

Georgia State University
ScholarWorks @ Georgia State University

Learning Technologies Division Dissertations

Department of Learning Sciences

12-21-2018

An Examination of Pre-major Health Student's Readiness for Interprofessional Education at a Technical College

Ryan G. Cheek
Georgia State University

Follow this and additional works at: https://scholarworks.gsu.edu/ltd_diss

Recommended Citation

Cheek, Ryan G., "An Examination of Pre-major Health Student's Readiness for Interprofessional Education at a Technical College." Dissertation, Georgia State University, 2018.
https://scholarworks.gsu.edu/ltd_diss/6

This Dissertation is brought to you for free and open access by the Department of Learning Sciences at ScholarWorks @ Georgia State University. It has been accepted for inclusion in Learning Technologies Division Dissertations by an authorized administrator of ScholarWorks @ Georgia State University. For more information, please contact scholarworks@gsu.edu.

ACCEPTANCE

This dissertation, AN EXAMINATION OF PRE-MAJOR HEALTH STUDENT'S READINESS FOR INTERPROFESSIONAL EDUCATION AT A TECHNICAL COLLEGE, by RYAN CHEEK, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education & Human Development, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chairperson, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty.

Brendan Calandra, Ph.D.
Committee Chair

Raymond Mooring, Ph.D.
Committee Member

Lynda Goodfellow, Ed.D.
Committee Member

Date

Lauren Margulieux, Ph.D.
Committee Member

Janet Burns, Ph.D.
Committee Member

Brendan Calandra, Ph.D.
Chairperson, Department of Learning
Sciences

Paul A. Alberto, Ph.D.
Dean, College of Education &
Human Development

AUTHOR'S STATEMENT

By presenting this dissertation as a partial fulfillment of the requirements for the advanced degree from Georgia State University, I agree that the library of Georgia State University shall make it available for inspection and circulation in accordance with its regulations governing materials of this type. I agree that permission to quote, to copy from, or to publish this dissertation may be granted by the professor under whose direction it was written, by the College of Education & Human Development's Director of Graduate Studies, or by me. Such quoting, copying, or publishing must be solely for scholarly purposes and will not involve potential financial gain. It is understood that any copying from or publication of this dissertation which involves potential financial gain will not be allowed without my written permission.

Ryan Cheek

NOTICE TO BORROWERS

All dissertations deposited in the Georgia State University library must be used in accordance with the stipulations prescribed by the author in the preceding statement. The author of this dissertation is:

Ryan Glenn Cheek
Department of Learning Sciences
College of Education & Human Development
Georgia State University

The director of this dissertation is:

Brendan Calandra, Ph.D.
Department of Learning Sciences
College of Education & Human Development
Georgia State University
Atlanta, GA 30303

CURRICULUM VITAE

Ryan Cheek

ADDRESS: 1505 Thurston Snow Road
Good Hope, GA 30641

EDUCATION:

Ph.D.	2018	Georgia State University Learning Technologies
M.S.	2012	Georgia State University Instructional Technology
B.A.S.	2007	St. Petersburg College Veterinary Technology
A.A.S	1999	Gwinnett Technical College Veterinary Technology

PROFESSIONAL EXPERIENCE:

2018-Present	Program Director-Veterinary Technology Gwinnett Technical College
2007-2018	Instructor-Veterinary Technology Gwinnett Technical College
1998-2010	Technician-Emergency/Critical Care Bluepearl-Georgia Veterinary Specialists

PRESENTATIONS AND PUBLICATIONS:

Cheek, Ryan. (2003, 2010, 2017). Snakes. In B. Ballard, & **R. Cheek** (Eds.), Exotic Animal Medicine for the Veterinary Technician (1st, 2nd, & 3rd ed.). Ames: Wiley-Blackwell.

Cheek, Ryan. (2011). Preventing Canine Tick-borne Diseases. Veterinary Technician , 32 (3).

Cheek, Ryan. (2009). What Can You Get From Your Pet? Veterinary Technician , 30 (6).

Cheek, Ryan. (2005). Leopard Geckos: Husbandry, Nutrition, and Breeding. *Veterinary Technician* , 26 (11).

Cheek, Ryan. (2004). Responsible Reptile Ownership for the Veterinary Staff. *Veterinary Technician* , 25 (8).

PROFESSIONAL SOCIETIES AND ORGANIZATIONS

- | | |
|------|---|
| 2018 | Academy of Veterinary Emergency and Critical Care Technicians |
| 2018 | National Association of Veterinary Technicians in America |
| 2018 | Georgia Veterinary Technician and Assistant Association |
| 2018 | Veterinary Emergency and Critical Care Society |
| 2018 | Association of Veterinary Technician Educators |
| 2018 | Association for Educational Communications and Technology |

AN EXAMINATION OF PRE-MAJOR HEALTH STUDENT'S READINESS FOR INTER-PROFESSIONAL EDUCATION AT A TECHNICAL COLLEGE

by

RYAN CHEEK

Under the Direction of Brendan Calandra

ABSTRACT

Interprofessional education (IPE) can be defined as knowledge gained when two or more professionals (or students) learn about, from, and with each other to enable effective collaboration and improve health outcomes (World Health Organization, 2010). The ultimate goal of IPE is to improve patient care outcomes through the promotion of teamwork, and through collaboration between various healthcare professionals. The current literature supports the notion that the concept of IPE should be initiated as early in the educational process as possible, and sustained throughout a student's education. This study examined a group of early career health sciences students at a local technical college. Participants' knowledge of IPE and perceived readiness to enter an IPE program were tested before and after working on an online instructional module focused on IPE with a health science focus. Participants' knowledge of IPE and perceived readiness to enter an IPE program were tested before and after working on an online instructional module focused on IPE with a health science focus. Participants' knowledge of IPE and perceived readiness to enter an IPE program were tested before and after working on an online instructional module focused on IPE with a health science focus. Results showed significant increases in participants' perceived readiness to enter the profession from pretest to posttest, although these could not be attributed to the intervention; and results showed generally low levels of participants' knowledge surrounding IPE.

INDEX WORDS: Interprofessional education, Associate degree, Allied health, Technical college, Diploma

AN EXAMINATION OF PRE-MAJOR HEALTH STUDENT'S READINESS FOR INTER-
PROFESSIONAL EDUCATION AT A TECHNICAL COLLEGE

by

Ryan Cheek

A Dissertation

Presented in Partial Fulfillment of Requirements for the

Degree of

Doctor of Philosophy

in

Instructional Technology

in

Learning Sciences

in

the College of Education & Human Development

Georgia State University

Atlanta, GA

2018

Copyright by
Ryan G. Cheek
2018

TABLE OF CONTENTS

LIST OF TABLES	v
OPERATIONAL DEFINITIONS	vii
1 THE PROBLEM.....	1
Introduction	1
Problem Statement	1
Purpose	2
Rationale	2
Research Questions	7
2 REVIEW OF THE LITERATURE	8
Conceptual Framework	8
When to Teach IPE	10
Where to Teach IPE	17
How is the IPE Structured.....	23
To Whom is IPE Taught.....	25
Summary of the Literature.....	27
3 METHODOLOGY	29
Participants	29
Instruments	32
<i>Readiness for Interprofessional Learning Scale.....</i>	<i>32</i>
<i>Interdisciplinary Education Perception Scale.....</i>	<i>33</i>

Validation Study & Pre-Questionnaire	34
Procedures.....	36
<i>General Overview</i>	36
<i>Asynchronous Learning Module Design</i>	37
Statistical Analysis.....	38
4 RESULTS	39
Data Cleaning	39
RIPLS	39
<i>Pre-Treatment Results</i>	39
<i>Post-Treatment Results</i>	41
IEPS	43
<i>Pre-Treatment Results</i>	43
<i>Post-Treatment Results</i>	44
Choice of majors	46
5 DISCUSSION	47
Overview	47
Question #1.....	47
Question #2.....	50
Implications.....	51
Limitations	53
Suggestions for Further Research	54
REFERENCES.....	56

APPENDICES 65

LIST OF TABLES

Table 1:	Number of healthcare workers and the lowest level of education required.....	6
Table 2:	Percentages of accredited programs based on level of degree.....	27
Table 3:	Demographics of participants.....	30
Table 4:	Cronbach alpha values of the four sub-scale model of the RIPLS of students during their first year of school.....	33
Table 5:	Comparison of Cronbach alpha scores of the same students in the original RIPLS model.....	33
Table 6:	Cronbach alpha scores and included items in the revised IEPS.....	34
Table 7:	Comparison of current validation study with other published data.....	36
Table 8:	Descriptive statistics for RIPLS.....	39
Table 9:	Mean scores for RIPLS based on anticipated major.....	40
Table 10:	Mean scores for RIPLS based on major group.....	40
Table 11:	ANOVA results for RIPLS and previous educational experience with IPE.....	41
Table 12:	ANOVA results for RIPLS and previous professional experience with IPE.....	41
Table 13:	RIPLS descriptive statistics for the treatment and control group.....	42
Table 14:	ANCOVA results for RIPLS between the control and treatment group while controlling for the pre-treatment scores.....	42
Table 15:	Descriptive Statistics for the IEPS.....	43
Table 16:	Means for IEPS and anticipated major.....	43
Table 17:	ANOVA results for IEPS and anticipated major.....	44
Table 18:	ANOVA results for IEPS and previous educational IPE experience.....	44

Table 19: ANOVA results for IEPS and previous professional IPE experience.....	44
Table 20: IEPS descriptive statistics for the control and treatment group.....	45
Table 21: ANCOVA results for IEPS between the control and treatment group while controlling for the pre-treatment scores.....	46

OPERATIONAL DEFINITIONS

The definitions below were used to describe the terms within this paper.

Interprofessional education (IPE)

Knowledge gained when two or more professionals (or students) learn about, from, and with each other to enable effective collaboration and improve health outcomes. This should not be confused with multiprofessional education in which multiple professions work, or learn, together to achieve a common goal because it requires two or more professions to complete the task.

Effective collaboration

When two or more people, or professions, work together, sharing ideas to accomplish a common goal. For the purpose of this research, effective collaboration requires that each profession understands each other's role and has respect for each other's profession.

Professional identity

Your professional self- concept created by how we see ourselves within the context of the occupation that we are in. It is the sense of oneness you have with your profession.

Professional stereotype

An image or idea of a particular profession that may or may not be based on previous experience or knowledge.

1 THE PROBLEM

Introduction

Interprofessional education (IPE) can be defined as knowledge gained when two or more professionals (or students) learn about, from, and with each other to enable effective collaboration and improve health outcomes (World Health Organization, 2010). The ultimate goal of IPE is to improve patient care outcomes through the promotion of teamwork and collaboration between various healthcare professionals. IPE is an essential step in creating a collaborative practice-ready health workforce. Collaborative practice encourages communication and teamwork among healthcare workers of different professions and backgrounds to work together with patients, families, caregivers, and communities to deliver the highest quality of care possible (World Health Organization, 2010). Despite a recent push for more IPE in healthcare workers and students, IPE is not a new concept and dates as far back as the 1960's (Thistlethwaite, 2012). IPE training provides workers and students with the opportunity to learn teamwork (Hammick, Freeth, Koppel, Reeves, & Barr, 2007), better understand their profession's role in health care and recognize roles of other health care professions (Wamsley, et al., 2012), understand professional stereotyping (Jakobsen, Hansen, & Eika, 2011), and understand the centrality of the patient to care delivery (Thistlethwaite, 2012).

Problem Statement

Despite the explosion of interest in IPE (Hoffman & Harnish, 2007) and the number of allied health careers that require less than a Bachelor's degree, there is very little research performed on the Associate degree and diploma level health science student and no research performed on the pre-health professional student at this level. There are a large number of healthcare providers in the American healthcare system that have earned an Associate's degree

or diploma and have successfully gained licensure or registration to practice their career. Why is there no research on how to teach interprofessional communication to this population of students? We should be teaching the principals of interprofessional communication to all health care providers (Bainbridge, 2014), and IPE should be initiated as early in the education process as possible (Areskog, 1988). Some have argued that based on items in the Readiness for Interprofessional Learning Scale (RIPLS) that students that lack experience in higher level courses are not prepared to learn about IPE (McFadyen A. K. et al., 2005). However, data from another study conducted on IPE over four different types of institutions showed that the only significant difference in the overall RIPLS score was between the Baccalaureate and polytechnical institute in which the Baccalaureate scored higher, and there was no significant difference between the research-intensive university, Baccalaureate, and community college overall scores (King, et al., 2012).

Purpose

The purpose of this study was to determine whether a group of students at a Technical college taking courses in a pre-health science major are ready to enter an IPE curriculum. This study also explored whether a short online module on interprofessional education had any effect on their perception of how professionals work together in the hospital setting.

Rationale

There are many reasons why IPE is important. The goal of IPE is improving health and social services. Some of the ways in which IPE has been able to achieve this broad goal is by preventing and changing stereotypes and failures of trust and communication among professionals (Carpenter, 1995), promoting collaborative competence (Barr, 1998), and creating a more flexible workforce (Department of Health, 2000). IPE has also been identified to help improve

the quality of care, focus on the needs of services of patients and caregivers, involve both the patient and caregiver, encourage professionals to learn about and with each other, promote respect among healthcare providers, enhance practice within professionals, and increase professional satisfaction (CAIPE, 2006).

The World Health Organization (WHO) has long identified IPE as an essential part of medical education and training, and in 2010, published Framework for Action on Interprofessional Education and Collaborative Practice. WHO has identified IPE as an integral part of medical education by providing an opportunity for people from different professions to work and learn together, which provides them with the opportunity to learn about each other's profession and begin developing a foundation for a collaborative practice ready healthcare team (World Health Organization, 2010). According to WHO (2010), IPE is the foundation that leads to students graduating ready to enter a collaborative practice that provides the optimal health services. In this report, WHO performed a survey of IPE initiatives in 42 countries representing all six WHO regions. The survey showed that students going through IPE training gain real world experiences and insight and that the students learned a great deal about the roles and responsibilities of other practitioners (World Health Organization, 2010). The data also showed that IPE could benefit the healthcare system by improving workplace practices and productivity, improved patient outcomes and safety, increasing staff morale, and providing better access to a healthcare provider (World Health Organization, 2010). WHO (2010) also identified many benefits to a collaborative practice such as improvements in the access, coordination, and use of specialists, decrease of hospital stay, tension and conflict among caregivers, staff turnover, hospital admissions, and clinical errors, and can also reduce the cost of medical care and the healthcare system.

In response to reports from WHO, numerous countries and regions have formed IPE collaboratives such as the Canadian Interprofessional Health Collaborative, the Center for the Advancement of Interprofessional Education in the United Kingdom, the European Interprofessional Education Network in Health and Social Care, the Australasian Interprofessional Practice and Education Network, and in the United States, the Interprofessional Education Collaborative was formed.

The National Health Service (NHS) in the United Kingdom has also made many recommendations about IPE under the direction of the Department of Health. A 2000 report published by the Department of Health called “A Service of All The Talents: Developing the NHS Workforce”, identified IPE as an integral part of advancing the healthcare system in the United Kingdom (Department of Health, 2000). Based on this report, the NHS desires that graduating students be prepared to enter a collaborative practice by teaching them the roles and responsibilities of other professionals, to be able to work in a multidisciplinary team, to be able to fill in in other roles on the team as necessary, and to provide more flexibility in career routes (Finch, 2000).

