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I, Kelly R. Baird, hereby submit this original work as part of the requirements for the degree of Master of Public Health in Public Health - Leadership, Management and Policy.

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Perceptions Regarding Interdisciplinary Collaboration of Graduate Students in Health-Related Graduate Programs

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Committee chair: William Mase, Dr.P.H.
Perceptions Regarding Interdisciplinary Collaboration of Graduate Students in Health-Related Graduate Programs

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Abstract

This study assessed the perceptions of interdisciplinary team collaboration in a health care setting as reported by graduate students in health-related programs at the University of Cincinnati. Bronstein’s (2002) model of interdisciplinary collaboration guided this study, through which five domains of interdisciplinary team collaboration were explored: interdependence, newly created professional activities, flexibility, collective ownership of goals, and reflection on the process. A qualitative, exploratory design was implemented using a semi-structured interview guide to test this model. Students were recruited from four colleges including the College of Medicine, the College of Nursing, the College of Pharmacy, and the College of Allied Health Sciences. A total of seven disciplines were targeted: medicine, nursing, pharmacy, physical therapy, nutritional science, social work, and speech and communication disorders. Eight students responded to recruitment (i.e., two each from medicine, physical therapy, nutritional science, and social work), fit criteria eligibility requirements, and were interviewed. All study participants were female, with no prior experience working in their current field of study. Interviews were assessed using inductive reasoning (Thomas, 2006), and data were examined for themes first within domains, and then across domains. Six major themes emerged illustrating graduate student perceptions of interdisciplinary team collaboration in a health care setting: gaps in pre-professional education on health care teams, limited understanding of team roles, influence of personality vs. profession on teamwork, novice vs. professional work status, properties of the work environment, and patient-centered care. While findings highlight persisting gaps around interdisciplinary team collaboration, this study provides a starting point for understanding students’ educational needs to strengthen U.S. health care training programs.
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Chapter 1: Introduction

Health care is constantly evolving, and with that the collective expectation for continuous improvement. As patient care approaches change, health care professionals are asked to explore and develop creative ways to improve the health care system, often with fewer resources. One proposed and recently encouraged method to improve this system is through the use of interdisciplinary team collaboration. Today's patient conditions have shifted from acute to chronic care needs, magnifying the dependence on interdisciplinary team collaboration for proper delivery of health care services (Bronstein, 2002; Brown et al., 2011). It is now recommended that health care professionals utilize interprofessional teams and recognize that no single caregiver can support the complexity of care patients require today (Yeager, 2005).

The importance of interdisciplinary teamwork in health care is seen across multiple federal agencies. A 2001 Institute of Medicine (IOM) report, *Crossing the Quality Chasm: A New Health System for the 21st Century*, recommends “clinicians and institutions should actively collaborate and communicate to ensure an appropriate exchange of information and coordination of care” (p. 9). The newly passed Patient Protection and Affordable Care Act (PPACA) also emphasizes improving interprofessional team collaboration by offering funding opportunities to explore team-based approaches, such as patient-centered medical homes (Gardner, 2010). Furthermore, The Joint Commission (TJC) requires evidence of interdisciplinary collaboration in its hospital and primary care accreditation, recognizing the national importance of interdisciplinary team collaboration (Yeager, 2005).

Why has interdisciplinary teamwork in health systems received so much national attention? Interdisciplinary team collaboration is shown to improve the overall work environment, thus positively affecting patient care. Functioning health care teams also perform
better than organizations lacking effective teamwork (Grumbach & Bodenheimer, 2004). Proenca (2007) replicated previous research that team empowerment and a supportive work environment produce organizational commitment and job satisfaction. Additionally, good team dynamics across professions and a positive work environment produce less job turnover, resulting in fewer disruptions to patient care (Shortell et al., 1994). These empirical results on the benefits of interdisciplinary team collaboration highlight the importance of effective health care teamwork for successful patient-centered care.

While IOM and PPACA initiatives encourage collaborative work, the absence of a common language, differing philosophies, politics, and issues with scope of practice remain barriers to effective interdisciplinary health care teamwork (Greiner & Knebel, E., 2003). With today's focus on specialized treatment, it is easy for disciplines to remain in the comfortable environment of their unique culture, where language, interests, and mindset are similar (Hall & Weaver, 2001). Cooperation and coordination of care from all disciplines is needed for effective teamwork; however research shows this is not yet in existence and not enough has been done to reduce and remove these barriers (Gardner, 2010; Greiner & Knebel, 2003). Overall, health care systems and communication remain fragmented due to these differences, largely generated by the disjointed health education system currently in place.

