strongly disagree* with the statement, *Online discussions helped me to develop a*

sense of collaboration. Factor 3 (cognitive presence) yielded a composite mean score of

3.94 (*SD* = 0.91) reflecting a slightly higher degree (*agree*) of student satisfaction.

However, there was a 31% *neutral* response by students to the statement, *Problems posed*

increased my interest in course issues, and 10% of students reported *disagree* with the

statement, *Online discussions were valuable in helping me appreciate different*

perspectives. A test for the composite mean of the 34 items of the Community of Inquiry

survey resulted in 4.01, representing student perception of a good educational experience

and good satisfaction with the current online health information management courses.

Conclusions

The purpose of the study was to examine if differences exist in student success

and attrition rates by comparing data from traditional face-to-face health information

management programs with similar online programs. Student perceptions of satisfaction

with current online health information management courses were also examined. The

conclusions of this research study addressed by each research question are discussed in

the following section.

Research question one. *What difference exists, if any, between the national*

Registered Health Information Technician final exam scores from graduates of

traditional face-to-face health information management courses and similar peers

enrolled in online health information management courses? An important conclusion

from the analysis of data gathered in conjunction with research question one was

graduates of online health information management programs received on the average a

lower total score on the national Registered Health Information Technician exam than did

their counterparts graduating from traditional face-to-face health information

management programs. From this information, it is concluded that the upsurge in the

growth of online health information management programs has resulted in a decrease in

the pass rate for first time test-takers as reported by the American Health Information

Management Association (AHIMA, 2016; C. Dixon-Lee, personal communication, July

28, 2016). As health information management educators and administrators review

online programs, it is important to note successful student outcomes are what drive the

reputation for quality of online education (Bunk et al., 2015).

Online education growth continues with an estimated 5.2 million undergraduate

students participating in online education and 2.2 million students participating in online

education exclusively in the fall 2016 semester (McFarland et al., 2018, p. 163). Almost

60% of online students chose online learning as their preferred format compared to on-

ground learning courses (Magda & Aslanian, 2018, p. 8). Consequently, as the growth

and demand for online education continues, so too do the challenges for institutions and

educators to support and provide high quality educational experiences (Southard &

Mooney, 2015).

Research question two. *What difference exists, if any, between the national*

Registered Health Information Technician domain scores from graduates of traditional

face-to-face health information management courses and similar peers enrolled in online

health information management courses? An interesting finding from analysis of the

collected data used to examine the second research question in this study was there was a significant difference between the seven domain scores by graduates of online health information management programs as compared to that of face-to-face program graduates. The means of the seven domains resulted in a lower average for the online graduates than the traditional face-to-face graduates. Specifically, the domain score for Quality (Domain 5) had the lowest mean (50) for online graduates, suggesting online courses were not as robust or possibly failed to include curricular competencies needed or expected as compared to the traditional face-to-face classroom. Whereas, the mean domain score for Information Technology (Domain 4) was the same for online and face-to-face program graduates; however, it was the lowest mean domain score for the traditional face-to-face graduates. This may suggest that the use of technology in the online programs provided more applied learning than did the face-to-face programs.

Student learning is influenced by the quality of the online instruction, especially in the arena of cognitive and higher order learning, making careful planning and design of online courses in alignment with educational theories important (Sun & Chen, 2016). Online education should not substitute teachers with technology but rather enhance the teachers as mediators who are engaging and relating with students by providing support and motivation (Serdyukov, 2015). Students who lack motivation are predisposed to achieve low academic success in higher education (Sogunro, 2015).

Research question three. *What difference exists, if any, between health information management attrition rates among graduates of traditional face-to-face and online health information management programs at two-year colleges?* The most important conclusion from data analysis for research question three was that regardless of

the program format, the attrition rates indicated no significant difference existed between online and face-to-face health information management programs. Online programs in examined in this study had an average attrition rate of 32% (retention rate 68%), compared to 31% (retention rate 69%) for face-to-face programs, indicating no significant difference due to program delivery method. This finding aligned well with currently provided retention rate information (McFarland et al., 2018). The U.S. Department of Education, National Center for Education Statistics, reported retention data for 2-year public institutions, which showed an overall 62% retention rate for first-time undergraduates in spring 2016 (McFarland et al., 2018, p. 201). In addition, reported online programs retention rate in traditional public universities was 68.2%, and lack of quality education and support from faculty and advisors were listed as reasons students dropped out of online programs (Sorensen & Donovan, 2017, p. 206).