Since IPE is an important aspect of medical education and training, it is important to understand when the best time is to begin teaching IPE. The timing of training is one of the biggest controversies facing IPE (Hoffman & Harnish, 2007). Historically, it was thought that IPE should not be initiated until after licensure (Barr, 2002), and the literature supported that notion when an analysis of the literature showed less than thirty percent of the literature was on pre-licensure students (Freeth, Hammick, Koppel, Reeves, & Barr, 2002). Despite the historical perspective, the newest trend in IPE is initiating IPE training at an earlier point in the student’s training (Hoffman & Harnish, 2007). It was first introduced by Areskog (1988) that IPE be instituted early in the undergraduate curriculum and was later found that earlier adoption of IPE in

health education curriculum would have the same benefits of providing IPE in more advanced students as long as the IPE was part of the curriculum throughout the entire program (Carpenter, 1995, Parsell, Spalding, & Bligh, 1998, General Medical Council, 1993). Hoffman and Harnish (2007) were the first, and possibly the only, researchers to look at having students take an IPE exercise while taking their prerequisite courses for entry into their health program. They created a program that introduced the participants to eight health professions. The participants filled out a survey prior to beginning the program and then immediately afterwards to assess their changes in five indicators; acquisition of knowledge of the health professions, acquisition of knowledge of interprofessionalism, interest in gaining more information about other health professions, interests in pursuing different health professions as a career, and attitudes toward IPE and practice. At the end of the study, the researchers found that this one time exercise had a dramatic effect on the student's changes in attitudes, interests, and knowledge of IPE and health careers. One interesting result is that some professions had fewer interests in being pursued by the participants after the exercise than before. This finding highlights one of the important aspects of introducing IPE early in the curriculum. The students are required to learn more about other professions, and this could effect which major they ultimately choose. Ultimately, Hoffman and Harnish (2007) demonstrated that undergraduate students enrolled in a Bachelor degree program taking prerequisite courses are prepared to learn about IPE and that these students benefit from the experience by making better choices afterwards with regards to their future career choice, and they may have less negative stereotypes of other professions as they enter their major courses.

A literature review of IPE using any search engine or database will find literally thousands of articles on IPE in undergraduate, graduate, and post-licensure training; however, there is a dearth of information in the literature about IPE in the Associate degree, diploma, and certifi-

cate program career training courses. This is a severely overlooked population that comprises a large number of the healthcare workers in the United States as shown in Table 1.

Table 1
Number of healthcare workers and the lowest level of education required

Education	Job Title	No. Employed
Certificate or Diploma	Dental Assistant	318,800
	EMT & Paramedic	241,200
	Medical Assistant	591,300
	Licensed Practical Nurse	719,900
	Nursing Assistant	1,545,200
Associate Degree	Dental Hygienist	200,500
	Diagnostic Medical Sonographer & Cardiovascular Technologist	112,700
	Nuclear Medicine Technologist	20,700
	Occupational Therapy Assistant	41,900
	Radiation Therapist	16,600
	Radiologic Technologist	230,600
	Registered Nurse	2,751,000
	Respiratory Therapist	120,700
	Surgical Technologist	99,800

Note. This table represents the minimum degree required to gain licensure in the United States, but does not imply the preferred degree. Adapted from "Occupational Outlook Handbook, 2016-2017 Edition" by the Bureau of Labor Statistics, U.S. Department of Labor.

Recognizing the importance of the different educational requirements for the healthcare careers and the importance of working and learning together, King et al (2012) compared the readiness of IPE on four different types of educational institutions in Canada; research-intensive university, baccalaureate, polytechnical institute, and community college. The participants included 1,526 students across 35 different programs. Overall, the researchers found that the analysis of variance showed significant differences between the institutions; however, an analysis of the means showed that there was little variability. Specifically comparing the community college and polytechnic institute (these two institutions closely resemble the technical college student in the United States) to the research-intensive university showed almost exact means in the

different subscales for the RIPLS. This study shows that students in lower degree granting institutions are able to learn just as much from an IPE exercise than those more advanced students.

This study is taking from Hoffman and Harnish (2007) and King et al. (2012) that students in any level of health education are prepared to learn IPE and can benefit from the addition of IPE in the curriculum, and that students should be introduced as early as possible to IPE and continue the IPE throughout their educational and professional careers. No other study has looked at the readiness or effect of IPE on health majors taking prerequisite courses.

Research Questions

1. Are a group of Associate degree and diploma level pre-health science majors at a technical college in the Southeastern United States ready to enter an inter-professional education program?
2. Will an online IPE module influence the students' understanding of the importance of collaboration in the educational and healthcare environment?

2 REVIEW OF THE LITERATURE

Thistlethwaite (2012) identified five areas of challenge for IPE researchers and educators. These areas, as she states, are the areas where researchers and educators must demonstrate when to teach IPE, where to teach IPE, how is the IPE structured, to whom is the IPE taught, and who teaches the lessons. The following review of the literature will explore these challenges as they apply to this research project. This review will not cover the last challenge, who teaches the lessons, as that does not directly apply to the research questions posed in this study.

Since there is little research published regarding the population of students that are included in this study, this literature review will focus on studies performed on other groups of students that have concepts that will justify this study as well as highlighting the studies that do include this group of students. Using the four areas of challenges as stated above and my conceptual framework, I will review the literature on why pre-health major students should learn IPE (when to teach IPE), that it is acceptable to teach IPE in a non-clinical setting (where to teach IPE), that students are able to learn about IPE in an online learning environment (how is the IPE structured), and that all future healthcare workers should be included in an IPE curriculum no matter their level of education (to whom is IPE taught).

Conceptual Framework

The healthcare system in the United States is a complex system. It relies on dozens of different health professionals to work together to provide individualized patient care. Each health profession has its own social identity and set of specialized skills and knowledge that adds to this complex system. The social identity and skills that each profession has, along with how the profession is trained leads to the professional culture. This professional culture shapes the

way those individuals think, feel, and behave and ultimately helps them define what is health (Pecukonis, Doyle, & Bliss, 2008).

Pecukonis, Doyle, & Bliss (2008) coined the term profession-centrism to describe the process in which professions view the world from the perspective of their professional culture. This term was derived from ethnocentrism first described by William Graham Sumner as the view one takes from the perspective of their own culture (Pecukonis et al., 2008). According to Sumner, this view of ethnocentrism suggest that strong group affiliation will lead to negative attitudes towards other cultures and groups, known as the out groups. Taking the theory of ethnocentrism into the professional setting, Pecukonis et al. (2008) applies their term, profession-centrism, to the narrowed view of the world seen within one's own profession. They state that the educational culture of profession-centrism encourages educators and students to disregard any appreciation of the diversity of healthcare disciplines, creating a culture of competition instead of collaboration. Due to this culture, the students are taught a template for bias that shape their attitudes, perceptions, and behaviors (Pecukonis et al., 2008). To counter this profession-centrism, Pecukonis et al. (2008) suggest instituting interprofessional cultural competency as early in the educational tenure as possible as well as creating opportunities for students and faculty of other professions to take courses together so that they can learn about each other with each other. This early and shared educational experience will help the students gain an appreciation for what the other professions do, as well as learn the importance and impact that an interprofessional team has on patient care (Pecukonis et al., 2008). Interprofessional cultural competency refers to the ability of a professional to work collaboratively and effectively with different members of the healthcare team (Hamilton, 2011). Similar to profession-centrism, others have found that a lack of IPE training and professional socialization has lead to

professional protectionism and tribalism due to undervaluing and misunderstanding each others role in healthcare (Barnsteiner, Disch, Hall, Mayer, & Moore, 2007).

The foundation of this research is grounded on the idea that if professions train in silos only working with students and faculty within their own profession, that this will create boundries and distrust between other professions (Petrie, 1976). Training of healthcare workers should focus on a goal rather than on their specific profession (Petrie, 1976). The goal should be providing an interprofessional environment in which the patient is the central figure and that all professions work with each other to provide for better patient outcomes.

When to Teach IPE

The timing of IPE has been an important topic in the literature over the past thirty years. Areskog (1988), The General Medical Council (1993), Carpenter (1995), Parsell et al (1998), and Horder (1995) all found that early and sustained IPE starting as early in the educational process as possible would be the most beneficial tactic in creating a collaborative practice ready healthcare workforce.

Cooper, Spencer-Dawe, and McLean (2005) showed that first year students from multiple health majors in a university setting in Great Britain could learn from an IPE program. Their research found that students that enrolled in the IPE program significantly raised awareness about collaborative practice, and it increased the students' confidence in their own professional identity. This study highlights how IPE programs can help a student not only learn how to collaborate with other professionals but also helps them begin identifying themselves as a member of the profession they are majoring in. This study also points out how the students that attended the IPE program have a higher value of the different professions after they completed the program. Ateah et al. (2011) also showed the perceptions of other health fields were more positive after an

IPE module was completed. This study was completed using participants from first year to fourth year undergraduate students in seven different health related fields. Both of these studies support the notion that students very early in their educational tenure, prior to firmly established professional identities have been established, can learn and benefit from an IPE initiative. These studies also indicate, that if early IPE is offered, that the students will most likely have a higher respect for other professions and would therefore be more prepared to work in a collaborative environment. This notion is further supported by Mitchell, McCrorie, and Sedgwick (2004) and Forte and Fowler (2009).

Mitchell et al. (2004) looked at student attitudes of learning anatomy in a dissecting lab in a multi-professional context. In the dissecting lab, the first semester health and medical students were divided into random groups to ensure that each group had students from different health majors. Each group also had an instructor. The instructors had varied backgrounds but were all qualified to teach anatomy at this institution. The results showed that nursing and medical students were the ones that least enjoyed working in the multi-professional group and those that thought the size of the group hindered their learning were the medical and radiography students. Quantitative and qualitative data were obtained and the authors found that the students entered the course with stereotypes of the other professions, and their anxiety for entering this difficult course was exaggerated by the thought of having to work with students outside of their major. Again, as found in this study, if the students can be exposed to IPE earlier in their education, there may be a reduction in their negative stereotypes of other professions and will enable them to work better in a collaborative environment (Mitchell, McCrorie, & Segwick, 2004).

Forte and Fowler (2009) performed a qualitative study on the student and faculty experiences of participating in an IPE module. The students involved in this study were enrolled in an

undergraduate health major at a university in London, U.K. With regards to experiences of the students, one of the biggest challenges they found was working with people that thought differently than they did. Since these students were well within their educational program, their professional identities were becoming more established, and they were more likely already becoming a member of their professional culture, which created a more challenging environment to work in. However, the students all realized the importance of IPE was to see how important it is to be able to communicate with other professions to benefit patient outcome. The students acknowledged that the different professions have different philosophies of health and being able to talk and work with students from other professions help the students understand the different philosophies that will ultimately help with interprofessional communication post-licensure (Forte & Fowler, 2009).

Hammick et al. (2007) performed a review of IPE initiatives in pre-licensure students and noted that most of the initiatives were voluntary IPE courses and were not made mandatory. This indicates that most health students will graduate and enter the workforce with having little or no experience interacting with other professions or students within other health related majors. This lack of exposure leaves the student with certain perceptions and understandings of other professions that may or may not be accurate, yet they go unchallenged due to the lack of opportunity for direct interactions with students or faculty from other professions (Ateah, et al., 2011). Professional stereotypes have an influence on how well interprofessional teams work together, and because of that, it is crucial that early in their educational tenure, the students be able to have direct interaction with students and faculty from other health professions (Carpenter, 1995). These negative stereotypes have also been shown to lead to work dissatisfaction (Ryan & McKenna, 1994). These perceptions, or stereotypes, usually begin when a student first has con-

tact with that profession, which is not always when the student begins their education (Olson, Klupp, & Astell-Burt, 2016). Olson, Klupp, and Astell-Burt (2016) found in their study using interviews that many of their participants began developing their professional identity well before starting on an educational program to become that profession. Their participants talked about their personal reasons for entering the field and how they began identifying as that professional years before. Olson et al. (2016) noted two occupational therapy students that had siblings with disabilities and their routine exposure to occupational therapists established their professional identity before entering a professional educational program for occupational therapy.

The early adoption of IPE curriculum could also be one of the most important tools to prevent negative attitudes and stereotypes among healthcare students (Horder, 1995). Professional stereotypes have been found very early in student's professional studies. The study performed by West, Miller, and Leitch (2016) found that first year students had more positive perceptions and attitudes about IPE than the more advanced students. Many students arrive at the start of their training with firmly established stereotyped views of other health professions as found in Olson et al. (2016). This pre-established stereotype has a higher likelihood of holding these views if the student has a parent that is in the healthcare field (Tunstall-Pedoe, Rink, & Hilton, 2003). Professional doctrines develop quickly in a student's training, and providing IPE early within their education can help prevent the development of stereotypes (Cooper, Spencer-Dawe, & McLean, 2005).

Considering the early adoption of stereotypes that can occur prior to students entering their career training, Mandy, Milton, and Mandy (2004) looked at first year podiatry and physiotherapy student's stereotypes of each other before and after a semester of interprofessional education. They found that both groups entered into their education with negative stereotypes of

each other, and that their education reinforced these preconceived perceptions. The results of this study showed that the physiotherapy student's perception of podiatry negatively changed at a statistically significant level after the semester of IPE, and the podiatry student's perceptions of the physiotherapy students had a positive change, but the change was not statistically significant. This study supports the model proposed by Hind et al. (2003), in which they suggest there is a negative relationship between stereotyping of a different professional group and its professional identity. This model suggests two things that are important to the timing of interprofessional education. First, this model is based on the assumption that students that identify strongly and positively with their own profession will rank other professions more negatively. Second, this model states that there will be a negative relationship between the student's readiness to embark in IPE and their professional identity (Hind, et al., 2003). This model indicates that the stronger the student identifies with their own profession, the less likely they will be to benefit from an IPE module or experience. As the student continues through their educational program, the more positively and strongly they will identify with their own profession, and the less likely it will be that an IPE initiative will have a positive effect (Mandy, Milton, & Mandy, 2004). The Hind model and the study performed by Mandy et al. (2004) that supports this model, suggest that we should consider the timing of when IPE is taught and how the groups are encouraged to work together. As the student progresses, they will subscribe to the culture of their professional group with regards to communication and language, which leads to stereotypical judgments (Mandy et al., 2004). The implications of this study show that professional socialization is an important part of becoming part of a profession, but also that maybe we are starting to teach IPE too late in the curriculum to be effective.

Professional socialization has been found to be an important aspect of career training. Over the course of a person's career, they are continually being socialized into the culture of that career (West, Miller, & Leitch, 2016). Each career has its own professional culture, which can be defined as a body of learned behavior common to a group that shapes their way of thinking, feeling, and behaving, that guides the educational process from curriculum development to the determination of health and treatment modalities (Pecukonis, Doyle, & Bliss, 2008). In order for an IPE initiative to be effective it must change attitudes, reduce prejudices, challenge pre-existing professional socialization, and challenge stereotypes and assumptions (Hamilton, 2011). Within the silos that the health student learns in, they are taught to act, think, and talk like their profession. Each profession has their own culture, and when the student is taught within the walls of their profession, it does not allow them to challenge the stereotypes and assumptions that their career has for others.

Other than preventing negative stereotyping, early adoption of IPE can also help a student with career choice. This aspect of IPE is not well represented in the literature. Early exposure to a particular profession has been linked to positive career choice, professional socialization, and job satisfaction (Price, Doucet, & McGillis Hall, 2014). Choosing a profession is a difficult task and is often done based on perceived differences of the professions being considered (Price et al., 2014). This is where IPE can help if it is provided very early in the educational process.

Olson et al. (2016) found that offering IPE early in the educational program lead students to confirm that they were in the correct program, or that the major they had declared was not the best fit for them. In this study, students commented that during their first year they did not know much about their profession and that the first year was spent getting to "know" their profession, but they were eager to learn the philosophies and practices of their discipline. Many students also

commented on how working in an interdisciplinary group and learning about other professions helped them decide to change majors before they were too far into their program. They found the interprofessional units to be a very important factor in developing their professional identity and in career choice (Olson et al., 2016)

Synthesizing the literature on when to teach IPE, the literature overwhelmingly favors the early adoption of IPE initiative as early in the educational process as possible. The early adoption will help prevent negative stereotypes, help students learn how to communicate and work with people that think differently and have different philosophies of practice, and will help the student make the correct career choice. The literature reviewed above was only looking at undergraduate students in university-based institutions that were already in their professional program. What about the students before they get into their professional program?