Today's health educational settings is comprised of separate professional schools, each with different philosophies, goals, leadership, school calendars, and points of entry (Greiner & Knebel, 2003). These educational practices produce discipline-specific cultures, with a lack of appreciation and understanding of different professional roles. Students have limited exposure to collaboration strategies necessary for quality patient care prompting identity- and value-based disputes once placed in the professional workplace (Gardner, 2010; Greiner & Knebel, 2003).
Hall and Weaver (2001) attribute this concern to anxiety, stating “poor understanding of the other person’s role…caus[es] anxiety, conflict and ineffectiveness as a team (p. 871). Psychological research confirms this outcome suggesting members of separate cultures interpret, thus respond to situations differently (Gibson & McDaniel, 2010).

Hall and Weaver (2001) studied interdisciplinary health education and found "two categories of issues emerge from the literature: one pertaining to the system of education and training of health care professionals, and the other to the content of interdisciplinary education" (p. 868). Their research suggests a general need for interdisciplinary education of health care professionals; however there are still many unanswered questions about when, what and how to educate these professionals (Hall & Weaver, 2001). Until these educational differences are resolved, the field should not expect conflict-free interdisciplinary collaboration to transpire.

The need for greater pre-professional training and exposure to interdisciplinary team collaboration is evident, and should be addressed before health care professionals enter the workforce with established (often conflicting) philosophies and values. While research attention is focused on interdisciplinary collaboration in health care environments, little is known concerning how pre-professional students (i.e., the future health care workforce) will respond to the interdisciplinary team environment. This presents an opportunity for further research exploration.

The purpose of this research study is to explore the perceptions of pre-professional, graduate students in health-related programs regarding their knowledge and beliefs on the anticipated benefits and challenges of working within an interdisciplinary health care team. The primary research aim is to identify and recommend prospective areas of improvement in educational efforts to prepare graduate students to work effectively in an inter-professional,
collaborative environment. The secondary aim of this study is to extend current research pertaining to effective interdisciplinary practices in health care as presented by Bronstein's (2002) model on interdisciplinary collaboration, and to determine if this model also relates to graduate student awareness and behaviors. Knowledge gained from this qualitative, exploratory study is expected to inform future research on interdisciplinary team collaboration to better prepare graduate health care students to be effective team members. Findings from this study may further identify and address proper formatting and structure of graduate curriculum on interdisciplinary team collaboration. This in turn may improve patient and consumer health care outcomes by strengthening the teamwork skills essential to today's health care delivery system.
Chapter 2: Literature Review

Interdisciplinary collaboration is defined as a partnership between two or more health care disciplines that facilitates the achievement of goals optimizing knowledge, skills and perspectives of each team member (Bronstein, 2002; Jansen, 2007). As expressed by the Institute of Medicine (IOM), the purpose of an interdisciplinary team is to combine practitioners’ “bodies of expertise, and spheres of decision making to coordinate, collaborate, and communicate with one another in order to optimize care for a patient or group of patients” (Greiner & Knebel, 2003, pg. 54). The importance of interdisciplinary team collaboration is widely recognized, and becoming a focus for quality improvement in health care practice.

While the importance of cross-disciplinary teamwork in a health care setting is documented, “cooperation and coordination across all the professions is not yet a reality” (Greiner & Knebel, 2003, p. 79). This lack of team cooperation is attributed to improper or underutilized training of health care professionals on how to work effectively within a diverse health care team. Hall and Weaver (2001) suggest the scarcity of research, literature, and evidence addressing the ability of practicing health care professionals to acquire the collaborative skills may lead to this disconnect. The question remains whether practicing health care professionals have the ability to adopt collaborative skills after mastering the discipline-specific skills, culture and philosophies.

The IOM released a 2001 report, Crossing the Quality Chasm: A New Health System for the 21st Century detailing a need for quality improvement of the United States health care system. This IOM report offers evidence that the U.S. health care system does not provide dependable, high quality medical care, and suggests “between the health care that we now have and the health care that we could have lies not just a gap, but a chasm” (IOM, 2001, p. 1). This
report describes the current health care delivery system as “poorly organized,” “overly complex” and “uncoordinated” resulting in a disjoined health care delivery system allowing for missed information and injury (IOM, 2001, p. 1). In response to this finding, six objectives are recommended for improved care: safe care, effective care, patient-centered care, timely care, efficient care, and equitable care (IOM, 2001). As presented by the IOM, an improved U.S. health care system not only depends on urgent changes to current practices, but also to the education system in which future health care clinicians are trained. One strategy for improvement to this system is through pre-professional, interdisciplinary health education.

**Motivation to Change**

Multiple federal agencies advocate the use of interdisciplinary teams in health care through means of funding, policy and promotion. Collectively these institutions, including the Institute of Medicine (IOM), The Joint Commission (TJC), the Department of Health and Human Services (DHHS), and the legislative branch displayed through the Patient Protection and Affordable Care Act (PPACA), strongly encourage the use of cross-disciplinary teamwork for effective patient care. In this section, the specific influence on interdisciplinary team collaboration pertaining to the aforementioned federal agencies will be discussed.