Research question four. *What are perceptions, as related to course satisfaction, among students of an online health information management course in a two-year associate's program?* Data were collected utilizing the Community of Inquiry survey instrument using a Likert-type scale to capture quantitative data. An important and valuable conclusion from data collected and analyzed was student satisfaction ratings showed an overall above average level of student satisfaction with current online health information management courses. In addition, it was concluded that health information management educators were successful in creating a shared learning environment with cognitive, social, and teacher presences as part of their courses (Arbaugh, 2007).

Previous research has directly associated the engagement of the online student with student outcomes, making student engagement a topic that should be considered for

professional development offered to online teachers (Ali & Smith, 2015; Richardson et al., 2015; Tinto, 2012; Zweig & Stafford, 2016). Because the majority of adult learners are self-directed and goal-oriented, it is important that teachers frame learning strategies to allow adult learners to see the purpose of the assignment and to incorporate the success of students' life experiences with new material presented in the course (Bigatel & Edel-Malizia, 2018). Engaging students meaningfully with subject matter relies on the teacher to facilitate by monitoring and guiding learners' thinking and is vital for a successful online learning environment (Dolan et al., 2017).

Implications for Practice

The implications of this study are focused on the excellence of online education as assessed by student academic success and retention or motivation. Online programs with a strong overlapping and intermingling of cognitive presence, social presence, and teaching presence promote higher student satisfaction which is an indication of quality in online education (Akyol & Garrison, 2008; Arbaugh, 2007; Online Learning Consortium, 2017). Thus, to address issues of student academic success and retention, both of which are a reflection of quality education, the three components of the Community of Inquiry theory were used to frame and present the implications.

Assurance of quality. Higher education accrediting agencies rely on institutional standards and policies to assess the quality of current online courses and programs (Rucker et al., 2015). Martin et al. (2017) examined and analyzed standards from 12 publications and found that the top ranked standards fell into the instructional analysis, design, and development categories. Whereas, faculty support and satisfaction along with planning and policies were the least noted standards (Martin, et al., 2017).

However, high-quality instruction and effective learning outcomes have been linked to student engagement with course content, peers, and instructors (Martin & Bolliger, 2018). Students' emotional engagement are demonstrated by how expectations are managed, being able to recognize motivation, expressing value of learning and acquiring knowledge, and being committed to the online learning process (Redmond et al., 2018). The engagement of students in an online course is an indicator of the quality of the design and delivery methods (Bigatel & Edel-Malizia, 2018b).

Good online instructors are knowledgeable and skilled in the use of technology and available online at all times, frequently checking emails and responding to student questions and concerns (Sun & Chen, 2016). Posting and sending regular announcements or email reminders to online students was rated as very important for student engagement in the online learning environment (Martin & Bolliger, 2018). Students' perceived satisfaction and effective learning outcomes are greatly influenced by a well-designed online course, with consistent course activities and structure, as well as having assignment due dates established; however, required online discussions with peers or instructors do not (Cho & Tobias, 2016). Online discussions when utilized, should contain questions or prompts which cause students to cultivate a deeper appreciation of the content, and guidance by the instructor adds to the quality of the discussion enabling students to also develop cognitive skills (Martin & Bolliger, 2018). Values relevant to online education are effectiveness of online education through quality of both learning and instructing, learner enablement through active involvement, and academic integrity through ethical behavior and accountability by faculty and learner alike (Singh & Hurley, 2017).

Cognitive presence. Constructing meaningful dialogue between teachers and students allows students to construct meaning from their experiences built upon Dewey's model of critical thinking (Garrison et al., 2001). Dewey's practical inquiry model contributed to the definition of cognitive presence (Arbaugh, 2007). The practical inquiry model begins when students are presented with a problem, the students pause and reflect, then move to exploring and searching for explanations, combine what they have learned to construct meaning, and finally conclude a possible solution to the presented problem (Garrison et al., 2000; Swan et al., 2008).

Relevance and the perceived value of the learning experience are important to students and affects students' willingness to engage in the online environment (Franklin, 2017). Students are creators of their own learning, especially in an online course, regardless of the instructional strategies employed by the teacher (Watson et al., 2017). Having a focus on a disciplinary area of specific interest, application of learning to a career, and being advanced in the level of education were found to contribute to student success (Gering et al., 2018). Therefore, it is important for educators to provide problem-solving and real-world activities that challenge students with higher learning thinking in an applied learning environment. In other words, assignments must be meaningful and applicable to the subject matter and the students.