Hoffman and Harnish (2007) published the only paper on providing IPE education to students in pre-health courses. The students included in this study are those that are taking undergraduate prerequisite courses to enter into a health major. The research team developed an IPE program that taught the students about eight different health occupations and interprofessionalism that included self-directed independent research, problem-based learning, and collaborative group discussions. The researchers had the participants take a questionnaire before and after the completion of the program. A total of 161 students participated, and the results showed significant improvements in the student's knowledge on the roles and responsibilities of the different health occupations, the value of interprofessionalism, interest in pursuing different health careers, and attitudes toward IPE. The results also demonstrated that the students wanted to learn more about the different health occupations and gained a stronger interest in becoming a member of the healthcare team (Hoffman & Harnish, 2007).

Where to Teach IPE

Historically there has been some debate as to whether IPE should be taught in the classroom, or specifically in a clinical setting (Thistlethwaite, 2012). However, with recent initiatives by WHO and many other government agencies around the world, the consensus is that IPE should be initiated early in the educational setting and that IPE is most effective if began in pre-licensure, pre-clinical education (Interprofessional Education Collaborative Expert Panel, 2011). The Interprofessional Education Collaborative Expert Panel (IECEP) developed the core competencies in IPE (IPEC) in their report in 2011. This report contains details about the four core competencies of IPE (values/ethics, roles/responsibilities, interprofessional communication, and teams and teamwork) and suggestions on how to implement these competencies in an educational setting. However, the report specifically states that IPE is a continual learning process that should start when the student enters their educational program and continue through their entire professional career (Interprofessional Education Collaborative Expert Panel, 2011).

For any educational program to be successful there must be a curriculum framework. Several different frameworks have been created to teach IPE (Interprofessional Education Collaborative Expert Panel, 2011, Moran, Steketee, Forman, & Dunston, 2015, D'Amour & Oandasan, 2005, Kahaleh, Danielson, Franson, Nuffer, & Umland, 2015). The University of Toronto uses a three-stage framework where the students get exposure to IPE, they then get immersed in cases and other simulations within a multidisciplinary group, and finally the students culminate their learning in the clinical setting (Interprofessional Education Collaborative Expert Panel, 2011). Kahaleh, Danielson, Franson, Nuffer, and Umland (2015) developed a longitudinal curricular framework that begins in the student's first and second year where they get exposed to the concepts of IPE by working in multidisciplinary groups learning about ethics and

roles and responsibilities. During the third year of their education, the students begin using what they learned about IPE and practice in simulations, and finally their fourth year is spent applying their IPE knowledge into the clinical setting. This framework specifically takes the IECEP domains by teaching the first and second domain the first two years, the third and fourth domain is emphasized the third year, and finally the student is able to apply this learning and be assessed during their last year when they are in the clinical setting.

Moran, Steketee, Forman, and Dunston (2015) developed a more complex framework that they called the 4D framework based on its four-dimensional shape. This model takes into account all stakeholders from the students, to the educators, to the practitioners, and even considers the administration at the institution (Moran et al., 2015). The first dimension is designed to identify future healthcare practice needs. It takes curriculum development into a global perspective relating what is occurring in healthcare with regards to trends and initiatives and links those to the development of knowledge, competencies, capabilities, and practice. The second dimension considers the knowledge, capabilities, and attributes a health professional is required to have to perform their job. The third domain deals with the teaching, learning, and assessment of what was described in the first and second dimensions. Lastly, the fourth dimension considers the culture and policies of the institution that will guide how and when the IPE initiative is delivered. The framework by Moran et al. (2015) is guided more by instructional design principals as it looks similar to the ADDIE model than is guided by the IECEP domains and structure recommended by that panel of experts as we saw with the University of Toronto (2011) and Kahaleh et al. (2015). However, all of the domains are considered within this 4D framework, but this model allows the curriculum to be developed with a more universal holistic approach that goes beyond the four basic domains of IPE.

The most common framework seen in the literature is by D'Amour and Oandasan (2005). Their framework shows the complexity of the practice of interprofessional communication and IPE. It seeks to establish the linkages between the determinants and processes of collaboration at all levels. This framework establishes the links at the micro level between learners, teachers, and professionals, at the meso level between teaching and health organizations, and at the macro level between political, socio-economic, and cultural systems (D'Amour & Oandasan, 2005). The framework is composed of two circles: one circle with the student in the middle describes the educational system. The student is at the core of this circle with all of the factors surrounding them that will affect how well they become a competent collaborative practitioner. The student will be affected by their own beliefs and attitudes as well as those held by their instructors. They will also be affected by the teaching style and philosophies of their instructors as well as the leadership, resources, and administrative processes that occur at the institution. The second circle is composed of processes and factors that affect patient outcomes in collaborative practices. This circle has the patient as being the central unit as their outcome is based on organizational and interactional factors that affect how well collaboration takes place. One of the key components of this model was to develop the student's core competencies in interprofessional collaborative practice and to enhance the educators' ability to provide that education (Mann, et al., 2009). One key component of not only this model, but those described above, is that the framework all starts with the students in pre-clinical education. Based on these curriculum frameworks, the student must first learn some basic skills in IPE such as those described in the first three domains described by IECEP before embarking on direct patient care in a collaborative practice.

By examining the framework for providing an IPE initiative, it is evident that IPE must be taught early in the educational program; however, does this early education without the experience of clinical work relate to better student learning and ultimately a student that is ready to enter into a collaborative practice? Lapkin, Levett-Jones and Gilligan (2013) performed a systematic review of the effectiveness of IPE in a non-clinical setting and found that student's attitudes and perceptions towards interprofessional collaboration and clinical decision making can be enhanced through IPE. Ateah et al. (2011) had a sample group of 51 students from different levels of education and from seven different health majors, all without any clinical experience. They randomly assigned each participant into one of three groups; a control group, an education only group, and an immersion group. Each group at the start of the research filled out the Student Stereotyping Rating Questionnaire (SSRQ). Then the education group and immersion group took a two-and-a-half day course on IPE. At the end of this course, the participants again filled out the SSRQ, and then the immersion group went to do an immersion course that included shadowing professionals in the field. At the end of the shadowing, the participants in the immersion group again filled out the SSRQ. The researchers found a significant positive difference in the baseline SSRQ and the one filled out after the educational experience. However, there was no statistically significant difference between the second and third SSRQ completed by the immersion group. This study indicated that classroom learning and interactions are sufficient enough to make a drastic change in the student's perceptions of other professions, which is a foundation of IPE. Changes in attitude and perceptions has been a key research finding with regards to IPE in the classroom. Lindqvist, Duncan, Shepstone, Watss, and Pearce (2005), Cooper et al. (2005), and Nitz, Davidson, and Fox-Young (2013) all showed that after a classroom module on IPE in students with no clinical experience, there was statistically significant improve-

ments in their readiness to embark in an interprofessional team, and their stereotypes and perceptions of other professions also improved significantly.

The preceding literature focused on teaching the entry-level interprofessional domains. Teaching higher level skills such as teamwork is also practical in the classroom setting to better prepare students to interact with actual patients in a collaborative practice. Bolesta and Chmil (2014) performed a study with pharmacy students and nursing students using a high fidelity human patient simulator. The students were in groups of two nursing students and two to three pharmacy students. They went through a scenario of a patient that had been stable following an acute exacerbation of heart failure that developed weakness and new onset of shortness of breath due to atrial fibrillation just prior to the morning change of shift by the nurses. The students did not know of the cause of the new symptoms. The pharmacy students and nursing students were assigned roles as would be applicable to this patient. The patient simulator was in a room that mirrored what would be encountered in a hospital that was equipped with everything that the students needed to work through the case and treat the patient. The instructors ran a preprogrammed simulation through the high fidelity simulator and gave verbal cues when appropriate. The students had to work together to find the cause of the patient's new symptoms and begin treatment. Following the scenario, the students found the exercise to be very productive by putting a real life experience to practice and also had a significant increase in their perception of the importance of a collaborative practice. (Bolesta & Chmil, 2014).

Another example of how advanced IPE skills can be taught in the non-clinical setting is by using case-based approaches in a multidisciplinary team. Sander et al. (2016) used teams of doctor and physiotherapy students to work through cases of patients with rheumatic and musculoskeletal diseases (RMD). These diseases were specifically picked since these diseases are both

prevented and treated by physicians and physiotherapists. This study was a longitudinal study that was unique in that it started in the classroom, yet ended in the clinical setting. The students first had their exposure to the IPE during the first year of studies looking at anatomy and physiology, pathophysiology, and patient examination and history taking. Then they progressed to eventually working in a clinical setting working together to diagnose and treat patients with a RMD. The researchers found that the students and faculty both enjoyed working together in the classroom due to the different perspectives that were brought in from the different professions. The instructors mentioned that more robust discussions occurred than in previous courses that were uniprofessional. The faculty also saw a positive difference in the ability of the students to enter the clinical section and their ability to diagnose and treat RMDs. An important implication that this study shows is that the students not only learned IPE in the classroom, but it was brought over into the clinical setting as well. As highlighted in D'Amour and Oandasan's (2005) framework on IPE, it is crucial that what the student learns in the classroom be able to translate and be practiced in the hospital setting. It is also stated in this model that there may be a culture or processes within the hospital system that would prevent a collaborative practice from occurring.

Looking at the effectiveness of their IPE initiative, Derbyshire and Machin (2011) interviewed a group of newly qualified nurses six months after their qualification. They had positive things to say about how much they learned about other professions as well as their role in the health care system as well as about how they were able to change some of the stereotypical perceptions they had about other professions. The most important implication from this study was how the nurses described the culture and efficacy of communication networks within their institution. In other words, they felt as though their education was beneficial and prepared them to

work in a collaborative environment, but systems within the hospital prevented them from practicing what they had learned. Murray-Davis, Marshall, and Gordon (2012) found similar results in their study on midwives. Their participants stated that they had a hard time transferring their knowledge of IPE in a practice that did not promote collaboration, and they felt as though the issue with a lack of collaboration in the hospitals was not due to poor education on IPE but was due to a lack of buy-in on the IPE agenda within the hospital system.

Compiling the above referenced literature to answer the question of can IPE be taught in the classroom to prepare students to work in a collaborative practice, I find that students can benefit from the classroom. Based on the frameworks presented by D'Amour and Oandasan (2005) and Moran et al. (2015), IPE must start in the classroom with the patient and the student being the central figures. The core competencies created by IECEP must also be taught, with the first two domains being taught early in the educational program. By having an understanding of professional ethics and values as well as professional roles, the student will then be able to move onto more advanced skills such as working in a team and eventually working with patients. It is also evident by Sander et al. (2016), Derbyshire and Machin (2011), and Murray-Davis et al. (2012) that what is learned in the classroom can also be transferred over to the clinical setting as long as the hospital has systems in place that promote, and do not discourage, collaborative practices.

How is the IPE Structured

Distance education is not a new topic, and has been around for almost as long as there have been radios in households. With the invention of the internet in the 1980's, distance education has moved from the radio, to the television, to VHS tapes, and finally onto the internet. Distance education is also not a new topic in health education and dates back to the 1960s (Knebel,

2001). The potential benefit of online education is that it removes some of the barriers that have plagued IPE initiatives. Common barriers seen in IPE initiatives that could be removed with an online curriculum would include logistical concerns such as bringing groups of people together, providing time within the classroom, and space availability (McKenna et al., 2014, Clouder, 2008).

One of the biggest benefits to online education in IPE is that it enables multiple institutions, or institutions with multiple campuses, to come together in a single classroom without having to travel (Myers & O'Brien, 2015). Myers and O'Brien (2015) were able to bring together three different disciplines (occupational therapy, speech-language pathology, and physical therapy) from two different universities into a single online classroom with positive results. The participants in this study commented on their increased understanding of the roles of the other disciplines and how the disciplines work together in a clinical setting.

Positive and similar results have also come from studies in single campus institutions bringing together multiple disciplines into an online learning environment. McKenna et al. (2014) brought together students from five different health majors (paramedics, nursing, occupational therapy, physiotherapy, and nutrition & dietetics) into an online course. The qualitative analysis of this study showed two main themes; professional understanding and patient-centeredness. The participants commented on how the videos in the online course better demonstrated what other professions did and how the professions work together in real life situation as opposed to talking about abstract concepts in a face-to-face course. The videos in the course also made it clear how working in a collaborative environment makes the patient the central focus.

McKenna et al. (2014) and Myers & O'Brien (2015) both showed how online classrooms can bring together students that would not normally interact with each other into a single learn-

ing environment. Both of these studies also highlighted that one of the biggest benefits to these online courses, from the student's perspectives, was that it gave them a better understanding of what other professions do and how each of the professions work together to provide patient care. Evans, Knight, Sonderlund, and Tooley (2014) looked at the facilitators' experiences while working in online IPE courses. The facilitators noted that the greatest strength they saw in the online course was the student's ability to learn about the roles and responsibilities of other health professions and team dynamics. The results of these studies demonstrate the appropriateness of teaching IPE in an online format to help the student learn about the different professions and see how they work together in the clinical setting.

To Whom is IPE Taught

Despite the fact that Thistlethwaite (2012) stated that one of the difficulties in IPE is determining who should be taught IPE, there is no published research that specifically addresses this topic. However, multiple agencies (CAIPE, 2006, Department of Health, 2000, General Medical Council, 1993, Interprofessional Education Collaborative Expert Panel, 2011, World Health Organization, 2010), as well as individual researchers (Areskog, 1988, Bainbridge, 2014, King et al., 2012, Hoffman & Harnish, 2007), have all stated that IPE should be included in the curriculum of all healthcare programs without listing any exceptions. The research on IPE is almost exclusively on the baccalaureate and graduate student as well as the post-licensure professional and, with one exception, does not include the Associate degree or diploma level students. The one article that includes Associate degree and diploma level students was performed by King et al. (2012) in Canada. They did a cross-institutional study comparing the readiness for interprofessional learning on students from a research-intensive university, a baccalaureate college, a polytechnical institute, and a community college. The Canadian polytechnical colleges

and community colleges offer Associate's degrees, certificates, and diplomas similar to the American community and technical colleges. They found that students from the polytechnical college scored higher on two out of the four subscales (negative professional identity and roles and responsibilities) of the RIPLS than the baccalaureate students, and the community college students scored higher on two of the subscales (positive professional identity and roles and responsibilities) than the baccalaureate students (King, et al., 2012). Looking at the total RIPLS scores, the polytechnical and community college students scored almost identical to the research-intensive university students (King, et al., 2012).

The group of licensed professionals that represent the Associate's degree and diploma level student makes up a significant amount of the healthcare industry. Considering accredited nursing programs, in 2015 there were 228,856 enrolled students, of which 64% of those students were enrolled in Associate's degree programs (Accreditation Commission for Education in Nursing, 2015). In 2014, 58% of accredited nursing programs were Associate's degree programs (National League for Nursing, 2014). Other professions that offer degrees beyond the Associate's degree show similar results; 72% of radiologic technology programs, 83% of respiratory care programs, and 80% of diagnostic medical sonography programs all offer an Associate's degree or lower (Joint Review Committee on Education in Radiologic Technology, 2016, Commission on Accreditation for Respiratory Care, 2017, Commission on Accreditation of Allied Health Education Programs, 2017). Table 2 summarizes the percentages of allied health programs based on the level of degree awarded.