The 2001 IOM report highlights the critical need for quality improvement in order to provide exceptional patient care in the current health care system. Four key strategies for changing today's health care environment are identified by the IOM: applying evidence to health care delivery, using information technology, aligning payment policies with quality improvement and preparing the workforce (IOM, 2001). The focus on interdisciplinary collaboration lies within the strategy of preparing the workforce. The IOM suggests an effective health care
workforce will be produced through greater emphasis on evidence-based practice, and more opportunities to train collaboratively (IOM, 2001).

In response to the 2001 IOM report, 150 interdisciplinary health care professionals assembled to further discuss health care improvement strategies. This summit produced the 2003 IOM report: *Health Professions Education: A Bridge to Quality*, which identified five core educational competencies and ten major recommendations for health education reform to improve U.S. health care services. The five core competencies include providing patient-centered care, working in interdisciplinary teams, employing evidence-based practice, applying quality improvement, and utilizing informatics (Greiner & Knebel, 2003). Overall, the IOM is focused on implementing and utilizing interdisciplinary team collaboration to improve patient care in the twenty-first century.

Next, TJC identifies effective interdisciplinary team collaboration as a key element of health care accreditation standards. The theme of collaboration is threaded throughout TJC standards with a focus on practitioner team collaboration and cooperation between medical staff and the governing bodies of medical centers (The Joint Commission, 2010b). TJC seeks to “encourage leaders to participate in interdisciplinary patient rounds” placing an emphasis on the need for team collaboration for effective care (The Joint Commission, 2010a, pp. 34). Overall, TJC’s recognition and advocacy of teamwork as a health care standard is a persuading force to implement these practices.

The DHHS is also involved in current efforts to encourage the use of cross-professional teams in a health care setting. As part of its 2010-2015 strategic plan, the DHHS addresses the need to expand opportunities for interprofessional training in the workforce and infrastructure in order to meet the current demands of patient care (U.S. Department of Health and Human
Services, 2011). Finally, the most recent push for interdisciplinary collaboration comes from the PPACA signed into law on March 23, 2010 by President Barak Obama. The PPACA seeks to unify patient care by establishing patient-centered medical homes (PCMH), which aims to centralize and coordinate patient care through an interdisciplinary team approach. The American Academy of Family Physicians defines PCMHs as “ongoing, active partnership with a personal primary care physician who leads a team of professionals dedicated to provide proactive, preventive and chronic care management through all stages of life” (American Academy of Family Physicians, 2012). This team could consist of, but is not limited to, physicians, nurses, nurse practitioners, physician assistants, dentists, psychologist, optometrists, pharmacists, dietitians, physical therapists, social workers or other allied health professionals. The PPACA also encourages the education of interdisciplinary practices in graduate programs for students and faculty in public health and other health professions in effort to facilitate the future implementation of PCMHs (Patient Protection and Affordable Care Act of 2010).

Across these agencies, the federal level push for interdisciplinary collaboration makes a compelling argument for action, and it is not surprising health care organizations are making a significant effort to promote and produce effective teams to improve patient care. This momentum for interdisciplinary team collaboration stems from the current, promising research on this topic.

**Benefits of Interdisciplinary Team Collaboration**

The recent effort to improve the health care system is focused on increasing the use of interdisciplinary teams. Effective interdisciplinary coordination produces fewer and shorter delays, improved morale, greater job satisfaction, increased organizational commitment, increased efficiency, lower staff stress, improved patient satisfaction, enhanced clinical
effectiveness, fewer medical errors, decreased hospital length of stay, and increased creativity of care (Greiner & Knebel, 2003; Proenca, 2007; Yaeger, 2005). While numerous positive outcomes are described in the literature, overall trends indicate the benefits of effective teamwork fundamentally rest in increased cost savings, improved patient care, and increased job satisfaction. These promising findings parallel those of federal agencies in advocating for interdisciplinary team collaboration.

Effectively communicated and coordinated patient care can produce significant cost savings, especially in high-cost patient populations. Horbar et al. (2001) examined quality of care and cost savings associated with collaborative quality improvement for a neonatal intensive care unit and found cross-disciplinary collaboration for treatment resulted in fewer infections and improved outcomes producing cost-savings. Additionally, Hall and Weaver (2001) found "the complexity of patient care has contributed to the increasing awareness that effective interdisciplinary teams may help reduce costs by reducing service duplication and minimizing unnecessary interventions" (p. 872). Other high-cost health care settings that may financially benefit from interdisciplinary collaboration include intensive care units, trauma units, and emergency rooms.

Effective interdisciplinary teamwork is also found to promote patient safety and improve patient care. The Institute of Medicine (IOM) reports "teams tend to reduce the utilization of redundant or duplicate services, and they also tend to develop more creative solutions to complex problems because of their members' diverse academic background and expertise" (Greiner & Knebel, 2003, p. 54). Creativity found through diverse backgrounds can benefit patient care by producing innovative solutions to complex problems presented in today's health care system.
Moreover, patient safety is directly related to the level of communication between health care professionals. Patient care is often in the hands of multiple health care professionals and dependent upon effective interactions between practitioners. Errors in a health care setting are often the result of system failures (e.g., miscommunication) rather than the skill of an individual health practitioner (Smith & Cole, 2009). Manser (2009) found a significant relationship between teamwork and patient safety discovering effective communication to result in fewer adverse events. With the aforementioned research, there is a major push to strengthen the relationships between, and understanding of other disciplines in order to improve communication and optimize patient safety.