Social presence. Social presence was described as an essential element of the Community of Inquiry framework (Garrison et al., 2000). A predictor of student learning and satisfaction is the quality of student-faculty interaction, and student-student interaction has been determined to be a predictor of learning (Selhorst et al., 2017). Fifty-seven percent of online students related that connections and associations with

classmates are very important to their academic success, making it important that online courses offer opportunities to promote interactions between peers (Magda & Aslanian, 2018, p. 40). Course activities that are related to personal experiences assist students to develop associations with one another and the instructor and build a sense of community within the course (Tinto, 1997). Once again, the use of real-world activities in an online course enables adult learners to interact with one another and the instructor and promotes engagement (Britt, 2015).

The achievement of social presence in an online course is key and must be instituted as part of the online learning environment (Hajibayova, 2017). Timely, practical and significant interaction between faculty and students delivers the highest level of student satisfaction with online courses (Watson et al., 2017). Lack of self-reliant study skills, lack of technological support, and uneasiness with the lack of visualization of the instructor contribute to the impairment of the quality of online learning (Hajibayova, 2017). Better outcomes for students can be obtained through instructor engagement and accessibility by building rapport with students in online courses (Glazier, 2016). The primary function of social presence is to maintain relationships with meaningful and substantial communication, as well as create a sense of community within the online course (Kozan, 2016). To address attrition and retention in health information management programs, faculty as well as college personnel must construct a sense of community with the adult online students by engaging early and routinely in the course through communication and association.

Teaching presence. Teaching presence is experienced in online courses by the facilitation, guidance, and moderating of the learning activities and environment

(Garrison et al., 2000). The principal means of contact in an online course occurs with discussion activities within the learning management system (Vincent et al., 2016). In a recent study, students preferred interaction and discussion with peers and less direct interaction with professors, and larger discussion groups allowed more anonymity for students who were uncomfortable participating in discussion forums (Selhorst et al., 2017). However, 14% of online students found discussion boards not helpful, and 17% reported that synchronous sessions such as Zoom meetings, were not used or preferred (Magda & Aslanian, 2018, p. 41). The teaching presence was also a reflection of how the course was designed and organized with regard to presentation of course content, learning activities, and assessments (Hajibayova, 2017).

Teachers participate in engagement with students by using multiple and varied representations of the subject matter to be learned, supporting an interactive online learning environment (Glenn, 2016). To develop a teaching presence in online courses, consider employing student-centered collaborative learning through the use of case studies, role-playing, policy debates, interactive technology, and team discussions. Also, it is important to be consistent in the design of online courses and to make activities interactive requiring more than PowerPoint presentations, recorded lectures, and quizzes.

Recommendations for Future Research

There is opportunity for future research studies in the area of academic success and retention in the health information management discipline due to a void of education literature in this regard (D. Mancilla, personal communication, September 19, 2017). Similar to recommendations of other researchers, a larger population of participants is recommended for future research (Creswell & Creswell, 2018; Fraenkel et al., 2015;

Bluman, 2015). Further studies could be broadened in scope to include health

information management bachelor programs in a similar research study utilizing the

results and findings to make comparison to that of the associate program study. Future

research with a long-term study to better understand the benefits of social, teaching, and

cognitive presence in online courses, and the possibility for improvement of retention and

completion rates in health information management degrees, would be beneficial.

Focus groups could be utilized in similar research of online courses to better

understand student perceptions of satisfaction with online courses by gathering input as to

what makes online courses engaging both socially and cognitively. An in-depth study of

student learning styles and how health information management education can adapt to

the learning styles of adult students would be of interest. Educators need to increase their

skills and knowledge to better understand student development, curriculum, and applied

learning in an interactive environment (Sun & Chen, 2016). Future research on

professional development for online educators would be beneficial utilizing a mixed

method approach to improve the quality of online education. Standards for assessing the

quality of online programs varies between institutions, and research to develop a

standardized method used to produce a numeric score to quantify the elements of quality

in online education is needed (Rucker et al., 2015).

Summary

This quantitative study was intended to examine if there were differences in

student academic success and attrition rates between online and traditional face-to-face

health information management two-year programs. In addition, student perceptions of

satisfaction with current online health information management courses were guided by

the Community of Inquiry theory for identifying a good online educational experience

(Garrison et al., 2000). As there continues to be growth in the demand for online

programs, educators must keep current with the latest methods to enrich student

educational experiences (Britt, 2015).

In Chapter One, the decreasing federal and state funding for higher education

along with performance-based funding forcing colleges to become more responsible and

accountable for student retention and completion rates were discussed (Hillman, 2016;

Juzkiewicz, 2016). The background of the study was determined, and the problem and

purpose of the study were outlined. The focus of the study, which included student

academic success measured by national exam results, the attrition rates of the programs,

and the overall experiences of students in current online health information management

courses, was shared. The Community of Inquiry theory outlining the elements or factors

needed for a good educational experience was introduced as the appropriate framework

for the study (Garrison et al., 2000).