Table 2
Percentages of accredited programs based on level of degree

Name of program	Number of programs	Degree awarded				
		Diploma	Certificate	Associate	Bachelor	Master
Cardiovascular Technology*	92	6.5%	13%	68.5%	12%	
Diagnostic Medical Sonography*	455	4.8%	28.1%	47.5%	18.7%	0.9%
Paramedic*	838	6.7%	52.6%	39.4%	1.3%	
Medical Assisting*	522	26.1%	36.2%	37.7%		
Surgical Technology*	506	21.1%	31.2%	47.6%		
Radiologic Technology**	602		20.4%	72.3%	7.3%	
Respiratory Therapy***	428			83.4%	15.2%	1.4%

*Adapted from Commission on Accreditation of Allied Health Education Programs, 2017

**Adapted from Joint Review Committee on Education in Radiologic Technology, 2016

***Adapted from the Commission on Accreditation for Respiratory Care, 2017

Although there is only one example in the literature of the readiness of students in an Associate's degree or diploma level program, it showed that these students were just as ready as any other student to embark in IPE. The number of students and healthcare workers in the United States that have an Associate's degree or diploma should indicate that in order to have a collaborative healthcare system, this group of students should be in a curriculum that promotes IPE.

Summary of the Literature

The literature demonstrated that IPE must be initiated early in the training of the future healthcare workers in the United States. Early adoption of an IPE curriculum will have many positive effects, and if not taught early, it will have less of an effect. The positive effects demonstrated in the literature include a positive increase in developing one's own professional identity, more positive perception and value of other professions, and a decrease in negative professional stereotypes. A less studied but proven benefit of early IPE is that it can help students with career choices. IPE has not only helped students pick the career that is right for them, it has also helped them confirm that the program they are in is not the best career choice.

The literature also shows that IPE should be taught in a pre-licensure pre-clinical setting. The setting can be in a traditional classroom with students from different professions, or in an online environment that could include students from the same college, or students from multiple colleges increasing the exposure of different professions. The online courses have shown to be very effective in promoting an understanding of the roles and responsibilities of other professions and how each of the professions work together in the clinical setting. What is important with regards of where to teach IPE and how it is structured relies on a solid framework. IPE is a very complex system and involves many different aspects that all need to come together to create a collaborative workforce.

Lastly, this literature review showed that there are many different professions working together in the hospital system. These people range in educational backgrounds from certificates to doctoral degrees. Regardless of their educational background, they all must work together, and therefore they all must learn how to work in a collaborative work environment through IPE.

3 METHODOLOGY

Participants

This research was performed with students at a technical college in the southeastern United States who were enrolled with an academic major code of pre-health. This academic major code applies to students that are taking prerequisite courses that will enable them to apply for one of the allied health majors, which include cardiovascular technology, dental assisting, diagnostic medical sonography, echocardiography technology, emergency medical technician/paramedic, health information technology, medical assisting, radiologic technology, nursing, respiratory care, and surgical technology. There were 2190 students invited to participate in this research. Table 3 describes the demographics of the participants.

The majority of the participants were female (92.3%). Males represented 7.2%, and 0.5% identified as transgender male. The participants were also young with 18-25 year olds representing 44.6% of the sample. However, there was a wide range of ages represented with 12.8% between 26-29 years old, 8.7% between 30-33 years old, 11.2% between 34-37 years old, and 23.4% of the participants were over 38 years old.

A wide range of anticipated majors was also represented. Cardiovascular technology (0.5%), dental assisting (4.1%), diagnostic medical sonography (15.3%), echocardiography (1%), emergency medical technician (1%), health information management (2%), radiologic technology (8.2%), respiratory care (2.6%), surgical technology (6.1%), medical assisting (5.6%), certified nursing assistant (1%), and registered nursing (52.6%) were all represented.

Table 3
Demographics of Participants

Gender N=194	Frequency	Percent
Male	14	7.2%
Female	179	92.3%
Other	1	0.5%
Age N=195		
18-21	56	28.7%
22-25	31	15.9%
26-29	25	12.8%
30-33	17	8.7%
34-37	22	11.3%
38-41	21	10.8%
≥42	23	11.8%
Anticipated Major N=195		
Cardiovascular	1	.5%
Dental Assisting	7	3.6%
Diagnostic Medical Sonography	30	15.4%
Echocardiography Technology	2	1%
Emergency Medical Technician	2	1%
Health Information Technology	4	2.1%
Radiologic Technology	16	8.2%
Respiratory Care	5	2.6%
Surgical Technology	12	6.2%
Medical Assisting	11	5.6%
Certified Nursing Assistant	2	1%
Registered Nurse	103	52.8%

The majority of the participants (55.3%) have completed at least twelve semester hours of prerequisite courses, and 65.7% of the participants need twelve semester hours or less to complete their prerequisite courses. The allied health programs require between four (12 semester hours) to eight (24 semester hours) prerequisite courses, the data indicates that 55.3% of the par-

ticipants have completed half or more of their prerequisite courses. A few participants, 9.7% have not completed any courses.

24.5% have also had previous experience with IPE in an educational setting. 15.8% have not had any previous IPE experience, and 59.6% were not definitely sure if they have had or not (15.8% probably yes, 21.9% might or might not, and 21.9% probably not). Some participants (41.3%) have had some professional experience working in the healthcare system. This experience ranged from office work such as front office administration and accounts receivable associate to patient care experience such as certified nursing assistant, surgical technologist, licensed practical nurse, telemetry technician, and dialysis technician. Data was not collected to indicate how much experience they have had.

122 participants indicated on the questionnaire that they would be willing to participate in the second part of this study. Those participants were randomly placed, through simple random sampling, into either the treatment group or the control group. The control group was asked to complete just the questionnaire, where the treatment group was asked to participate in an online module on IPE and then complete the questionnaire. The recruitment letters were sent out three weeks after the pre-treatment questionnaire. A total of 24 participants completed all parts and included eleven participants in the treatment group and thirteen in the control group. This gave a response rate of 19.7%. Due to the small number of participants, there was not enough data to compare the treatment group and control group with regards to anticipated majors, age, or previous experience with IPE. However, nursing majors made up the majority of each group; 54.5% in the treatment group and 69.2% in the control group.

Instruments

There are two main objectives to this research project; determining if pre-health majors are ready to embark on an IPE curriculum and their perception of IPE after an IPE learning module. The readiness for interprofessional learning scale (RIPLS) and the interdisciplinary education perception scale (IEPS) were selected to provide the information needed to answer the research questions.

Readiness for Interprofessional Learning Scale.

The RIPLS (Appendix A, part 1) was developed and has been used to assess the readiness of students to embark in an interprofessional learning environment (Parsell & Bligh, 1999). This survey consists of 19 questions on a 5-point rating scale. Originally, Parsell and Bligh (1999) developed the RIPLS with three subscales; teamwork & collaboration, professional identity, and roles & responsibilities. Later, McFadyen et al. (2005) proposed a more stable sub-scale model of the RIPLS that uses two kinds of professional identify, positive and negative, instead of one. The McFadyen et al. model was used in this study. This model uses four sub-scales; teamwork & collaboration (items 1-9), negative professional identity (items 10-12), positive professional identity (items 13-16), and roles & responsibilities (items 17-19). This four sub-scale model was used on a group of first year health and social care students at the beginning of the year and then repeated on the same students at the end of the year. The results of the Cronbach alpha values can be seen in Table 4 compared to the same students loading the results with the original three sub-scale model as seen in Table 5.

Table 4

Cronbach alpha values of the four sub-scale model of the RIPLS of students during their first year of school.

Sub-Scale	Beginning of first year	End of first year
Teamwork & Collaboration	0.79	0.88
Negative Professional Identity	0.60	0.76
Positive Professional Identity	0.76	0.81
Roles and Responsibilities	0.40	0.43
Total Scale	0.84	0.89

Adapted from McFadyen et al. (2005)

Table 5

Comparison of Cronbach alpha scores of the same students in the original RIPLS model.

Sub-Scale	Parsell & Bligh (1999)	McFadyen et al. (2005)
Teamwork & Collaboration	0.88	0.80
Professional Identity	0.63	0.21
Roles & Responsibilities	0.32	0.40

Adapted from McFadyen et al. (2005)

The increase in internal consistency is expected as the students move forward in their program developing a better sense of their professional roles and identity (McFadyen A. K. et al., 2005). The lack of knowledge and professional identity can also explain the low internal consistency of the roles & responsibilities sub-scale.

Interdisciplinary Education Perception Scale

The IEPS (Appendix A, part 2) was developed to assess a student's perception of IPE after participating in an IPE course or exercise (Luecht, Madsen, Taugher, & Petterson, 1990).

The original survey consisted of 18 questions on a 6-point rating scale. It consisted of four sub-scales; competence & autonomy, perceived need for cooperation, perception of actual cooperation, and understanding others' value. McFadyen, Maclaren, and Webster (2007) revised the model creating a more reliable three sub-scale model consisting of twelve questions. This new model was created using health and social care students at the beginning and end of their first year. The new sub-scales with their associated Cronbach alpha scores and included items are listed in Table 6.

Table 6
Cronbach alpha scores and included items in the revised IEPS

Sub-Scale	Included items in new model	Beginning of first year	End of first year
Competency & Autonomy	1, 3, 5, 7, 8	0.78	0.79
Perceived Need for Cooperation	4 & 6	0.38	0.40
Perception of Actual Cooperation	2, 9, 10, 11, 12	0.84	0.83
Total Scale		0.84	0.86

Validation Study & Pre-Questionnaire

The RIPLS and IEPS have been used extensively in IPE research since they were created. These instruments have also been used together in the same study to create more stable instruments (McFadyen, Maclaren, & Webster, 2007, McKenna et al., 2014) and also to answer the questions of the study (i.e., Maharajan et al., 2017, Wong et al., 2016, McFadyen A. K., Webster, Maclaren, & O'Neill, 2010). Although these instruments have been used extensively in research, there has only been one published report of using them in students below the Bachelor degree level. This single report was a cross-institutional study performed in Canada by King et al. (2012) and used only the RIPLS. King et al. (2012) did a confirmatory factor analysis of the four subscales and was compared to McFadyen et al. (2005). The 19 items were loaded on the four subscales and the Cronbach's alpha for each subscale was consistent with McFadyen et al. (2005). However, since no studies have validated these questionnaires exclusively on pre-health majors in Associate degree and diploma level programs, a validation study was performed during the pre-questionnaire phase of the study. Prior to sending out the recruitment letters, this study was submitted and approved by the Institutional Review Board and has been determined to meet the ethical guidelines of the institution.

The questionnaire was designed and administered through Qualtrics (Appendix A). The participants were asked to complete the questionnaire in one setting. The responses were analyzed using mean and standard deviations for the different factors as well as an overall score. Cronbach's alpha scores were also calculated. These results were compared to other published research that used the RIPLS and the IEPS together in the same study. The means of the RIPLS total score and all of the subscales were substantially lower in this study. However, the Cronbach's alpha scores were very comparable or better than the results of the other studies. The RIPLS subscale of roles and responsibilities had a Cronbach's alpha score of 0.30. This low score is expected as these students have not entered into their program of study yet and are not expected to have a great knowledge of what their future job will be. The low reliability of this subscale makes interpretation of any results for this subscale difficult and is considered during the interpretation of the results.

The results of the IEPS with regards to means and Cronbach's alpha scores were very similar between all three studies. The low reliability score with the perceived need for cooperation subscale makes interpretation of this subscale difficult and was considered when discussing the results. The results of the validation study are summarized in Table 7. The similarity in reliability indicated that these scales can be used on the population of students for this study.

Table 7
Comparison of current validation study with other published data

Domains	Wong et al. (2016) RIPLS $N = 110$ IEPS $N = 106$		McFadyen et al. (2010) RIPLS $N = 313$ IEPS $N = 312$		Current Study RIPLS $N = 195$ IEPS $N = 184$	
	Mean (SD)	Cronbach's α	Mean (SD)	Cronbach's α	Mean (SD)	Cronbach's α
RIPLS	80		78.7	0.84	50.2	0.81
Teamwork & Collaboration	39.2	0.82	39.5 (4.1)	0.79	22.2 (3.6)	0.81
Negative professional identity	12.8	0.51	13.2 (1.9)	0.60	11.2 (3.3)	0.73
Positive professional identity	16.2	0.81	17.1 (2.1)	0.76	10.4 (2.2)	0.84
Roles & responsibilities	11.8	0.41	8.9 (1.7)	0.40	10.7 (2.3)	0.30
IEPS	59.8		59.9	0.84	62.5	0.90
Competency & autonomy	25.4	0.79	25.0 (2.4)	0.78	26.1 (3.5)	0.82
Perceived need for co-operation	10.7	0.21	9.8 (1.3)	0.38	10.2 (1.8)	0.41
Perception of Actual Cooperation	23.7	0.84	25.1 (2.6)	0.84	26.3 (3.5)	0.87

Note: Blank items indicate that data was not available. Total scores for each instrument are in bold print.

Procedures

General Overview

Three weeks after the initial questionnaires were found to be partially valid on this population of students, an email invitation was sent out to students that agreed to be a part of the second part of this study (Appendix D). A control group was used. A simple random sampling was performed to put half of the participants into the treatment group and half into the control group. For the control group, those participants were asked to complete the RIPLS and IEPS

with the additional questions regarding their perception of their choice of major. For the treatment group, they were asked to participate in an asynchronous online learning module, and then complete the questionnaire again (Appendix A).

Asynchronous Learning Module Design

The participants in the treatment group went through an online learning module to learn about interprofessionalism. The website contained four pages for the participant to go through. The first page contained the informed consent letter. If the participant agreed to be a part of the study, they were then taken to the home page of the module. The home page of the module contained 1) a brief written description of what IPE is, 2) why it is important to learn, and 3) directions on navigating and completing the module. The second page contained four short videos. The videos contained representatives of respiratory therapists, surgical technologists, radiologic technologists, and paramedics talking about their roles in healthcare and how they interact with different professions to provide patient care. The participant were instructed to watch all of the videos to help them develop their understanding of different career options and how different careers interact with each other. Lastly, the final page had a summary of IPE and a short case example of how professions work together to provide patient care. The final case example went through a case from the care of the first responders through to the emergency department, being hospitalized and finally through to discharge home. Each step of the way the case highlighted the different professions that worked with the patient and how these professions work together to achieve the same goal of better patient care. The design of this module was based on the design of McKenna et al. (2014) where they used explanations of IPE, videos showing the roles of different professions and how these professions worked together, and summarizing what they learned in a short case report.

The participant was then asked to complete the RIPLS and IEPS. The last questionnaire had two additional questions using a 6-point rating scale based on whether the IPE module had any effect on their major and career choice (Appendix A, part 3).

Statistical Analysis

Demographic information was collected at the beginning of the questionnaire. Age, sex, number of completed hours of prerequisite courses, previous experience with IPE, previous experience in healthcare, and major were all collected. Hinde et al. (2003) found that these factors, due to increasing their professional identity as they go through coursework, can have a negative impact on the effectiveness of an IPE module or experience.

Descriptive statistics were calculated based on major and experience with IPE. Paired T tests were used to compare the pre-intervention and post-intervention questionnaires for the overall mean and the means for each subscale based on each group. An analysis of covariance (ANCOVA) was used to compare the differences of the post-scores while controlling for the pre-scores.

4 RESULTS

Data Cleaning

The questionnaire was sent to 2190 students that met the inclusion criteria. 207 questionnaires were returned. The data were exported from Qualtrics to SPSS for analysis. The data were reviewed and twelve participants were removed due to only completing the demographics section. The RIPLS was completed by 195 participants, and the IEPS was completed by 184 participants. The response rate for the RIPLS was 8.9% and 8.4% for the IEPS.

RIPLS

Pre-Treatment Results

The RIPLS consists of four subscales. The negative professional identity subscale was reverse coded to create a unidirectional data analysis for the total RIPLS score. When the negative professional identity subscale was analyzed individually, the coding was not changed to have a more accurate representation of the participants. Table 8 summarizes the descriptive statistics for the RIPLS.