Interdisciplinary teamwork through means of work atmosphere also impact job satisfaction and employee morale. Proenca (2007) found the better the team-based atmosphere, the higher the job satisfaction and organizational commitment. Shortell et al. (1994) furthers this notion by connecting positive team atmosphere and function to nurse retention. Additionally, Manser (2009) found staff member perceptions of being valued as part of an effective team also related to employee retention. The above-mentioned benefits demonstrate the appeal of an effective collaborative approach among different health care disciplines. Improvements in patient safety and care, increased cost-savings, and higher employee commitment help to facilitate the need for discovering and implementing factors that will positively influence the collaborative approach.

**Factors that Influence Collaboration**

In order to produce effective interdisciplinary team collaboration, it is important to recognize the factors that influence this outcome. Teamwork is a complex, dynamic process that involves a wide array of skills for success. Bronstein (2003) provides a framework for
examining the factors that influence collaboration through her two-part model of interdisciplinary collaboration. Five components comprise part one of this model, including interdependence, newly created professional roles, flexibility, collective ownership of goals and reflection on the process. In part two of this model, Bronstein proposes four factors that either facilitate or hinder health care teams from functioning at their full potential: professional roles (e.g., understanding of each disciplines professional role), structural characteristics (e.g., professional autonomy, time, and space for collaboration to occur), personal characteristics (e.g., respect and trust), and history of interdisciplinary collaboration.

First, **interdependence** requires a clear understanding of one's own role as well as the roles of other team members (Bronstein, 2002; Harris, 2006; Schofield, 2005). Yeager (2005) furthers this notion describing "a mutual respect for each profession's contribution toward patient care is necessary" to accomplish goals (p. 147). Successful collaboration occurs when every team member is actively involved in decision-making and depends on the team members to accomplish set goals (Yeager, 2005). In order for teams to function at optimal levels, members must rely on each other and be codependent rather than independent.

Another important factor influencing collaboration is utilization of each team member's expertise to the greatest extent possible. Bronstein (2002) describes this as **newly created professional activities** and defines this factor as "collaborative acts, programs, and structures that amount to more than what is created when the same professionals act independently" (p. 114). Application of each team member's unique skill set can result in new ideas, allowing for every team member to make a distinctive contribution (Schofield, 2005).

**Flexibility** is also a necessary factor for teams to function at optimal levels. Flexibility is observed through loss of autonomy, often resulting in role blurring. Hall and Weaver (2001)
find "role blurring [to be] necessary for function as an interdisciplinary team" and places an emphasis on the adoption of this concept by health care professionals (p. 873). Overlap in health care team member roles is bound to occur, and it is through flexibility in which team members find productive compromises positively impacting collaboration (Bronstein, 2002; Schofield, 2005). Moreover, flexibility plays a key role in conflict resolution. The ability of an interdisciplinary team to implement conflict resolution and healthy communication depends on the degree of flexibility shown (Yeager, 2005). Hall and Weaver (2001) further the importance of flexibility by suggesting "conflict resolution is an essential skill for all team members to master at an early stage" (p. 872). Flexibility shapes team dynamics by either fostering or hindering compromise and conflict resolution.

Additionally, the level of collectively accepting and developing goals impacts interdisciplinary teamwork (*collective ownership of goals*). Xyrichis and Ream (2008) describe the development of shared team goals as a necessary consideration to take when developing a collaborative group in order for teams to be effective and operate in a smooth fashion. Team success depends on the "extent to which all team members recognize this shared commitment" and collectively decide on responsibilities and aims (Schofield, 2005, p. 4). Furthermore, goals in a health care setting are more likely to be accepted if team members collectively develop these objectives (Proença, 2007). The cooperative establishment of goals has the ability to act as a unifying force to achieving interdisciplinary team success.

Finally, Bronstein (2002) emphasizes the necessity of feedback (*reflection on the process*) when working across disciplines. Schofield (2005) believes an "effective team encourages its members to give feedback to each other" and that feedback should always be twofold: identification of strengths and areas for improvement (p. 5). Feedback is necessary for
quality improvement of team communication and team function. By providing constructive feedback, team members can learn to utilize their strengths and work toward improving their weaknesses, and in turn improve the overall interdisciplinary team effectiveness.

Knowledge of the aforementioned factors to collaboration impacts effective interdisciplinary team strategies. Pre-professional education of future health care practitioners that incorporate these factors may help improve interdisciplinary team collaboration in the professional setting. Using the education system as a front-end, preventative method could be the catalyst in changing the culture of today’s health care teams.