In Chapter Two, a literature review pertinent to the Community of Inquiry

framework, which outlined elements required to create a good shared online learning

experience, was presented (Garrison, 2008). Literature reviewed supported the theory

that social, cognitive, and teaching presences in an online course impact the success and

retention of students (Martin & Bollinger, 2018; Richardson et al., 2015; Tinto, 2012).

The increase in demand for online education offerings and the growth of the non-

traditional student population has raised concerns about the quality of online education in

comparison to traditional campus-based courses (Flynn, 2016; Grossman & Johnson,

2015). In addition, the growth of non-traditional adult students has postulated a need to

review adult learning theories, specifically concerning barriers to learning with the use of technology (Loizzo et al., 2017; Vai & Sosulski, 2016).

The methodology of this study was presented in Chapter Three. A quantitative approach was chosen to examine the research questions guiding this study. Quantitative research is systematic using numbers and numerical relationships allowing for analyzing data to test theories and draw conclusions from the findings (Bluman, 2015; Rahman, 2016). Three of the research questions were focused on the differences between online and face-to-face programs with regard to student academic success and attrition rates. Students of online health information management courses participated in the Community of Inquiry survey, which provided the data to answer research question four. The survey was used to identify how students perceive the presences of cognitive, social and teaching in health information management online courses (Garrison et al., 2000).

The results of research questions one and two were found to be statistically significant for this study. It is apparent from the findings that online education success differs significantly from traditional face-to-face education. However, the attrition rates remain nearly identical, as well as the retention rates for online and face-to-face programs. The findings of student perceptions, however, were encouraging for the advancement of online education in that the current online courses provide a good and satisfactory educational experience to students.

Finally, in Chapter Five, the findings of the research questions were discussed, with conclusions framed and compared with literature reviewed in Chapter Two. Student engagement with the instructor and with peers was identified as a predictor of student learning, as well as motivation to complete (Ali & Smith, 2015; Richardson et al., 2015;

Tinto, 2012). Based on the findings of research questions one and two, there was a significant difference between the final exam scores for the Registered Health Information Technician national exam for graduates of traditional face-to-face and online accredited health information management programs. Online graduates scored lower on the exam than their peers of similar face-to-face programs. During the same academic year, there was also a decrease in the overall national pass rate for the Registered Health Information Technician exam as the number of accredited of online health information management programs increased. However, there were positive responses from students regarding the quality of health information management online courses, as discovered from the results of research question four. A need for continued professional development of educators to be prepared in the implementation of innovation and technology for student success in online education was identified from the literature review for this study (Zweig & Stafford, 2016). Advances in technology and innovation have been identified as a force for change in education, and those who fail to embrace the rapidly advancing technology may become stagnant or deteriorate and ultimately fail (Mitchell et al., 2015).

Appendix A

RE: Permission to Use CoI Model from WebsiteDG

D. Randy Garrison < ██████████████ >

Reply all|
Wed 12/5/2018, 2:28 PM
FOSTER, SUSAN L (Student);
Dan Wilton < ██████████████ >
Inbox

Susan,
You have my permission to use the Community of Inquiry Model that is available on the Community of Inquiry website.
With regard to joining the CoI website I have copied this to Dan who should be able to facilitate this.
Best wishes,
DRG

D. Randy Garrison
Professor Emeritus
University of Calgary

Email: ██████████████
CoI Website: https://coi.athabascau.ca/
BLOG: http://www.thecommunityofinquiry.org/community

From: FOSTER, SUSAN L (Student) [mailto: ██████████████]
Sent: Tuesday, December 04, 2018 7:22 PM
To: D. Randy Garrison
Subject: Permission to Use CoI Model from Website

Dr. Garrison,

I am writing you to request permission to use the Community of Inquiry Model that is made available on the Community of Inquiry website to be used in my soon to be published dissertation. I will, of course, cite my source.

I would also like to be a member of CoI website if possible.

Thank you and I look forward to hearing from you!

Warm regards,
Susan
Susan L Foster, MBA, RHIA, CHPS
Doctoral Student
Lindenwood University
██████████████

Appendix B

Self-Created Data Collection Tool

Data Collection Instrument on CAHIIM Accredited Associate Programs for Doctoral Dissertation Research Study

Definitions: Online (OL) Program - All Health Information Management courses are offered online via computer. Campus-Based (CB) Program - All Health Information Management courses are offered face-to-face. Hybrid (H) Program - All Health Information Management courses are offered face-to-face. Hybrid (H) Program - Health Information Management courses are offered both online and face-to-face.