Table 8
Descriptive Statistics for the RIPLS

	Mean	Standard Deviation	Lowest Score	Highest Score
Total Score	50.2	5.6	39	68
Teamwork & collaboration	22.2	3.6	18	32
Negative professional identity	11.2	3.3	6	15
Positive professional identity	10.4	2.2	8	18
Roles & responsibilities	10.7	2.3	6	15

The RIPLS scores were compared with regards to anticipated majors (Table 9). If significant differences were noted between anticipated majors, this would have an effect on the interpretation of results and further statistical analysis may be warranted. Since registered nursing

was 52.8% of the sample population, the participants were grouped into two categories: non-nursing and registered nursing. An analysis of variance (ANOVA) was performed using the group membership as the independent variable and the RIPLS scores for the total and each subscale as the dependent variable. The ANOVA only revealed significance in the negative professional identity subscale ($F(1, 193) = 9.79, p = .002, \eta_p^2 = .048$) as seen in Table 10.

Table 9
Mean scores for RIPLS based on anticipated major

		Teamwork & Collaboration	Negative professional identity	Positive professional identity	Roles & responsibilities	Total
All Students	N = 195	22.2	11.2	10.4	10.7	50.2
Cardiovascular Technology	N = 1	22.0	15.0	11.0	11.0	47.0
Dental Assisting	N = 7	24.0	12.4	10.6	9.6	49.7
Diagnostic Medical Sonography	N = 30	21.7	11.7	10.5	11.1	49.7
Echocardiography	N = 2	24.0	10.5	12.0	11.0	54.5
Emergency Medical Technician	N = 2	21.5	13.5	9.0	12.5	47.5
Health Information Management	N = 4	24.3	11.3	10.3	10.3	51.5
Radiologic Technology	N = 16	22.9	12.7	10.9	11.2	50.3
Respiratory Care	N = 5	19.8	10.6	8.6	12.0	47.8
Surgical Technology	N = 12	23.3	11.8	10.0	10.8	50.3
Medical Assisting	N = 11	22.6	12.2	10.2	9.4	48.0
Certified Nursing Assistant	N = 2	22.0	10.5	10.0	8.5	48.0
Registered Nurse	N = 103	21.9	10.5	10.4	10.7	50.6

Table 10
Mean scores for RIPLS based on major group

		Teamwork & Collaboration	Negative professional identity	Positive professional identity	Roles & responsibilities	Total
All Students	N = 195	22.2	11.2	10.4	10.7	50.2
Non-nursing majors	N = 92	22.5	11.9	10.4	10.7	49.7
Nursing majors	N = 103	21.9	10.5	10.5	10.7	50.6
	F(1, 193)	1.143	9.79	.076	.001	1.476
	p	.286	.002	.783	.973	.226
	η_p^2	.006	.048	.000	.000	.008

Questionnaire results were also compared using the participant's previous experience with IPE in an educational (Table 11) and in a professional setting (Table 12). With regards to educational experience, there was no statistical difference seen at the $\alpha .05$ level and η_p^2 were all

at .029 or below. Comparing their professional experience, the only statistical significance was seen within the negative professional identity ($F(1,193) = 4.989, p = .027, \eta_p^2 = .025$).

Table 11
ANOVA results for RIPLS and previous educational experience with IPE

		Total	Teamwork & collaboration	Negative professional identity	Positive professional identity	Roles & responsibilities
Definitely Yes	N=47	22.2	10.7	10.8	10.9	51.3
Probably Yes	N=31	22.6	10.1	10.9	10.5	49.9
Might or Might Not	N=43	22.1	10.9	10.1	10.7	50.0
Probably Not	N=43	22.2	10.9	10.2	11.0	50.4
Definitely Not	N=31	21.8	11.5	10.0	10.5	48.7
	F(4,190)	.208	1.034	1.401	.483	1.021
	<i>p</i>	.934	.391	.235	.748	.398
	η_p^2	.004	.021	.029	.010	.021

Table 12
ANOVA results for RIPLS and previous professional experience with IPE

		Total	Teamwork & collaboration	Negative professional identity	Positive professional identity	Roles & responsibilities
Yes	N=80	22.4	10.8	10.8	10.6	51.1
No	N=115	22.0	11.4	10.1	10.8	49.5
	F(1, 193)	.595	1.773	4.989	.237	3.872
	<i>p</i>	.442	.185	.027	.627	.051
	η_p^2	.003	.009	.025	.001	.020

Post-Treatment Results

The means for the overall score and for the four subscales improved for the control and treatment group (Table 13). The only exception was in the control group where the mean for the roles and responsibilities had a 2.1point decrease. Within the test group, paired T tests showed a significant difference between the pre-treatment and post treatment scores in the total score ($t(10) = -10.794, p = <.001$), teamwork and collaboration ($t(10) = -14.157, p = <.001$), negative professional identity ($t(10) = 2.952, p = .014$), and positive professional identity ($t(10) = -3.911, p = .003$). The roles and responsibilities subscale did not show a significant difference ($t(10) = -$

1.936, $p = .082$). Within the control group, statistical significance was seen in the total score ($t(10) = -6.013$, $p < .001$), teamwork and collaboration ($t(10) = -5.844$, $p < .001$), negative professional identity ($t(10) = -6.728$, $p < .001$), and roles and responsibilities ($t(10) = 3.052$, $p = .010$). The positive professional identity subscale did not show a significant difference ($t(10) = -1.375$, $p = .194$).

Table 13
RIPLS descriptive statistics for the treatment and control group

	Control				Treatment			
	Pre-Mean	SD	Post-Mean	SD	Pre-Mean	SD	Post-Mean	SD
Total	50.9	5.2	75.8	10.4	46.9	5.1	83.2	7.7
Teamwork & collaboration	23.5	4.0	38.8	6.3	21.1	2.8	43.5	3.0
Negative professional identity	12.5	2.2	6.6	2.7	10.6	12.5	6.6	4.0
Positive professional identity	11.2	2.0	12.7	2.3	9.7	2.7	14.2	1.7
Roles & responsibilities	10.8	2.0	8.7	1.5	8.7	1.8	9.5	1.6

An one-way analysis of covariance was conducted to determine if there is a statistically significant difference between the treatment and control group on the subscale scores controlling for the pre-treatment subscale scores. There was no statistical difference seen between the control and the treatment group for the overall score or for any of the subscales. The roles and responsibilities subscale did have a large effect size ($F(1, 21) = 3.478$, $p = .076$, $\eta_p^2 = .142$). Table 14 lists the results of the ANCOVA

Table 14
ANCOVA results for RIPLS between the control and treatment group while controlling for the pre-treatment scores

	Total	Teamwork & collaboration	Negative professional identity	Positive professional identity	Roles & responsibilities
p	.412	.163	.616	.308	.076
$F(1, 21)$.701	2.087	.258	1.093	3.478
η_p^2	.032	.090	.012	.049	.142

IEPS

Pre-Treatment Results

The IEPS was compared in the same way that the RIPLS was. Comparisons were made between anticipated majors and educational and professional experience in IPE. Descriptive statistics can be found in Table 15.

Table 15
Descriptive Statistics for the IEPS

	Mean	Standard Deviation	Minimum Score	Maximum Score
Total Score	62.5	7.6	37	72
Competency & autonomy	26.1	3.5	12	30
Perceived need for cooperation	10.2	1.8	4	12
Perception of actual cooperation	26.3	3.5	14	30

The students were again grouped into nursing and non-nursing majors for analysis (Table 16 and 17). The ANOVA showed statistical significance in the perception of actual cooperation subscale ($F(1, 182) = 4.127, p = .044, \eta_p^2 = .022$).

Table 16
Means for IEPS and anticipated major

		Competency & autonomy	Perceived need for cooperation	Perception of actual cooperation	Total
All Students	N = 184 range	26.1 12-30	10.2 4-12	26.3 14-30	62.5 37-72
Cardiovascular Technology	N = 1	25.0	9.0	27.0	61.0
Dental Assisting	N = 7	24.7	9.7	25.7	60.1
Diagnostic Medical Sonography	N = 30	27.5	10.4	27.8	65.7
Echocardiography	N = 1	25.0	10.0	26.0	61.0
Emergency Medical Technician	N = 2	27.0	11.0	35.5	64.5
Health Information Management	N = 4	25.5	9.5	25.5	60.5
Radiologic Technology	N = 16	25.6	9.6	26.1	61.4
Respiratory Care	N = 4	29.5	11.8	30.0	71.3
Surgical Technology	N = 12	26.8	10.4	27.0	64.2
Medical Assisting	N = 9	23.9	9.2	23.9	57.0
Certified Nursing Assistant	N = 2	28.9	9.5	29.5	68.5
Registered Nurse	N = 96	25.8	10.3	25.8	61.8

Table 17
ANOVA results for IEPS and anticipated major

		Competency & autonomy	Perceived need for cooperation	Perception of actual cooperation	Total
All Students	N = 184	26.1	10.2	26.3	62.5
Non-nursing majors	N = 88	26.4	10.1	26.8	63.3
Nursing majors	N = 96	25.8	10.3	25.8	61.8
	F(1, 182)	1.522	.446	4.127	1.768
	p	.219	.505	.044	.185
	η_p^2	.008	.002	.022	.010

The ANOVA for previous educational and professional experience also did not show any statistical significance or large effect sizes as shown in Table 18 and 19.

Table 18
ANOVA results for IEPS and previous educational IPE experience

		Total	Competency & autonomy	Perceived need for cooperation	Perception of actual cooperation
Definitely Yes	N=45	26.1	10.5	26.6	63.2
Probably Yes	N=30	25.4	10.0	25.2	60.6
Might or Might Not	N=39	26.3	10.3	26.2	62.8
Probably Not	N=41	26.4	10.2	26.6	63.2
Definitely Not	N=29	26.2	9.6	26.5	62.3
	F(4, 179)	.430	1.350	.901	.670
	p	.787	.253	.464	.613
	η_p^2	.010	.029	.020	.015

Table 19
ANOVA results for IEPS and previous professional IPE experience

		Total	Competency & autonomy	Perceived need for cooperation	Perception of actual cooperation
Yes	N=78	25.8	10.0	25.9	62.2
No	N=106	26.3	10.2	26.5	62.9
	F(2, 181)	1.074	3.160	1.346	.338
	df	1	1	1	1
	p	.301	.077	.248	.562
	η_p^2	.006	.017	.007	.002

Post-Treatment Results

The means for the total and the three subscales changed very little between the pre- and post- scores as shown in Table 20. The means in the treatment group had a slight decrease in the

total score and two subscales, perceived need for cooperation and perception of actual cooperation. The means in the control group also had a decrease in the total and all of the subscales except for perceived need for cooperation in which there was no change in mean. Paired T tests were performed on the treatment and control group. For the treatment group, there were no significant differences between the pre- and post- scores in the total IEPS score ($t(10) = .087, p = .932$), competency and autonomy ($t(10) = -.536, p = .603$), perceived need for cooperation ($t(10) = .326, p = .751$), or in the perception of actual cooperation subscales ($t(10) = .216, p = .833$). The control group had similar results in the total score ($t(10) = .476, p = .643$), competency and autonomy ($t(10) = -1.046, p = .316$), perceived need for cooperation ($t(10) < .001, p = 1.00$), and in the perception of actual cooperation subscales ($t(10) = .188, p = .854$).

Table 20
IEPS descriptive statistics for the control and treatment group

	Control				Treatment			
	Pre- Mean	SD	Post- Mean	SD	Pre- Mean	SD	Post- Mean	SD
Total	59.9	7.8	58.9	6.0	66.3	5.6	66.1	8.2
Competency & Autonomy	25.5	3.1	24.8	2.8	27.4	2.8	27.7	4.4
Perceived need for cooperation	9.7	2.0	9.7	1.8	10.5	1.8	10.1	3.1
Perception of actual cooperation	24.7	3.9	24.5	3.2	28.5	1.9	28.3	2.6

An ANCOVA was performed using the group as the independent variable, the scores as the dependent variable, and the pre-scores as the covariate. Statistical significance was seen with the perceptions of actual cooperation subscale ($F(1, 21) = 4.616, p = .043, \eta_p^2 = .180$); the total score and other subscales were not found to be significant. The ANCOVA results are found in Table 21.

Table 21
ANCOVA results for IEPS between the control and treatment group while controlling for the pre-treatment scores

	Total	Competency & Autonomy	Perceived need for cooperation	Perception of actual cooperation
<i>p</i>	.170	.229	.833	.043
F(1, 21)	2.014	1.538	.045	4.616
η_p^2	.088	.068	.002	.180

Choice of majors

The last two questions on the post-treatment questionnaire were not asked in the pre-treatment questionnaire. The participants were asked about their feelings about keeping or changing their major on a 6-point Likert scale. The overall mean score for choosing the correct major was 5.62 with a standard deviation of 1.056. The test group had a mean of 5.36 (SD 1.502) and the control group had a mean of 5.85 (SD .376). The second question asked if they might consider changing their major and had an overall mean of 2.42 (SD 1.586). The treatment group had a mean of 2.27 (SD 1.954) and the control group had a mean of 2.54 (SD 1.266).

An ANOVA was performed using the group as the independent variable and the scores as the dependent variable. No statistical difference between the groups was observed. The question on having felt that they chose their correct major had a significance of $p = .274$ ($F(1,22) = 1.259$, $\eta_p^2 = .054$) and their consideration for changing their major had a significance of $p = .692$ ($F(1,22) = .161$, $\eta_p^2 = .007$).

5 DISCUSSION

Overview

This research was looking at the readiness of students in a technical college, enrolled in prerequisite courses, that were planning on entering into a health related field to learn about interprofessionalism in healthcare. This research took a group of students and administered a questionnaire and then randomly separated the group of respondents into a treatment and control group. The treatment group completed a short online course on IPE which they learned what IPE was, watched four videos about some different careers in health care and how they work with other professionals, and finally reading a case study showing the multiple different professions working together. After the course, the students then took a post-treatment questionnaire. The control group just took the post treatment questionnaire. The results were then analyzed using an ANCOVA controlling for the pre-treatment scores.

Question #1

The RIPLS was developed to determine if students were ready to embark in an interprofessional learning environment (Parsell & Bligh, 1999). The RIPLS is assessed by looking at the overall score as well as the scores of the four different subscales and how these scores change over time. Although there is no published data giving specific cut off scores that define the overall readiness of the students, it is generally accepted that the higher the scores, the more ready the students are. The only exception is with the negative professional identity subscale in which lower scores would indicate a higher sense of readiness.

The total RIPLS mean for the participants in the pre-treatment group (N= 195) was 50.2. This score is lower than other published data (McFadyen A. K., Webster, Maclaren, & O'Neill,

2010) (Wong, et al., 2016). This suggests that the participants may need to be better prepared before entering into an IPE curriculum. The total score included the subscales that could indicate where the students need more education and could help guide the IPE curriculum.

The participants need to have a better understanding of the teamwork involved with healthcare. Within the teamwork and collaboration subscale the participants were asked about how teamwork and collaboration can help them be better at their job as well as providing better patient care through understanding the roles of other professions. Their scores suggests that the participants do not understand how their profession works with others to achieve optimum patient care, nor do they have an understanding of how working in a collaborative environment can help achieve optimum patient care.

The participants also came into this study with a high score on the negative professional identity subscale. This subscale looks at how the student feels about working with other professions and how working with other professions can help them learn better clinical problem solving skills. Lower numbers for this subscale indicates better preparedness for this subscale. The mean for this subscale suggests that the students do not feel strongly that they need to work with other professions to either learn about how to practice medicine or to provide better patient care.

The positive professional identity subscale looks at the students feelings on how working with other professions will help them better communicate with patients and staff as well as their overall willingness to work with other professions. Again, the students entered into this study with a score that suggests that they would prefer working only within their own profession and do not see the benefit of working with others.