**Current Health Education Practices**

Hall and Weaver (2001) suggest universities are accountable for educating graduate students on interdisciplinary team collaboration. Graduate students must be better prepared to handle a team environment; however very few programs offer comprehensive interdisciplinary courses (Hall & Weaver, 2001). With new emphasis from federal agencies to improve operations, health education centers are attempting to evolve based on the Institute of Medicine's (IOM) recommendations.

While the change toward collaborative curriculum is slowly occurring, interprofessional education has not yet become the centralized norm for medical schools (Blue, Zoller, Stratton, Elam, & Gilbert, 2010). Rafter et al. (2006) support this sentiment by finding seventy-one percent of surveyed academic health centers to have very little or no formal interprofessional coursework as part of the pre-doctoral curriculum. Additionally, Larson (2012) found only fourteen percent of contacted multi-disciplinary academic health centers had even one interdisciplinary course available to socialize and prepare students for interdisciplinary collaboration. Finally, a study of forty-eight medical schools found only sixty-six percent of
schools offered formal or informal interprofessional experiences (Blue et al., 2010). In summary, "some training for team practice occurs, but that training is typically fragmented and isolated by health discipline" (IOM, 2001, p. 113). These findings emphasize the disparity between IOM goals and health education centers regarding interdisciplinary collaboration.

In addition to opportunity, there is a paucity of evidence-based methods supporting the improvement of interdisciplinary team skills. Although there is a growing body of literature and research on collaboration in health care, there "are no well-defined models for training students during their didactic years to become effective members of an interdisciplinary team" (Gardner, Chamberlin, Heestand & Stowe, 2002, p. 180). With this lack of direction or standardization, it is unlikely pre-professional students will be prepared to become effective team members in the professional health care setting. The clear disconnect between preparation and application displays a need for additional research on this topic.

**Challenges and Barriers to Change**

The current health care and health education system is one of fragmented parts. As expressed in the 2003 Institute of Medicine (IOM) report, "the health care system can hardly be called a system, [but] rather it is a dizzying array of highly decentralized sections" (p. 30). Interdisciplinary collaboration has received significant attention; however there are substantial barriers and challenges in place preventing an easy adoption of these practices. Barriers and challenges can be broken down into three categories: institutional barriers, cultural barriers, and research related barriers.

Institutional barriers present challenges from a policy, structural, and financial standpoint. In general, an unprepared and apathetic faculty, structural and environmental barriers, laws, policies, payment reimbursement policies and professional regulatory boards all
present unique challenges in evolving health education toward an interdisciplinary approach (Greiner & Knebel, 2003). These challenges prove to be deep-rooted posing an obstacle to the implementation of interdisciplinary collaborative methods. Many academic health centers face a great challenge in allocating funding to support interprofessional education (Rafter et al., 2006). Gardner et al. (2002) surveyed academic health centers and found "the majority of respondents from all disciplines agreed that a lack of financial resources [and] a lack of administrative support" were major barriers preventing interdisciplinary didactic education (p.183). Blue et al. (2010) furthered this notion by surveying administrators and finding their second greatest concern in implementing interdisciplinary courses was limitations in funding. Overall, there is "a lack of funding to review curriculum and teaching methods...required to make needed changes" in the U.S. health education system for an interdisciplinary approach (Greiner & Knebel, 2003, p. 37). Simply stated, if money is not available to develop and implement course content, it is very unlikely institutions will be able to move forward with interdisciplinary education.

Physical distance, calendar year differences, and time constraints are other institutional concerns when attempting to implement interdisciplinary health education. Today, health academic institutions are physically separated creating different "silos" acting as a barrier to social and professional interaction (Gardner, 2010; Greiner & Knebel, 2003; Rafter et al., 2006). This physical separation also presents a challenge for effective communication, which can lead to further disconnect (Hall & Weaver, 2001). Moreover, calendar years (e.g., semester system vs. block system) and points of entry differ between schools causing scheduling conflicts (Blue et al., 2010; Gardner et al., 2002; Rafter et al., 2006). Likewise, if faculty members are uncomfortable with concepts of interdisciplinary collaboration, it is unlikely they can educate
students on management and social skills needed for successful team collaboration (Hall & Weaver, 2001). Without uniform schedules and acceptance from faculty, coordination becomes difficult.

Time also presents a challenge to implementation of collaborative health education. Discipline-specific course load is demanding with little room or time for additional courses (Gardner et al., 2002; Greiner & Knebel, 2003; Rafter et al., 2006). Many institutions would have to replace established curriculum in order to allow interdisciplinary education, something a majority of institutions feel will compromise discipline-specific preparation vital to professional success (Rafter et al., 2006). As noted, institutional barriers pose a challenge to implementing interdisciplinary health education.