Program Data	2015-2016 Program Annual Attrition Rate	Online (OL) /Campus-Based(CB) /Hybrid(H) Program
Example	10.0%	OL
1		

This information can be found on your Annual Program Assessment Report (APAR). Please enter your program attrition rate in the Program Data section, attrition rate column. Using the abbreviation that defines your program, please indicate if your health information management courses are offered online, face-to-face, or a combination of online and face-to-face.

STUDENT	First-Time Test Taker Y/N	SCALE SCORE	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Domain 7
Example	Y	351	81	58	95	67	71	92	71
A									
B									
C									
D									
E									
F									
G									
H									
I									
J									
K									
L									
M									
N									
O									
P									
Q									
R									
S									
T									
U									
V									
W									
X									
Y									
Z									

This information is found on the AHIMA Registered Health Information Technician (RHIT) Roster Report (7/1/2015 - 6/30/2016) for your program. Use as many lines as needed to report on your program test-takers.

Appendix C

Permission to Use Community of Inquiry Instrument

September 14, 2016

Dr. Garrison,

I would like your permission to use the Community of Inquiry Survey Instrument 14b for my dissertation as a student at Lindenwood University School of Education.

The study will examine health information technology students' perceptions of the three presences of "cognitive, social, and teaching," as well as satisfaction in their online courses.

The proposed sample will be those students who are enrolled in a two-year associate health information technology program making them eligible upon completion to take the Registered Health Information Technician certification exam.

I would like to use all 34 questions. In addition, I will be collecting demographic data.

Thank you for your consideration.

Warm regards,

Susan L Foster

D. Randy Garrison to you
Sep 18, 2016
Susan,
You have my permission to use the Community of Inquiry Survey Instrument for your dissertation.
Best wishes,
DRG

Appendix D

Community of Inquiry Survey

Your responses to the statements on this survey should be based on your perceptions of

online Health Information Management courses in your current program. Please indicate

your agreement with each of the following statements:

#	Statement	Agreement 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree				
1	The instructor clearly communicated important course topics.	1	2	3	4	5
2	The instructor clearly communicated important course goals.	1	2	3	4	5
3	The instructor provided clear instructions on how to participate in course learning activities.	1	2	3	4	5
4	The instructor clearly communicated important due dates/time frames for learning activities.	1	2	3	4	5
5	The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	1	2	3	4	5
6	The instructor was helpful in guiding the class toward understanding course topics in a way that helped me clarify my thinking.	1	2	3	4	5
7	The instructor helped to keep course participants engaged and participating in productive dialogue.	1	2	3	4	5
8	The instructor helped keep the course participants on-task in a way that helped me to learn.	1	2	3	4	5
9	The instructor encouraged course participants to explore new concepts in this course.	1	2	3	4	5
10	Instructor actions reinforced the development of a sense of community among course participants.	1	2	3	4	5
11	The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	1	2	3	4	5
12	The instructor provided feedback that helped me understand my strengths and weaknesses.	1	2	3	4	5
13	The instructor provided feedback in a timely fashion.	1	2	3	4	5
14	Getting to know other course participants gave me a sense of belonging in the course.	1	2	3	4	5
15	I was able to form distinct impressions of some course participants.	1	2	3	4	5

16	Online or web-based communication is an excellent medium for social interaction.	**1**	**2**	**3**	**4**	**5**
17	I felt comfortable conversing through the online medium.	**1**	**2**	**3**	**4**	**5**
18	I felt comfortable participating in the course discussions.	**1**	**2**	**3**	**4**	**5**
19	I felt comfortable interacting with other course participants.	**1**	**2**	**3**	**4**	**5**
20	I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	**1**	**2**	**3**	**4**	**5**
21	I felt that my point of view was acknowledged by other course participants.	**1**	**2**	**3**	**4**	**5**
22	Online discussions helped me to develop a sense of collaboration.	**1**	**2**	**3**	**4**	**5**
23	Problems posed increased my interest in course issues.	**1**	**2**	**3**	**4**	**5**
24	Course activities piqued my curiosity.	**1**	**2**	**3**	**4**	**5**
25	I felt motivated to explore content-related questions.	**1**	**2**	**3**	**4**	**5**
26	I utilized a variety of information sources to explore problems posed in this course.	**1**	**2**	**3**	**4**	**5**
27	Brainstorming and finding relevant information helped me resolve content-related questions.	**1**	**2**	**3**	**4**	**5**
28	Online discussions were valuable in helping me appreciate different perspectives.	**1**	**2**	**3**	**4**	**5**
29	Combining new information helped me answer questions raised in course activities.	**1**	**2**	**3**	**4**	**5**
30	Learning activities helped me construct explanations/solutions.	**1**	**2**	**3**	**4**	**5**
31	Reflection on course content and discussions helped me understand fundamental concepts in this class.	**1**	**2**	**3**	**4**	**5**
32	I can describe ways to test and apply the knowledge created in this course.	**1**	**2**	**3**	**4**	**5**
33	I have developed solutions to course problems that can be applied in practice.	**1**	**2**	**3**	**4**	**5**
34	I can apply the knowledge created in this course to my work or other non-class related activities.	**1**	**2**	**3**	**4**	**5**