Lastly, the roles and responsibilities subscale looks at the students feelings regarding what the role of allied health careers are, their own professional role, and how much responsibili-

ties they have over other professions. This subscale was more comparable to other published data. Wong et al. (2016) had a mean 11.8 and McFadyen et al. (2010) had a mean 8.9. The participants in this study fell between these two studies with a mean of 10.7 (SD 2.3). Although still considered a low score, it is not expected to be high early in their education since the students are still learning about their career. This subscale has very weak internal consistency that has previously been attributed to a lack of experience (McFadyen, Maclaren, & Webster, 2007). This study cannot attribute the results to this. Over 65% of the students will be entering into their program the following semester. Although these students are not in a medical program yet, they are still interacting with other students that are pursuing a medical degree and they are also interacting with advisors that should help them build their understanding of their professional roles and responsibilities. King et al. (2012) had similar results where over half of their participants were nearly finished with their program and still showed weak internal consistency.

The post-treatment scores for the treatment group and the control group had a significant increase. Many authors have failed to report any significant increase in pre- and post scores over time (Oates & Davidson, 2015). The majority of these studies have been done on students that have already entered into their program of study that could indicate that they have already developed their professional identity and negative stereotypes of other professions. This early development of their professional identity could prevent the IPE from being successful and therefore not seeing a significant increase in post-treatment scores (Hind, et al., 2003).

The results of this study support much of the research about starting IPE early in their education. Looking at the results of the RIPLS in the pre-treatment scores, it suggests that these students did not see a value in working with other professions and did not see how their future profession fit into the healthcare team. It is common practice for students in prerequisite

courses to gravitate to other students applying for the same major creating an educational silo very quickly. This leads to a group of students that begin their professional socialization very early. The early professional socialization creates profession-centrism, which creates negative stereotypes of other professions and creates a culture of competition between healthcare professions (Pecukonis et al., 2008). Early adoption of IPE will help prevent the formation of negative stereotypes and will help promote teamwork between professions (Areskog, 1988, Carpenter, 1995, Parsell et al., 1998, Horder, 1995). Despite the low scores in the pre-treatment group, the increase in scores for the post-treatment group suggest that these students are ready to enter into an IPE curriculum based on the marked increase of scores. The lack of significant differences in scores for the different majors in all of the subscales except negative professional identity also suggests that students from all disciplines are ready for an IPE curriculum. One interesting finding in this study showed a significant difference in the negative professional identity subscale for the group of students that had previous professional experience. Their scores were lower when compared to those that did not have any previous professional experience in the medical field. Other studies have found opposite results and have attributed those results to the student having a more realistic view of their own profession's interactions in a clinical setting (Pollard, Miers, Gilchrist, & Sayers, 2006). This result would be expected if the students' previous professional experience was in a setting that emphasized and had a cultural focus on interprofessional practices, however this study did not gather any data that would help clarify their experience beyond their job title so further understanding of this result is impossible.

Question #2

The second question in this study asks if the student's understanding of the importance of collaboration in healthcare and education was improved after a short lesson in IPE. The results

showed that the students in the treatment group and the control group did not score a significant difference between the pre- and post-treatment scores except for the perception of actual cooperation subscale in which the scores actually worsened. The videos that they watched highlighted four different careers with a focus on how they work with other health professions.

The students in the treatment group may not have seen an increase in their scores because they may not have enough baseline knowledge of their future career or other careers to understand what they have learned. The IECEP (2011) states that all IPE programs must start off with teaching ethics and values as well as the roles and responsibilities of health careers. Without this baseline knowledge, putting students into an IPE lesson could have a negative impact on their gaining of knowledge and understanding of the importance of IPE (Hind, et al., 2003). Based on the RIPLS scores, these students did not have that baseline knowledge to be able to get the full benefit of this online module. Although their RIPLS scores did improve afterwards, this just suggests that they are better prepared to continue in an IPE curriculum.

The module that they completed was very short, only taking an expected 30-45 minutes to complete. This short module could have had an effect on the outcome of this study. Due to these reasons, this research question could not be answered.

Implications

The results of this study leads to several implications at the organizational and individual level. This study shows that students taking prerequisite courses for a career track may not know very much about their career in terms of how they work with other professions and their specific role in the healthcare team. It is important that students learn everything that they can about their future career before being too invested in time and money taking courses for something that they may not enjoy or that may not fit their professional goals. The institution should include IPE in

their curriculum focusing on teaching the roles and responsibilities of healthcare careers as early as possible. This will help the students understand their role in healthcare as well as the roles of other careers.

The institutions should also determine how they are going to incorporate teamwork in the classroom so that the teams that are working together include people from several different majors. Even as early as their prerequisite courses, students tend to gravitate towards other students that will be entering into the same field. Therefore the silo of education gets created very early. As suggested by Hoffman and Harnish (2007), the silos cannot be prevented, but the instructors can still promote IPE by creating group projects that are designed to require different majors working together and getting them to learn about each other, from each other.

Lastly, the institution should focus on roles and responsibilities during advisement sessions. Despite having a weak understanding of their roles and responsibilities, the participants were very confident in their choice of major and were not likely going to change. Many students will meet with advisors prior to registering for prerequisite classes and will continue meeting with advisors throughout their education. During these advisement sessions, conversations about their chosen careers as well as other careers should be discussed. These conversations should help improve the student's understanding of the different careers to help them make the best decision for their future.

These two strategies could ultimately prepare the student to work in a collaborative working environment as well as teach them the values of other professions further preventing the creation of negative stereotypes. These strategies may also help the student confirm that they are in the correct major track. If they are not, they will have decided this early and would have time to pick a different major. Also, by starting the IPE curriculum early, they will be better prepared

when they get accepted into their program of study and into their clinical rotations. They will have a higher sense of professional identity and have a better understanding of their role and the roles of others as it relates to teamwork and providing optimal patient care.

Limitations

This study had several limitations. First, there was less than a 10% response rate with the initial questionnaire. The interpretation of the results excluded over 90% of the population and therefore made the assumptions difficult at best. Low response rates introduce bias and threaten the validity of the results of the study (Glidewell, et al., 2012). It has also been found that women respond more frequently than men (Lin, Hewitt, & Videras, 2017). Since women dominate this population, having a lower response from the few males that meet the inclusion criteria could have an effect. Lin, Hewitt, and Videras (2017) also found that higher grade point averages predict higher response rates. This bias does not give a voice to the students that may be struggling academically or are simply average students. The assumptions being made about this population is being made based on the higher performing students. This study is also restricted to just one population of students in one geographic location. Curriculum and institutional mandates vary in the various regions of the United States and these results are limited to just this one specific college and population of students. Lastly, limitations with the questionnaires should be noted. The participants were from a wide range of professional and educational programs that ranged from two semester diploma programs to Associate degree programs. Some of the participants were licensed medical professionals continuing their education and others were taking their first semester of prerequisite courses. This wide range of participants made it difficult for some to complete the questionnaire.

Suggestions for Further Research

The results of the RIPLS were surprising. The participants scored very low in the pre-treatment, however the control and treatment group had a drastic increase for the post-treatment scores without a significant difference between the two groups. There are several possible reasons for this. First, it is possible that the students were talking about IPE after the initial questionnaire and could have done some independent research on the topic which would have been evident with their increase in scores independent of the module the treatment group completed. Previous discussion in this study highlight how students form silos in education where students of the same career track will gravitate towards each other. Secondly, there could have been problems with the data set. The data was exported from Qualtrics to SPSS, and then the scores had to be reversed coded. In that process an error could have occurred. However, to determine if this was a problem, the researcher performed the entire process of exporting and recoding twice with identical results. Thirdly, since there are no published papers validating or using the RIPLS in this population of student, it may not be the best instrument to use. Although the Cronbach alpha scores were mostly acceptable and consistent with what has been published, the researcher did get several comments through email that the participants did not complete the questionnaire because they did not understand the questions. King et al. (2012) found this to be a limitation of their study performed on a cross-institutional design. Further research should look at validating this instrument in this population of student to assess if it is acceptable. Further work on the instrument itself with a focus on language and inclusiveness of the wide range of majors and students that this instrument is used on.

Further research should also look at this population of student at different colleges throughout the country as well as looking at different professional tracks. These research pro-

jects should consider more data to help determine where in their educational track they are and specifics of their previous history with IPE in the educational or professional setting. Qualitative data can give further details on the extent and type of previous professional and educational experience the students have. Further research should also acquire some qualitative data to get a better idea of how much these students know about their career and teamwork in the healthcare setting. Lastly, further research projects should look at the best ways of instituting IPE in the curriculum at such an early stage in the educational program.

REFERENCES

- Accreditation Commission for Education in Nursing. (2015). *Report to Constituents*. Atlanta: ACEN.
- Areskog, N. (1988). The need for multiprofessional health education in undergraduate studies. *Medical Education* , 22, 251-252.
- Ateah, C. A., Snow, W., Wener, P., MacDonald, L., Metge, C., Davis, P. et al. (2011). Stereotyping as a barrier to collaboration: Does interprofessional education make a difference? *Nurse Education Today* , 208-213.
- Bainbridge, L. (2014). Interprofessional education in allied health: is this yet another silo? *Medical Education* , 48, 225-233.
- Barnsteiner, J. H., Disch, J. M., Hall, L., Mayer, D., & Moore, S. M. (2007). Promoting interprofessional education. *Nursing Outlook* , 144-150.
- Barr, H. (1998). Competent to collaborate: towards a competency-based model for interprofessional education. *Journal of Interprofessional Care* , 181-187.
- Barr, H. (2002). *Interprofessional education today, yesterday, and tomorrow*. London: Learning and Teaching Support Network Centre for Health Sciences and Practice.
- Bolesta, S., & Chmil, J. V. (2014). Interprofessional education among student health professionals using human patient simulation. *American Journal of Pharmaceutical Education* , 78 (5), 1-9.
- Bureau of Labor Statistics, U.S. Department of Labor. (n.d.). *Occupational Outlook Handbook 2016-2017*. Retrieved November 6, 2016, from Bureau of Labor Statistics: www.bls.gov/ooh

CAIPE. (2006). CAIPE reissues its statement of the definition and principles of interprofessional education. *CAIPE Bulliten 26* .

Carpenter, J. (1995). Doctors and nurses: stereotype and stereotype change in interprofessional education. *Journal of Interprofessional Care* , 151-161.

Carpenter, J. (1995). Interprofessional education for medical and nursing students: a evaluation of a programme. *Medical Education* , 265-272.

Clouder, D. L. (2008). Technology-enhanced learning: Conquering barriers to interprofessional education. *The Clinical Teacher* , 5, 198-202.

Commission on Accreditation for Respiratory Care. (2017). *2016 Report on Accreditation in Respiratory Care Education*. Bedford: COARC.

Commission on Accreditation of Allied Health Education Programs. (2017, September). *Find a Program*. Retrieved September 8, 2017, from CAAHEP:
<https://www.caahep.org/Students/Find-a-Program.aspx>

Cooper, H., Spencer-Dawe, E., & McLean, E. (2005). Beginning the process of teamwork: Design, implementation, and evaluation of an inter-professional education intervention for first year undergraduate students. *Journal of Interprofessional Care* , 19 (5), 492-508.

D'Amour, D., & Oandasan, I. (2005, May). Interprofessionality as the field of interprofessional practice and interprofessional education: An emerging concept. *Journal of Interprofessional Care* , 8-20.

Davis, B., & Sumara, D. (2010). "If things were simple...": complexity in education. *Journal of Evaluation in Clinical Practice* , 16, 856-860.

Davis, B., & Sumara, D. (2006). *Complexity and education*. Marwah, NJ: Lawrence Erlbaum.

Department of Health. (2000). *A Health service of all the talents: developing NHS workforce*. London: Department of Health.

Derbyshire, J. A., & Machin, A. I. (2011). Learning to work collaboratively: Nurses' views of their pre-registration interprofessional education and its impact on practice. *Nurse Education in Practice* , 11, 239-244.

Evans, S., Knight, T., Sonderlund, A., & Tooley, G. (2014). Facilitators' experience of delivering asynchronous and synchronous online interprofessional education. *Medical Teacher* , 36, 1051-1056.

Finch, J. (2000). Interprofessional education and teamworking: a view from the education providers. *British Medical Journal* , 1138-1140.

Forte, A., & Fowler, P. (2009). Participation in interprofessional education: An evaluation of student and staff experiences. *Journal of Interprofessional Care* , 58-66.

Freeth, D., Hammick, M., Koppel, I., Reeves, S., & Barr, H. (2002). *A critical review of evaluations of interprofessional education*. London: Learning and Teaching Support Network Centre for Health Sciences and Practice.

General Medical Council. (1993). *Tomorrow's doctors: recommendations on undergraduate medical education*. London: General Medical Council.

Glidewell, L., Thomas, R., MacLennan, G., Bonetti, D., Johnston, M., Eccles, M. P. et al. (2012). Do incentives, reminders or reduced burden improve healthcare professional response rate in postal questionnaires? two randomised controlled trials. *BMC Health Services Research* , 12 (250).

Hamilton, J. (2011). Two birds with one stone: Addressing interprofessional education aims and objectives in health profession curricula through interdisciplinary cultural competency training. *Medical Teacher* , 199-203.

Hammick, M., Freeth, D., Koppel, I., Reeves, S., & Barr, H. (2007). A best evidence systematic review of interprofessional education: BEME guide no. 9. *Medical Teacher* , 29, 735-751.

Hind, M., Norman, I., Cooper, S., Gill, E., Hilton, R., Judd, P. et al. (2003). Interprofessional perceptions of health care students. *Journal of Interprofessional Care* , 17, 21-34.

Hoffman, S. J., & Harnish, D. (2007). The merit of mandatory interprofessional education for pre-health professional students. *Medical Teacher* , 29, 235-242.

Horder, J. (1995). Interprofessional education for primary health and community care: Present state and future needs. In K. Soothill, L. Mackay, & C. Webb, *Interprofessional Relations in Health Care*. London: Arnold.

Interprofessional Education Collaborative Expert Panel. (2011). *Core competencies for interprofessional collaborative practice: Report of an expert panel*. Washington, D.C.: Interprofessional Education Collaborative.

Jakobsen, F., Hansen, T. B., & Eika, B. (2011). Knowing more about the other professions clarified my own profession. *Journal of Interprofessional Care* , 25, 441-446.

Joint Review Committee on Education in Radiologic Technology. (2016). *Organizational report of the JRCERT*. Chicago: JRCERT.

Kahaleh, A. A., Danielson, J., Franson, K. L., Nuffer, W. A., & Umland, E. M. (2015). An interprofessional education panel on development, implementation, and assessment strategies. *American Journal of Pharmaceutical Education* , 79 (6), 1-10.

King, S., Greidanus, E., Major, R., Loverso, T., Knowles, A., Carbonaro, M. et al. (2012). A cross-institutional examination of readiness for interprofessional learning. *Journal of Interprofessional Care* , 26, 108-114.

Knebel, E. (2001). *The use and effect of distance education in healthcare: What do we know*. U.S. Agency for International Development. Bethesda: Quality Assurance Project.

Lapkin, S., Levett-Jones, T., & Gilligan, C. (2013). A systematic review of the effectiveness of interprofessional education in health professional programs. *Nurse Education Today* , 33, 90-102.

Lin, W.-F., Hewitt, G., & Videras, J. (2017). 'I'm meliiiiiiiiing...': The decline of response rates and the impact of nonresponse bias on the results of national surveys at small colleges. *New Directions for Institutional Research* , 2017 (173), 51-62.

Lindquist, S., Duncan, A., Shepstone, L., Wats, F., & Pearce, S. (2005). Case-based learning in cross-professional groups- the development of a pre-registration interprofessional learning programme. *Journal of Interprofessional Care* , 19 (5), 509-520.

Luecht, R. M., Madsen, M. K., Taugher, M. P., & Petterson, B. J. (1990). Assessing professional perceptions: Design and validation of an interdisciplinary education perception scale. *Journal of Allied Health* , 19 (2), 181-191.