Established cultures also present a unique challenge in people's beliefs, values and philosophies. Often times, individuals desired to learn and interact within the comfort of their discipline where language and philosophies align (Hall & Weaver, 2001). Many health professions use different language, abbreviations and terms in practice, which may lead to confusion and difficulty solving problems when working in interdisciplinary teams (Gardner et al., 2002; Weaver, 2008; Yeager, 2005). A "lack of consensus across the professions around language and terms related to the core competencies" hinders the development of interdisciplinary team skills making collaboration difficult (Greiner & Knebel, 2003, p. 6).

When team members are trained in different arenas with different languages, stereotypes (often negative) can develop causing confusion and conflict without the understanding of professional roles (Hall & Weaver, 2001; Schofield, 2005). This misunderstanding can often lead to "turf battles" when scope of practice or financial gains are threatened (Brown et al., 2011; Gardner, 2010). If students are not informed about other disciplines’ roles and are unable to communicate
with other disciplines it is likely confusion and conflicts will emerge in practice. In order to overcome this obstacle, professionals from all disciplines must learn to communicate and establish a shared language in order to produce an effective team unit (Newhouse & Spring, 2010).

In addition to language, philosophies differ greatly among professions. Disciplines are taught to think in different ways, and are educated in "schools [that] have philosophical and cognitive style differences" resulting in opposing theories of logic leading to team conflict (Greiner & Knebel, 2003, p. 7). Finally, health care disciplines have different social structures. These social structures are established and defined by traditional philosophies, laws and professional regulatory boards prompting differences in thought process. Students learn discipline-specific ways to interpret and address issues, which may differ from other disciplines and lead to conflict (Hall & Weaver, 2001). While health care students and professionals desire effective patient care, each "discipline [is] rooted in different professional training backgrounds and hold distinct professional perspectives (Newhouse & Spring, 2010, p. 316). Medical students are often taught be the leaders of a team and place their professional identify on this responsibility; however if compromised physicians may feel threatened because part of their professional identity is being challenged (Gardner, 2010). Furthermore, some professions emphasize a hierarchical system in which senior member's ideas are authority, and some team members may be unwilling to challenge those practices (Schofield, 2005). These professions often place senior members in leadership roles regardless of their leadership skills or ability to do so.

A paucity of evidence-based methods on how, when, and what to educate students on interdisciplinary collaboration also presents a challenge to established effective health education.
Gardner et al. (2002) examined feedback from academic health center administrators regarding interdisciplinary education, and a major concern expressed was a lack of successful models with proven outcomes causing little desire to implement interdisciplinary courses. Furthermore, recommended educational methods are not consistent in the literature, which also causes confusion (Hall & Weaver, 2001). This lack of evidence-based educational practices presents a challenge when designing and recommending interprofessional curriculum.

**Opportunities for Improvement**

While substantial research exists examining the need for interdisciplinary education, little is known on best practices for educating health care students about effective teamwork. Furthermore, information is scarce on the attitudes of students toward interdisciplinary health education and how best to approach the topic in undergraduate and graduate level courses. Overall, there is limited research on the impact of pre-professional interdisciplinary education, presenting an excellent opportunity for future research. Although best practices are lacking, some research has addressed the promising impact education can have on the attitudes of students toward the idea of working in a team setting.

A study by Furze, Lohman and Mu (2008) found that using inter-professional, community-based education positively changed the attitudes of students in allied health programs in understanding and respecting other health professionals. Other research on graduate students in health-related programs found overall attitudes about health care teams and health care team efficiency to be positively affected following an informative, five-hour symposium on the use of an interdisciplinary team approach in treating older adults (Zucchero, Hooker, & Larkin, 2010). Additionally, studies have shown that education and application of interdisciplinary collaboration helped to inform students on the roles of other disciplines and in
turn increase their perceived respect toward other professions allowing for students to work better in teams (Taylor, Cook, Cunningham, King, & Pimlott, 2004). This research along with federal and organizational commitment to increasing interdisciplinary collaboration displays a window of opportunity to improve the health education system.

The aforementioned studies provide preliminary evidence that education on the topic of professional roles and collaboration show promise in improving team attitudes and team function. By examining the current attitudes of students in health-related programs, major concerns can be identified, thus incorporated into course content and method of education on this topic. Through research, evidence-based best practices can be identified and established in efforts to address the institutional and cultural barriers currently preventing successful interdisciplinary education. In doing so, an improved spirit of collaboration within our health care system is possible.
Chapter 3: Research Methods

Study Overview and Research Design

This study's purpose was to assess the perceived concerns regarding interdisciplinary team collaboration as reported by graduate students in health-related programs at the University of Cincinnati. The methodical strategy utilized inductive reasoning as guided by Thomas (2006). Inductive analysis is a method “commonly used in health and social science research and evaluation” (Thomas, 2006, p. 237). The model of interdisciplinary collaboration developed by Bronstein (2002) guided this study and provides the frame of analysis for inductively assessing the raw data. In order to test this model, a qualitative, exploratory design was implemented using a semi-structured interview guide. This study received Institutional Review Board (IRB) approval (Appendix B).