Gender (select one)   Male   Female

Specify full- or part-time student in this program (select one)   FT   PT

Number of online courses completed in this program to date:			
Age range (select one) 18-32 33-51 52-70 71+			
Do you work while in school? (select one) Yes No			
If you work, do you work in healthcare? (select one) Yes No			
If you work, how many hours a week do you work? (Select one) 10-20 21-30 31-40 40+			

Appendix E

LINDENWOOD

LINDENWOOD UNIVERSITY ST. CHARLES, MISSOURI

DATE: March 6, 2018

TO: Susan Foster, MBA, BS
FROM: Lindenwood University Institutional Review Board

STUDY TITLE: [929394-1] A Comparison of Student Success, Attrition, and
                               Perceptions of Online Course Satisfaction in Online with Face-to-
                               Face Health Information Management Associate Degree Programs
IRB REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: March 6, 2018

REVIEW CATEGORY: Exemption category # *1*

Thank you for your submission of New Project materials for this research study.
Lindenwood University Institutional Review Board has determined this project is
EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office.

If you have any questions, please send them to IRB@lindenwood.edu. Please include
your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations,
and a copy is retained within Lindenwood University Institutional Review Board's
records

Appendix F

RE: Permission to Conduct Research at {college}
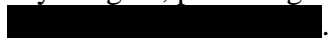
Dear {name},

I am writing to request permission to conduct research at {college}. I am currently pursuing my doctorate through Lindenwood University and in the process of writing my dissertation. The study is entitled, "A Comparison of Student Success, Attrition, and Perceptions of Course Satisfaction in Online Courses with Face-to-Face Health Information Management Associate Degree Programs."

I am asking permission for your health information management program directors to provide deidentified scale score and domain score results on graduates of your program who have taken the Registered Health Information Technician credentialing exam during the academic year of 2015-2016.

I also ask permission to allow your program directors to provide the attrition rate of the program for the academic year of 2015-2016, as well as if the program was presented in online format or traditional face-to-face courses. Neither the name of the institution nor any names of students will be collected.

To gather opinions from online students, I ask permission for the program directors to forward emails to their students of online courses, which will include information as well as a link to an online survey. Information collected is deidentified. No student name or institution name will be collected.

If you agree, please sign below, scan this letter, and email back to me, Susan Foster, at ██████████████████.

Your approval to conduct this study will be greatly appreciated. I would be happy to answer any questions or concerns that you may have regarding this study.

Sincerely,

Susan L Foster
Doctoral Student at Lindenwood University

Approved by:

_____   _____   _____

Print name and title   Signature   Date

Appendix G

Request to Participate eMail Letter to Program Directors

Dear Program Director,

You are invited to participate in a research study conducted by Susan L. Foster, who is a doctoral student at Lindenwood University. You were chosen to participate in this study because you are director of a health information management associate degree program.

The focus of this study is on college students and their learning outcomes with health information management programs in an online learning environment, as compared with that of a traditional face-to-face learning environment. The study objective is to determine whether student scale scores of the Registered Health Information Technician national certification exam and seven domain scores of distance education students are similar to those of students in traditional classroom programs. Student attrition rates of online programs compared to that of traditional face-to-face programs will also be examined in this study. Student persistence and attrition rates in courses and program completion are often used to measure student outcomes.

The data to support the proposed research study will be RHIT exam scale and domain scores of each student who took the test from your program during the 2015-2016 academic year, the attrition rate for the same time period, and whether or not your program is online, on-campus, or hybrid-based. Completion of the survey will involve approximately 15-20 minutes of time depending upon the amount of data you provide. Please click the link below to go to the survey website (or copy and paste the link into your Internet browser).

Survey link: http://www.xxxxxxxxx/
Personal Access Code: XXXXXX

Your participation in the survey is completely voluntary, and all of your responses will be kept confidential and anonymous. You may decline to participate without any negative consequences. Your name will not appear in the dissertation or any published articles as participating in this study unless you authorize the investigator to do so. I would like to assure you that this research study has been reviewed thoroughly and approved by the Institutional Review Board at Lindenwood University.