Maharajan, M. K., Rajiah, K., Khoo, S. P., Chellappan, D. K., De Alwis, R., Chui, H. C. et al. (2017). Attitudes and readiness of students of healthcare professions towards interprofessional learning. *PLoS ONE* , 12 (1), 1-12.

Mandy, A., Milton, C., & Mandy, P. (2004). Professional stereotyping and interprofessional education. *Learning in Health and Social Care* , 3, 154-170.

Mann, K. V., McFetridge-Durdle, J., Martin-Misener, R., Clovis, J., Rowe, R., Beanlands, H. et al. (2009). Interprofessional education for students of the health professions: The "Seamless Care" model. *Journal of Interprofessional Care* , 23 (3), 224-233.

McFadyen, A. K., Maclaren, W. M., & Webster, V. S. (2007). The interdisciplinary education perception scale (IEPS): An alternative remodelled sub-scale structure and its reliability. *Journal of Interprofessional Care* , 21 (4), 433-443.

McFadyen, A. K., Webster, V. S., Maclaren, W. M., & O'Neill, M. A. (2010). Interprofessional attitudes and perceptions: Results from a longitudinal controlled trial of pre-registration health and social care students in Scotland. *Journal of Interprofessional Care* , 24 (5), 549-564.

McFadyen, A. K., Webster, V., Strachan, K., Figgins, E., Brown, H., & McKechnie, J. (2005). The readiness for interprofessional learning scale: A possible more stable sub-scale model for the original version of RIPLS. *Journal of Interprofessional Care* , 19, 595-603.

McKenna, L., Boyle, M., Palermo, C., Molloy, E., Williams, B., & Brown, T. (2014). Promoting interprofessional understanding through online learning: A qualitative examination. *Nursing and Health Sciences* , 16, 321-326.

McMurtry, A. (2010). Complexity, collective learning and the education of interprofessional health teams: Insights from a university-level course. *Journal of Interprofessional Care* , 24 (3), 220-229.

Mitchell, B. S., McCrorie, P., & Segwick, P. (2004). Student attitudes towards anatomy teaching and learning in a multiprofessional context. *Medical Education* , 737-748.

Moran, M. C., Steketee, C., Forman, D., & Dunston, R. (2015). Using a research-informed interprofessional curriculum framework to guide reflection and future planning of interprofessional education in a multi-site context. *Journal of Research in Interprofessional Practice and Education* , 5.1, 1-13.

Murray-Davis, B., Marshall, M., & Gordon, F. (2012). From school to work: Promoting the application of pre-qualification interprofessional education in the clinical workplace. *Nurse Education in Practice* , 12, 289-296.

Myers, C. T., & O'Brien, S. P. (2015). Teaching interprofessional collaboration: Using online education across institutions. *Occupational Therapy in Health Care* , 29 (2), 178-185.

National League for Nursing. (2014). *Annual Survey of Schools of Nursing*. Washington DC: NLN.

Nitz, J., Davidson, B., McGuire, T., & Fox-Young, S. (2013). Case-based interprofessional education: An evaluation of students' learning experiences. *Focus on Health Professional Education: A Multi-Disciplinary Journal* , 15 (1), 25-35.

Oates, M., & Davidson, M. (2015). A critical appraisal of instruments to measure outcomes of interprofessional education. *Medical Education* , 49, 386-398.

Olson, R. E., Klupp, N., & Astell-Burt, T. (2016). Reimagining health professional socialisation: an interactionist study of interprofessional education. *Health Sociology Review* , 92-107.

Parsell, G., & Bligh, J. (1999). The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). *Medical Education* , 33, 95-100.

Parsell, G., Spalding, R., & Bligh, J. (1998). Shared goals, shared learning: evaluation of a multiprofessional course for undergraduate students. *Medical Education* , 304-311.

Pecukonis, E., Doyle, O., & Bliss, D. L. (2008). Reducing barriers to interprofessional training: Promoting interprofessional cultural competence. *Journal of Interprofessional Care* , 417-428.

Petrie, H. (1976). Do you see what I see? The Epistemology of interdisciplinary inquiry. *Journal of Aesthetic Education* , 10, 29-43.

Pollard, K., Miers, M., Gilchrist, M., & Sayers, A. (2006). A comparison of interprofessional working relationships among health and social care students: The results of a 3-year intervention. *Health and Social Care in the Community* , 14, 541-552.

Price, S., Doucet, S., & McGillis Hall, L. (2014). The historical social positioning of nursing and medicine: Implications for career choice, early socialization, and interprofessional collaboration. *Journal of Interprofessional Care* , 103-109.

Ryan, A., & McKenna, H. (1994). A comparative study of the attitudes of nursing and medical students to aspects of patient care and the nurse's role in organizing care. *Journal of Advanced Nursing* , 114-123.

Sander, O., Schmidt, R., Rehkemper, G., Logters, T., Zilkens, C., & Schneider, M. (2016). Interprofessional education as part of becoming a doctor or physiotherapist in a competency-based curriculum. *Journal for Medical Education* , 33 (2), 1-22.

Thistlethwaite, J. (2012). Interprofessional education: a review of context, learning, and the research agenda. *Medical Education* , 46, 58-70.

Tunstall-Pedoe, S., Rink, E., & Hilton, S. (2003). Student attitudes to undergraduate interprofessional education. *Journal of Interprofessional Care* , 17 (2), 161-172.

Wamsley, M., Staves, J., Kroon, L., Topp, K., Hossaini, M., Barbara, N. et al. (2012). The Impact of an interprofessional standardized patient exercise on attitudes toward working in interprofessional teams. *Journal of Interprofessional Care* , 26, 28-35.

West, A., Miller, S., & Leitch, J. (2016). Professional socialization and attitudes towards interprofessional collaboration among graduate social work and health professions students. *Advances in Social Work* , 134-150.

Wong, R. L., Fahs, D. B., Talwalker, J. S., Colson, E. R., Desai, M. M., Kayingo, G. et al. (2016). A longitudinal study of health professional students' attitudes towards interprofessional education at an American university. *Journal of Interprofessional Care* , 30 (2), 191-200.

World Health Organization. (2010). *Framework for action on interprofessional education & collaborative practice*. Geneva: World Health Organization.

APPENDICES

Appendix A

Questionnaires

Please complete all parts to this questionnaire. Both parts should take approximately 10-15 minutes:

Develop your own personal code to maintain confidentiality by using the following formula:

First 3 letters of your mother's first name + Last 3 letters of your last name + 2 digit day of your birth

How old are you?

What is your sex?

How many prerequisite courses have you completed?

Do you have any previous experience with interprofessional education?

Do you have any professional experience working in the healthcare system?

If so, what professional experience did you have?

What is your anticipated major?

Part 1:

		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.	Learning with other students will make me a more effective member of a health care team.					
2.	Patients would ultimately benefit if health care students worked together to solve patient problems.					
3.	Shared learning with other health care students will increase my ability to understand clinical problems.					
4.	Learning with health care students before qualification would improve working relationships after qualification.					
5.	Communication skills should be learned with other health care students.					
6.	Shared learning will help me to think positively about other health care professionals.					
7.	For small-group learning to work, students need to respect and trust each other.					

8.	Team-working skills are essential for all health care students to learn.					
9.	Shared learning will help me to understand my own limitations.					
10.	I don't want to waste time learning with other health care students.					
11.	It is not necessary for undergraduate health care students to learn together.					
12.	Clinical problem solving skills can only be learned with students from my own department.					
13.	Shared learning with other health care students will help me to communicate better with patients and other professionals.					
14.	I would welcome the opportunity to work on small group projects with other health care students.					
15.	Shared learning will help to clarify the nature of patient problems.					
16.	Shared learning before qualification will help me become a better team worker.					
17.	The function of allied health professionals is mainly to provide support for doctors.					
18.	I am not sure what my professional role will be.					
19.	I have to acquire much more knowledge and skills than other health care students.					

Part 2:

		Strongly Agree	Moderately Agree	Somewhat Agree	Somewhat Disagree	Moderately Disagree	Strongly Disagree
1.	Individuals in my profession are well trained.						
2.	Individuals in my profession are able to work closely with individuals in other professions.						
3.	Individuals in my profession are very positive about their goals and objectives.						
4.	Individuals in my						

	profession need to cooperate with other professions.						
5.	Individuals in my profession are very positive about their contributions and accomplishments.						
6.	Individuals in my profession must depend upon the work of people in other professions.						
7.	Individuals in my profession trust each other's professional judgment.						
8.	Individuals in my profession are extremely competent.						
9.	Individuals in my profession are willing to share information and resources with other professionals.						
10.	Individuals in my profession have good relations with people in other professions.						
11.	Individuals in my profession think highly of other related professions.						
12.	Individuals in my profession work well with each other.						

Part 3: Completed after finishing the IPE module

		Strongly Agree	Moderately Agree	Somewhat Agree	Somewhat Disagree	Moderately Disagree	Strongly Disagree
1.	After completing the module on IPE, I feel that I have chosen the correct major.						

2.	After completing the module on IPE, I may consider changing my major.						
----	---	--	--	--	--	--	--

Appendix B

Informed Consent: Pre-Treatment

Georgia State University

Informed Consent

Title: An Examination of Pre-Major Health Student's Readiness for Interprofessional Education at a Technical College

Principal Investigator: Dr. Brendan Calandra

Student Principal Investigator: Ryan Cheek

Purpose

You are invited to participate in a research study. The purpose of the study is to validate a questionnaire used in interprofessional education research, and to measure the readiness and effectiveness of interprofessional education on prerequisite students in allied health majors. You are invited to participate because you are currently enrolled in a prerequisite course in an allied health major. Participation will require 10-15 minutes of your time. This research should be completed in a single setting. Up to 3500 participants will be accepted for this study

Procedures

If you decide to participate, you will be asked to complete the questionnaire that will take approximately 10-15 minutes. This research will be completed through a website so participation can occur wherever you have Internet access and will occur within a 2 week period, (dates TBD). One month after completing the questionnaire, you will be invited to participate in the second part of this research where you will randomly be put into either an intervention group or a control group. At the time of the invitation, you will again read and agree to an informed consent letter that will explain the second part of this research.

Future Research

Researchers may use your data for future research. If we do this, we will not ask for any additional consent for you.

Risks

In this study, you will not have any more risks than you would in a normal day of life.

Benefits

Participation in this study may not benefit you personally. Overall, we hope to gain information about diploma and Associate degree student's ability to participate in and learn from an interprofessional education exercise. If this research shows that these surveys are a valid instrument to

use on diploma and Associate degree pre-major allied health students, it could lead to their use in further research studies that could affect the curriculum of pre-requisite courses.

Alternatives

The alternative to taking part in this study is to not take part in the study.

Voluntary Participation and Withdrawal

You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop participating at any time.

You may refuse to take part in the study or stop at any time, this will not cause you to lose any benefits to which you are otherwise entitled.

Confidentiality

We will keep your records private to the extent allowed by law. The following people and entities will have access to the information you provide:

- Dr. Brendan Calandra and Ryan Cheek
- GSU Institutional Review Board
- Office for Human Research Protection (OHRP)

We will use the personal code that you create rather than your name on study records. The information you provide will be stored on a password-protected computer and your personal code will be destroyed after the research project is complete. Although we will make every effort to protect confidentiality, data sent over the Internet may not be secure. The findings will be summarized and reported in group form. You will not be identified personally.

When we present or publish the results of this study, we will not use your name or other information that may identify you.

Contact Information

Contact Dr. Brendan Calandra at 404-413-8420 or bcalandra@gsu.edu or Ryan Cheek at 678-549-9634 or rcheek2@student.gsu.edu

- If you have questions about the study or your part in it
- If you have questions, concerns, or complaints about the study

Contact the GSU Office of Human Research Protections at 404-413-3500 or irb@gsu.edu

- if you have questions about your rights as a research participant
- if you have questions, concerns, or complaints about the research

Gwinnett Technical College has approved this research in support of the researcher's doctoral studies. Gwinnett Tech, however, has had no involvement with the questions or administering of the questions involved in the study. Should you, as a Gwinnett Tech student, have any questions or concerns about the study, you may contact the researcher's dissertation chair

(Dr. Brendan Calandra, bcalandra@gsu.edu) or the Gwinnett Tech contact (Dr. Carla Morelon, cmorelon@GwinnettTech.edu).

Consent

If you are willing to participate in this research, please click the 'Continue' button below to begin the survey.

A copy of this consent form can be printed for your records.

Appendix C

Informed Consent: Online Module

Georgia State University
Informed Consent

Title: An Examination of Pre-Major Health Student's Readiness for Interprofessional Education at a Technical College

Principal Investigator: Dr. Brendan Calandra

Student Principal Investigator: Ryan Cheek

Purpose

Previously you were invited to participate in the first part of this study where we asked you to help us validate a questionnaire on interprofessional education. Now you are being invited to participate in the second part of this research study. The purpose of the study is to investigate if students taking prerequisite courses in an allied health major are ready to participate in interprofessional education. You are invited to participate because you are currently enrolled in a prerequisite course in an allied health major. A total of 3500 participants will be recruited for this study. Participation will require 40-55 minutes of your time. This research can be completed in a single setting, or can be completed over multiple settings as your time allows.

Procedures

Participants were randomly split into an intervention group and a control group. You will complete an online module that introduces you to interprofessional education and different careers in allied health; this will take approximately 30-40 minutes. After the completion of the module, you will complete a questionnaire that will take approximately 10-15 minutes and give the researchers information about what you have learned from the online module. This research will be completed through a website so participation can occur wherever you have Internet access and will occur within a 2 week period, (dates TBD).

Future Research

Researchers will remove your personal code and may use your data for future research. If we do this, we will not ask for any additional consent for you.

Risks

In this study, you will not have any more risks than you would in a normal day of life.

Benefits

Participation in this study may not benefit you personally. Overall, we hope to gain information about diploma and Associate degree student's ability to participate in and learn from an interprofessional education exercise. If this research shows that these surveys are a valid instrument to use on diploma and Associate degree pre-major allied health students, it could lead to their use in further research studies that could affect the curriculum of pre-requisite courses.

Alternatives

The alternative to taking part in this study is to not take part in the study.

Voluntary Participation and Withdrawal

You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop participating at any time. You may refuse to take part in the study or stop at any time, this will not cause you to lose any benefits to which you are otherwise entitled.

Confidentiality

We will keep your records private to the extent allowed by law. The following people and entities will have access to the information you provide:

- Dr. Brendan Calandra and Ryan Cheek
- GSU Institutional Review Board
- Office for Human Research Protection (OHRP)

We will use the personal code that you create rather than your name on study records. The information you provide will be stored on a password-protected computer and your personal code will be destroyed after the research project is complete. Although we will make every effort to protect confidentiality, data sent over the Internet may not be secure. The findings will be summarized and reported in group form. You will not be identified personally.

When we present or publish the results of this study, we will not use your name or other information that may identify you.

Contact Information

Contact Dr. Brendan Calandra at 404-413-8420 or bcalandra@gsu.edu or Ryan Cheek at 678-549-9634 or rcheek2@student.gsu.edu

- If you have questions about the study or your part in it
- If you have questions, concerns, or complaints about the study

Contact the GSU Office of Human Research Protections at 404-413-3500 or irb@gsu.edu

- if you have questions about your rights as a research participant
- if you have questions, concerns, or complaints about the research

Gwinnett Technical College has approved this research in support of the researcher's doctoral studies. Gwinnett Tech, however, has had no involvement with the questions or administering of the questions involved in the study. Should you, as a Gwinnett Tech student, have any questions or concerns about the study, you may contact the researcher's dissertation chair (Dr. Brendan Calandra, bcalandra@gsu.edu) or the Gwinnett Tech contact (Dr. Carla Morelon, cmorelon@GwinnettTech.edu).

Consent

If you are willing to participate in this research, please click the 'Continue' button below to begin.

A copy of this consent form can be printed for your records.