Population and Sample

The population of interest was graduate students training to become future physicians, nurses, social workers, dietitians, physical therapists, speech language pathologists, pharmacists, or other allied health professions. The study sample was derived from graduate students enrolled at the University of Cincinnati studying in the field of medicine, nursing, physical therapy, communication sciences and disorders, nutritional science, social work, or pharmacy. These areas of study were chosen based on the availability of graduate programs offered at the University of Cincinnati, and in alignment with the literature as fields comprising typical clinical interdisciplinary health care teams. Criteria for eligibility included: age eighteen years old or older, currently enrolled part-time or full-time in a health-related graduate program on-site at the University of Cincinnati for the academic year of 2012-2013, fluent in the English language, and
no prior experience working as a professional in the current field of study. This study was open to all genders, races, ethnicities and backgrounds.

Study recruitment occurred on campus at the University of Cincinnati with sample selection occurring across four academic colleges: College of Medicine, College of Nursing, College of Pharmacy, and College of Allied Health Sciences. Within these four colleges, seven disciplines met sample needs (i.e., nursing, pharmacy, physical therapy, communication sciences and disorders, nutritional science, social work and medicine). Up to two students from each discipline were eligible for recruitment allowing for a maximum of fourteen total study participants.

Study recruitment involved a two-part process. First, college program directors or program coordinators were contacted for each discipline’s respective school (Appendix C). This individual was then asked to provide the best form of communication to reach students in their program regarding the research study (e.g., e-mail, phone, student groups). In order to protect participant confidentiality, directors and coordinators were instructed not to recommend or target specific students. All program coordinators recommended e-mail as the best form of communication, and two methods of e-mail correspondence occurred: an e-mail listserv was provided to the study investigator who then e-mailed the students, or program coordinators forwarded the recruitment document via e-mail to students in their respective program (Appendix D).

Interested students who responded to recruitment messages and who met study eligibility criteria were accepted on a first-come, first-serve basis until the maximum two students were recruited from each discipline. If additional students responded to recruitment after the maximum students were enrolled from each discipline, they were thanked for their interest and
informed the study had met its participant capacity for their specific discipline. For those participating in the study, a time, date, and location were selected by the interviewee to meet with the researcher in order to complete the informed consenting process and the in-person interview.

A total of eight graduate students responded to study recruitment, met study criteria, and were interviewed (see Table 1). Of the recruited students, one participant was enrolled part-time and seven were enrolled full-time, with all study participants being female. Two students from each of the following programs represented the study sample: medicine, physical therapy, nutritional science, and social work. All research study participants stated to have no prior experience outside of their respective graduate programs in the area in which they were studying.

<table>
<thead>
<tr>
<th>Student</th>
<th>Discipline</th>
<th>Year of Study</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medicine</td>
<td>Third</td>
<td>Female</td>
</tr>
<tr>
<td>2</td>
<td>Medicine</td>
<td>First</td>
<td>Female</td>
</tr>
<tr>
<td>3</td>
<td>Nutritional Science</td>
<td>First</td>
<td>Female</td>
</tr>
<tr>
<td>4</td>
<td>Nutritional Science</td>
<td>Fourth</td>
<td>Female</td>
</tr>
<tr>
<td>5</td>
<td>Physical Therapy</td>
<td>Third</td>
<td>Female</td>
</tr>
<tr>
<td>6</td>
<td>Physical Therapy</td>
<td>Second</td>
<td>Female</td>
</tr>
<tr>
<td>7</td>
<td>Social Work</td>
<td>Second</td>
<td>Female</td>
</tr>
<tr>
<td>8</td>
<td>Social Work</td>
<td>First</td>
<td>Female</td>
</tr>
</tbody>
</table>

Instrument and Metrics

The key concept assessed in this study was perceived value of interdisciplinary team collaboration, specifically assessing graduate students’ comfort with interprofessional interaction and their level of exposure to interdisciplinary team collaboration in their respective program. This study’s researcher reviewed the literature for a valid and reliable qualitative instrument that best fit the aims of the study, and upon finding none adapted a valid, reliable quantitative instrument (i.e., *Index of Interdisciplinary Collaboration*) developed by Bronstein (2002)
(Appendix G), into a semi-structured interview guide (Appendix F). The adapted interview instrument used in this study has yet to be tested for validity or reliability.

The researcher also extended the modified Bronstein instrument in order to capture general perceptions and current practices within each discipline's graduate program. Approval to use and adapt Bronstein’s instrument was given by Dr. Bronstein (Appendix A). In order to assess the study's key concepts, the focus of the developed qualitative instrument centers around part one of Bronstein's model of interdisciplinary collaboration, and includes her five established components (domains): interdependence, newly created professional activities, flexibility, collective ownership of goals, and reflection on process (see Table 2).