I would also like to ask that you forward the attached Request to Participate letter with a link to a survey to your online students. This survey will be used to collect data on students' perceptions of satisfaction with online HIM courses.

It is my hope the results of this study will be of benefit to all health information management educators as well as students of all health information management educational programs. Thank you very much for your time and participation. Your data are very important to this research study.

Kind regards,

Susan L Foster
Doctoral Student
Lindenwood University

Appendix H

LINDENWOOD

Survey Research Information Sheet

You are being asked to participate in a survey conducted by Susan L. Foster under the guidance of Dr. Kathy Grover at Lindenwood University. We are doing this study to identify if there are significant differences in student outcomes as well as the perceived overall student satisfaction with health information management programs presented online at two-year institutions of higher learning in the United States when compared to traditional face-to-face programs. The **program director survey** is designed to collect deidentified scale and domain scores for the RHIT exam and attrition rates of traditional and online program students. The results will provide us with the information to address the Community of Inquiry model as the appropriate theory to be used in teaching online health information management courses. Potential advantages include providing information that will aid in examination of our current online program quality to better guide health information management educators in the future. There are no disadvantages to participating in this research opportunity. It will take about 15-20 minutes to complete this survey.

Your participation is voluntary. You may choose not to participate or withdraw at any time by simply not completing the survey or closing the browser window.

There are no risks from participating in this project. We will not collect any information that may identify you. There are no direct benefits for you participating in this study.

WHO CAN I CONTACT WITH QUESTIONS?

If you have concerns or complaints about this project, please use the following contact information:

Researcher: Susan L. Foster   Email Address: ▮▮▮▮▮▮▮▮▮▮▮▮

Instructor: Dr. Kathy Grover   Email Address: kgrover@lindenwood.edu

If you have questions about your rights as a participant or concerns about the project and wish to talk to someone outside the research team, you can contact Michael Leary (Director - Institutional Review Board) at 636-949-4730 or mleary@lindenwood.edu.

By clicking the link below, I confirm I have read this form and have decided I will participate in the project described above. I understand the purpose of the study, what I will be required to do, and the risks involved. I understand I can discontinue participation at any time by closing the survey browser. My consent also indicates I am at least 18 years of age.

You can withdraw from this study at any time by simply closing the browser window. Please feel free to print a copy of this information sheet.

Appendix I

Introductory Letter and Request to Participate for HIM Students

Date: *day, month day, year time*

To: Health Information Management Students

Subject: Survey of Students Who Are Taking an Online Health Information Management Course

Dear HIM Student,

I am writing to you today as a request for your participation in an important survey. As the offering of health information management programs and courses in the online format increases, it is important our educators have a good understanding of how their courses are perceived by students. Your responses to this survey will assist us in evaluating the effectiveness of health information management online courses so that we can better design courses and improve education.

The survey consists of 34 questions with an additional seven demographic questions and should take approximately 20 minutes to complete. Please click the link below to go to the survey website (or copy and paste the link into your Internet browser) and then enter the personal code to begin the survey.

Survey link: http://www.xxxxxxxxx/
Personal Access Code: XXXXXX

Your participation in the survey is completely voluntary and all of your responses will be kept confidential and anonymous. The access code is to prevent duplicate participation, and once used, the access code is removed from the survey. No personally identifiable information will be associated with your responses to any reports of these data. The Lindenwood University Institutional Review Board has approved this survey. Should you have any comments or questions, please feel free to contact me at
▮▮▮▮▮▮▮▮▮▮▮▮▮ or ▮▮▮▮▮▮▮▮.

Thank you very much for your time and participation. Feedback from students is very important to this research study.

Sincerely,

Susan L Foster
Doctorate Student
Lindenwood University

Appendix J

LINDENWOOD

Survey Research Information Sheet

You are being asked to participate in a survey conducted by Susan L. Foster under the guidance of Dr. Kathy Grover at Lindenwood University. We are doing this study to identify if there are significant differences in student outcomes as well as the perceived overall student satisfaction with health information management programs presented online at two-year institutions of higher learning in the United States when compared to traditional face-to-face programs. The **student survey** addresses student satisfaction with the online program. The results will provide us with the information to address the Community of Inquiry model as the appropriate theory to be used in teaching online health information management courses. Potential advantages include providing information that will aid in examination of our current online program quality to better guide health information management educators in the future. There are no disadvantages to participating in this research opportunity. It will take about 15-20 minutes to complete this survey.