Appendix D

Informed Consent: Control Group

Georgia State University

Informed Consent

Title: An Examination of Pre-Major Health Student's Readiness for Interprofessional Education at a Technical College

Principal Investigator: Dr. Brendan Calandra

Student Principal Investigator: Ryan Cheek

Purpose

Previously you were invited to participate in the first part of this study where we asked you to help us validate a questionnaire on interprofessional education. Now you are being invited to participate in the second part of this research study. The purpose of the study is to investigate if students taking prerequisite courses in an allied health major are ready to participate in interprofessional education. You are invited to participate because you are currently enrolled in a prerequisite course in an allied health major. A total of 3500 participants will be recruited for this study. Participation will require 10-15 minutes of your time. This research should be completed in a single setting.

Procedures

Participants were randomly split into an intervention group and a control group. If you decide to participate, you will be asked to complete a questionnaire that will take approximately 10-15 minutes and give the researchers information about what you have learned about interprofessional education. This research will be completed through a website so participation can occur wherever you have Internet access and will occur within a 2 week period, (dates TBD).

Future Research

Researchers will remove your personal code and may use your data for future research. If we do this, we will not ask for any additional consent for you.

Risks

In this study, you will not have any more risks than you would in a normal day of life.

Benefits

Participation in this study may not benefit you personally. Overall, we hope to gain information about diploma and Associate degree student's ability to participate in and learn from an interprofessional education exercise. If this research shows that these surveys are a valid instrument to use on diploma and Associate degree pre-major allied health students, it could lead to their use in further research studies that could affect the curriculum of pre-requisite courses.

Alternatives

The alternative to taking part in this study is to not take part in the study.

Voluntary Participation and Withdrawal

You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop participating at any time. You may refuse to take part in the study or stop at any time, this will not cause you to lose any benefits to which you are otherwise entitled.

Confidentiality

We will keep your records private to the extent allowed by law. The following people and entities will have access to the information you provide:

- Dr. Brendan Calandra and Ryan Cheek
- GSU Institutional Review Board
- Office for Human Research Protection (OHRP)

We will use the personal code that you create rather than your name on study records. The information you provide will be stored on a password-protected computer and your personal code will be destroyed after the research project is complete. Although we will make every effort to protect confidentiality, data sent over the Internet may not be secure. The findings will be summarized and reported in group form. You will not be identified personally.

When we present or publish the results of this study, we will not use your name or other information that may identify you.

Contact Information

Contact Dr. Brendan Calandra at 404-413-8420 or bcalandra@gsu.edu or Ryan Cheek at 678-549-9634 or rcheek2@student.gsu.edu

- If you have questions about the study or your part in it
- If you have questions, concerns, or complaints about the study

Contact the GSU Office of Human Research Protections at 404-413-3500 or irb@gsu.edu

- if you have questions about your rights as a research participant
- if you have questions, concerns, or complaints about the research

Gwinnett Technical College has approved this research in support of the researcher's doctoral studies. Gwinnett Tech, however, has had no involvement with the questions or administering of the questions involved in the study. Should you, as a Gwinnett Tech student, have any questions or concerns about the study, you may contact the researcher's dissertation chair

(Dr. Brendan Calandra, bcalandra@gsu.edu) or the Gwinnett Tech contact (Dr. Carla Morelon, cmorelon@GwinnettTech.edu).

Consent

If you are willing to participate in this research, please click the 'Continue' button below to begin.

A copy of this consent form can be printed for your records.

Appendix E

Recruitment Letters

Recruitment Letters

A copy of the Informed Consent form will be attached to each recruitment letter in addition to the following statement:

Gwinnett Technical College has approved this research in support of the researcher's doctoral studies. Gwinnett Tech, however, has had no involvement with the questions or administering of the questions involved in the study. Should you, as a Gwinnett Tech student, have any questions or concerns about the study, you may contact the researcher's dissertation chair (Dr. Brendan Calandra, bcalandra@gsu.edu) or the Gwinnett Tech contact (Dr. Carla Morelon, cmorelon@GwinnettTech.edu).

Validation Study

You are being invited to participate in a research study through Georgia State University. The researchers of this study are seeking individuals that are high school graduates enrolled in prerequisite courses for entry into allied health programs at Gwinnett Technical College. The purpose of the study is to validate a questionnaire used in interprofessional education research, and to measure the readiness and effectiveness of interprofessional education on prerequisite students in allied health majors. Participation in this study may not benefit you personally. Overall, we hope to gain information about diploma and Associate degree student's ability to participate in and learn from an interprofessional education exercise. If this research shows that these surveys are a valid instrument to use on diploma and Associate degree pre-major allied health stu-

dents, it could lead to their use in further research studies that could affect the curriculum of prerequisite courses. We are seeking up to 3500 participants into this study.

If you have graduated high school, are 18 years of age or older, want to enter into an allied health field, and are currently taking prerequisite courses then you qualify for this study.

This study will only take up 10-15 minutes of your time by completing a survey on inter-professional education. Participation is anonymous.

If you are interested in joining this research project or would like more information, please click on the link below.

Full Study-Online Module

You are being invited to participate in a research study through Georgia State University. The researchers of this study are seeking individuals that are high school graduates enrolled in prerequisite courses for entry into allied health programs at Gwinnett Technical College. The purpose of the study is to investigate if students taking prerequisite courses in an allied health major are ready to participate in interprofessional education. Participation in this study may not benefit you personally. Overall, we hope to gain information about diploma and Associate degree student's ability to participate in and learn from an interprofessional education exercise. If this research shows that these surveys are a valid instrument to use on diploma and Associate degree pre-major allied health students, it could lead to their use in further research studies that could affect the curriculum of pre-requisite courses. We are seeking up to 3500 participants into this study.

If you have graduated high school, are 18 years old or over, want to enter into an allied health field, and are currently taking prerequisite courses then you qualify for this study.

This study will only take up 40-55 minutes of your time by completing an online module and completing a survey on interprofessional education. This does not have to be completed in one setting, but must be completed by (date TBD). Participation is anonymous.

If you are interested in joining this research project or would like more information, please click on the link below.

Control Group Recruitment Letter

You are being invited to participate in a research study through Georgia State University. The researchers of this study are seeking individuals that are high school graduates enrolled in prerequisite courses for entry into allied health programs at Gwinnett Technical College. The purpose of the study is to investigate if students taking prerequisite courses in an allied health major are ready to participate in interprofessional education. Participation in this study may not benefit you personally. Overall, we hope to gain information about diploma and Associate degree student's ability to participate in and learn from an interprofessional education exercise. If this research shows that these surveys are a valid instrument to use on diploma and Associate degree pre-major allied health students, it could lead to their use in further research studies that could affect the curriculum of pre-requisite courses. We are seeking up to 3500 participants into this study.

If you have graduated high school, are 18 years old or over, want to enter into an allied health field, and are currently taking prerequisite courses then you qualify for this study.

This study will only take up 10-15 minutes of your time by completing a survey on interprofessional education. This does not have to be completed in one setting, but must be completed by (date TBD). Participation is anonymous.

If you are interested in joining this research project or would like more information, please click on the link below.

Gwinnett Technical College has approved this research in support of the researcher's doctoral studies. Gwinnett Tech, however, has had no involvement with the questions or administering of the questions involved in the study. Should you, as a Gwinnett Tech student, have any questions or concerns about the study, you may contact the researcher's dissertation chair (Dr. Brendan Calandra, bcalandra@gsu.edu) or the Gwinnett Tech contact (Dr. Carla Morelon, cmorelon@GwinnettTech.edu).

Appendix F

Fair Use Checklists

Fair Use Checklist

Name: Ryan Cheek Date: 04/16/2017
 Class or Project: Dissertation: Effects of IPE on Pre-Major Allied Health Students
 Course and Term: Summer 2017 & Fall 2017
 Title of Copyrighted Work: Assessing professional perceptions; design and validation of an interdisciplinary education perception scale
 Author and Publisher: Luecht, Madsen, Taugher, & Petterson, Journal of Allied Health
 Portion(s) to be used (e.g., pages, timer counts): 18 question survey, pg 183

Instructions: Where the factors favoring fair use outnumber those against it, reliance on fair use is justified. Where fewer than half the factors favor fair use, instructors should seek permission from the rights holder. Where the factors are evenly split, instructors should consider the total facts weighing in favor of fair use as opposed to the total facts weighing against fair use in deciding whether fair use is justified. Not all of the facts will be present in any given situation. Check only those facts that apply to your use. No single item or factor is determinative of fair use. Instructors should consult the Legal Affairs office at their institution or at the Office of the Board of Regents if they have questions regarding analysis of the four factors.

For more information regarding the fair use factors, please see the fair use sections of the Policy on the Use of Copyrighted Works in Education and Research for the University System of Georgia, which can be found on the web at <http://www.usg.edu/copyright/>.

Complete and retain a copy of this checklist for each "fair use" of a copyrighted work in order to establish a "reasonable and good faith" attempt at applying fair use should any dispute regarding such use arise.

Factor 1: Purpose and Character of the Use

Weighs in Favor of Fair Use

- Nonprofit Educational Institution
- Used for Purpose of Teaching (including multiple copies for classroom use) and/or Scholarship or Criticism, Comment, News Reporting, or Parody
- Used for noncommercial, nonprofit educational use
- Transformative (use changes work for new

Weighs Against Fair Use

- Commercial activity, profit from use
- For public distribution
- Used for entertainment
- Mirror image copying

utility or purpose)

Use is necessary to achieve your intended educational purpose

Use exceeds that which is necessary to achieve your intended educational purpose

Factor Weighs in Favor of Fair Use

Factor Weighs Against Fair Use

Factor 2: Nature of Copyrighted Work

Weighs in Favor of Fair Use

Weighs Against Fair Use

Published work

Unpublished work

Factual/informational and educational in nature or nonfiction work

Fiction or highly creative work (art, music, novels, films, plays, poetry)

Non-consumable work

Consumable work (workbook, test)

Factor Weighs in Favor of Fair Use

Factor Weighs Against Fair Use

Factor 3: Amount and Substantiality of Portion Used

Weighs in Favor of Fair Use

Weighs Against Fair Use

Decidedly small portion of work used (no more than 10% of work not divided into chapters or having less than 10 chapters or no more than 1 chapter of a 10 or more chapter work)

Large portion or entire work used (more than 10% of work not divided into chapters or having less than 10 chapters or more than 1 chapter of a 10 or more chapter work)

Portion used is not central or significant to entire work as a whole

Portion used is central to work or "heart of the work"

Amount taken is narrowly tailored to accomplish a demonstrated, legitimate purpose in the course curriculum and must be narrowly tailored to accomplish that purpose

Amount taken is more than necessary to accomplish a demonstrated, legitimate purpose in the course curriculum or is not narrowly tailored to accomplish a demonstrated legitimate purpose in the course curriculum

Access limited to students enrolled in course for only the term of the course

Access not limited

Factor Weighs in Favor of Fair Use

Factor Weighs Against Fair Use

Factor 4: Effect on Market for Original*Weights in Favor of Fair Use*

- Permission for digital excerpt is not readily available from publisher or Copyright Clearance Center at a reasonable price
- Decidedly small portion used
- User owns lawfully acquired or purchased copy of original work
- Use stimulates market for original work

Factor Weighs in Favor of Fair Use

Weights Against Fair Use

- Permission for digital excerpt is readily available from publisher or Copyright Clearance Center at a reasonable price
- Large portion or entire work used
- User does not own lawfully acquired or purchased copy of original work
- Use impairs the market or potential market for original work

Factor Weighs Against Fair Use

*Revised for use by the University System of Georgia, based upon the Copyright Advisory Office at Columbia University's "Fair Use Checklist",
<http://www.copyright.columbia.edu/fair-use-checklist>*

Fair Use Checklist

Name: Ryan Cheek Date: 04/16/2017

Class or Project: Dissertation: Effects of IPE on Pre-Major Allied Health Students

Course and Term: Summer 2017 & Fall 2017

Title of Copyrighted Work: The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS)

Author and Publisher: Parsell, Glennys & Bligh, John, Blackwell Science Ltd. (1999)

Portion(s) to be used (e.g., pages, timer counts): 19 question survey, pg 98

Instructions: Where the factors favoring fair use outnumber those against it, reliance on fair use is justified. Where fewer than half the factors favor fair use, instructors should seek permission from the rights holder. Where the factors are evenly split, instructors should consider the total facts weighing in favor of fair use as opposed to the total facts weighing against fair use in deciding whether fair use is justified. Not all of the facts will be present in any given situation. Check only those facts that apply to your use. No single item or factor is determinative of fair use. Instructors should consult the Legal Affairs office at their institution or at the Office of the Board of Regents if they have questions regarding analysis of the four factors.

For more information regarding the fair use factors, please see the fair use sections of the Policy on the Use of Copyrighted Works in Education and Research for the University System of Georgia, which can be found on the web at <http://www.usg.edu/copyright/>.

Complete and retain a copy of this checklist for each "fair use" of a copyrighted work in order to establish a "reasonable and good faith" attempt at applying fair use should any dispute regarding such use arise.

Factor 1: Purpose and Character of the Use

Weighs in Favor of Fair Use

- Nonprofit Educational Institution
- Used for Purpose of Teaching (including multiple copies for classroom use) and/or Scholarship or Criticism, Comment, News Reporting, or Parody
- Used for noncommercial, nonprofit educational use
- Transformative (use changes work for new

Weighs Against Fair Use

- Commercial activity, profit from use
- For public distribution
- Used for entertainment
- Mirror image copying

utility or purpose)

Use is necessary to achieve your intended educational purpose

Use exceeds that which is necessary to achieve your intended educational purpose

Factor Weighs in Favor of Fair Use

Factor Weighs Against Fair Use

Factor 2: Nature of Copyrighted Work

Weighs in Favor of Fair Use

Weighs Against Fair Use

Published work

Unpublished work

Factual/informational and educational in nature or nonfiction work

Fiction or highly creative work (art, music, novels, films, plays, poetry)

Non-consumable work

Consumable work (workbook, test)

Factor Weighs in Favor of Fair Use

Factor Weighs Against Fair Use

Factor 3: Amount and Substantiality of Portion Used

Weighs in Favor of Fair Use

Weighs Against Fair Use

Decidedly small portion of work used (no more than 10% of work not divided into chapters or having less than 10 chapters or no more than 1 chapter of a 10 or more chapter work)

Large portion or entire work used (more than 10% of work not divided into chapters or having less than 10 chapters or more than 1 chapter of a 10 or more chapter work)

Portion used is not central or significant to entire work as a whole

Portion used is central to work or "heart of the work"

Amount taken is narrowly tailored to accomplish a demonstrated, legitimate purpose in the course curriculum and must be narrowly tailored to accomplish that purpose

Amount taken is more than necessary to accomplish a demonstrated, legitimate purpose in the course curriculum or is not narrowly tailored to accomplish a demonstrated legitimate purpose in the course curriculum

Access limited to students enrolled in course for only the term of the course

Access not limited

Factor Weighs in Favor of Fair Use

Factor Weighs Against Fair Use

Factor 4: Effect on Market for Original*Weights in Favor of Fair Use*

- Permission for digital excerpt is not readily available from publisher or Copyright Clearance Center at a reasonable price
- Decidedly small portion used
- User owns lawfully acquired or purchased copy of original work
- Use stimulates market for original work
- Factor Weighs in Favor of Fair Use*

Weights Against Fair Use

- Permission for digital excerpt is readily available from publisher or Copyright Clearance Center at a reasonable price
- Large portion or entire work used
- User does not own lawfully acquired or purchased copy of original work
- Use impairs the market or potential market for original work
- Factor Weighs Against Fair Use*

Revised for use by the University System of Georgia, based upon the Copyright Advisory Office at Columbia University's "Fair Use Checklist", <http://www.copyright.columbia.edu/fair-use-checklist>