Your participation is voluntary. You may choose not to participate or withdraw at any time by simply not completing the survey or closing the browser window.

There are no risks from participating in this project. We will not collect any information that may identify you. There are no direct benefits for you participating in this study.

WHO CAN I CONTACT WITH QUESTIONS?

If you have concerns or complaints about this project, please use the following contact information:

Researcher: Susan L. Foster   Email Address: ▮▮▮▮▮▮▮▮▮▮

Instructor: Dr. Kathy Grover   Email Address: kgrover@lindenwood.edu

If you have questions about your rights as a participant or concerns about the project and wish to talk to someone outside the research team, you can contact Michael Leary (Director - Institutional Review Board) at 636-949-4730 or mleary@lindenwood.edu.

By clicking the link below, I confirm I have read this form and have decided I will participate in the project described above. I understand the purpose of the study, what I will be required to do, and the risks involved. I understand I can discontinue participation at any time by closing the survey browser. My consent also indicates I am at least 18 years of age.

You can withdraw from this study at any time by simply closing the browser window. Please feel free to print a copy of this information sheet.

Appendix K

Summary of Community of Inquiry Survey Factor Pattern Matrix

Community of Inquiry Statement	Factor		
	1	2	3
1. The instructor clearly communicated important course topics.	**0.817**	0.096	0.337
2. The instructor clearly communicated important course goals.	**0.792**	0.016	0.388
3. The instructor provided clear instructions on how to participate in course learning activities.	**0.677**	0.228	-0.225
4. The instructor clearly communicated important due dates/time frames for learning activities.	**0.652**	0.137	0.390
5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	**0.845**	0.041	0.215
6. The instructor was helpful in guiding the class toward understanding course topics in a way that helped me clarify my thinking.	**0.850**	0.129	0.292
7. The instructor helped to keep course participants engaged and participating in productive dialogue.	**0.877**	0.170	0.072
8. The instructor helped keep the course participants on-task in a way that helped me to learn.	**0.850**	0.069	0.316
9. The instructor encouraged course participants to explore new concepts in this course.	**0.695**	0.032	0.523
10. Instructor actions reinforced the development of a sense of community among course participants.	**0.673**	0.214	0.330
11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	**0.591**	0.198	0.487
12. The instructor provided feedback that helped me understand my strengths and weaknesses.	**0.832**	0.138	0.135

Community of Inquiry Statement	Factor		
	1	2	3
13. The instructor provided feedback in a timely fashion.	**0.629**	0.189	0.259
14. Getting to know other course participants gave me a sense of belonging in the course.	0.418	**0.616**	0.234
15. I was able to form distinct impressions of some course participants.	0.352	**0.448**	0.399
16. Online or web-based communication is an excellent medium for social interaction.	0.078	**0.537**	0.227
17. I felt comfortable conversing through the online medium.	0.102	**0.743**	0.142
18. I felt comfortable participating in the course discussions.	0.096	**0.840**	0.102
19. I felt comfortable interacting with other course participants.	0.116	**0.865**	0.089
20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	0.031	**0.836**	0.130
21. I felt that my point of view was acknowledged by other course participants.	0.065	**0.814**	0.219
22. Online discussions helped me to develop a sense of collaboration.	0.184	**0.625**	0.489
23. Problems posed increased my interest in course issues.	-0.012	0.347	**0.810**
24. Course activities piqued my curiosity.	0.279	0.285	**0.712**
25. I felt motivated to explore content-related questions.	0.288	0.205	**0.725**
26. I utilized a variety of information sources to explore problems posed in this course.	0.180	0.144	**0.725**

Community of Inquiry Statement	Factor		
	1	2	3
27. Brainstorming and finding relevant information helped me resolve content-related questions.	0.427	0.369	**0.611**
28. Online discussions were valuable in helping me appreciate different perspectives.	0.260	**0.590**	0.393
29. Combining new information helped me answer questions raised in course activities.	0.457	0.370	**0.581**
30. Learning activities helped me construct explanations/solutions.	0.460	0.224	**0.653**
31. Reflection on course content and discussions helped me understand fundamental concepts in this class.	0.472	0.446	**0.529**
32. I can describe ways to test and apply the knowledge created in this course.	0.443	0.209	**0.585**
33. I have developed solutions to course problems that can be applied in practice.	0.231	0.142	**0.771**
34. I can apply the knowledge created in this course to my work or other non-class related activities.	0.511	0.272	**0.497**

Note. Rotation method: Varimax with Kaiser normalization. Survey items that loaded on a component at .5 or higher are in bold.

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