Table 2

*Five Domains of Bronstein's Model of Interdisciplinary Collaboration (Bronstein, 2003)*

<table>
<thead>
<tr>
<th>Domain</th>
<th>Description</th>
</tr>
</thead>
</table>
| Interdependence               | • The occurrence and reliance on interactions among professionals, with each dependent on the other for accomplishing established goals  
                                 | • Clear understanding of the distinction between their role and other professionals' roles                                             |
| Newly Created Professional Activities | • Collaborative acts, programs, and structures can achieve more than what could be achieved by the same professional acting independently  
                                         | • Maximizing the expertise of each team member                                                                                  |
| Flexibility                   | • Deliberate 'role blurring' allowing for productive compromises                                                                               |
| Collective Ownership of Goals | • Shared responsibility in the process of developing and achieving goals  
                                       | • Each professional takes responsibility for his/her part in the successes and failures of the team                             |
| Reflection on the Process     | • Collaborators' thinking and talking about working relationships and the process of feedback to strengthen collaborative relationships and effectiveness |

Data Collection

Data were collected through face-to-face interviews held on campus at the University of Cincinnati between the researcher and the study participant at a time and location chosen by the study participants. Interviews occurred during the first semester of academic year 2012-2013, during the third week of October 2012. Each interview was conducted separately to ensure
confidentially and to provide a comfortable environment in which to share personal perceptions on the research topic. The researcher obtained written consent at each meeting prior to the interview, and any questions the participants had concerning the study were answered at this time (Appendix E). All interviews were audiotaped (with consent) and the researcher took field notes to capture sentiments and context to responses.

Interviews were allotted a one-hour time frame, which required narrowing of the instrument to selected questions within each assessment domain (see Appendix H, Table H1). The selected questions from each domain were consistent across all interviews and participants were asked to respond with open answers reflecting their personal opinions about interdisciplinary team collaboration as a future health care practitioner. Upon completion, the study's researcher transcribed the audiotaped interviews into word-processing software, and study participants were assigned study identification numbers to ensure confidentiality.

**Data Analysis**

Interview transcripts were reviewed individually and then collectively to identify general themes that occurred within each domain and across domains. A general inductive approach (Thomas, 2006) was used to analyze the data and included the following course of analysis: preparation of audio recordings to raw text data files, close reading of the text multiple times, creation of general level categories, creation of major themes as developed from overlap of the general level categories, and discovery of contradictory points of view and new insight. Examples of text were then utilized to illustrate the points made and support the researcher’s key findings (Thomas, 2006). The purpose of using an inductive approach was to identify commonly reported patterns in the data and "establish clear links between the research objectives
and the summary findings from the raw data, and to develop a model or theory about the underlying experiences or processes which are evident in the raw data" (Thomas, 2006, p. 238).

For the purpose of this study, the frame of analysis was pre-established by the Bronstein model domains structured in the interview instrument (i.e., interdependence, newly created professional activities, flexibility, collective ownership of goals, and reflection on process). These frames helped identify themes within each domain (see Figure 1). The data were examined from an educational viewpoint and a professional application viewpoint within each domain to identify general themes (phenomenological findings). General themes within each domain were then analyzed across domains to determine major themes (thematic findings) related to interdisciplinary team collaboration. Contradictory points were then identified to allow for new insight as recommended by Thomas (2006).

Finally, trustworthiness was considered during the data collection process by verifying field note summaries with study participants to ensure accurate capture of their reflections and observations. This process of stakeholder or member checking complies with methods outlined by Thomas (2006).

**Figure 1**

*Bronstein Model Frame of Analysis*
Chapter 4: Findings

Findings are presented in the order in which questions were asked beginning with reflections on interdisciplinary team collaboration. Next, questions reflecting the five domains of Bronstein's model of interdisciplinary collaboration are offered followed by perceptions of current graduate school education regarding preparation for interdisciplinary team collaboration. This section then concludes with a summary of the salient themes across the general domains.

Phenomenological Findings of Independent Questions and Bronstein Model Domains

Interdisciplinary team collaboration. During the interview, study participants were asked to describe their overall perceptions of interdisciplinary collaboration and their willingness to participate as part of an interdisciplinary team in the future. Each expressed positive opinions on interdisciplinary team collaboration and a desire to work in a team environment as a future practitioner. Of these reflections, three primary benefits emerged: enhanced patient care, development of innovative solutions, and expansion of one's own professional knowledge (see Table 3).

Table 3

Student Perceptions on the Benefits of Interdisciplinary Collaboration

<table>
<thead>
<tr>
<th>Category</th>
<th>Primary Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits of Interdisciplinary Collaboration</td>
<td>Expert in every area, so much information, answers more quickly, different ideas, additional resources, multiple perspectives, more ideas to the table, better answers, play off others' strengths, different viewpoints, outside the box thinking</td>
</tr>
<tr>
<td></td>
<td>Benefit to the patient, enhancement of the patient experience, enhanced delivery of patient care, best experience for the patient, patient has the best care, best of the patient, provide better care, better connection for the patient, patient-centered</td>
</tr>
<tr>
<td></td>
<td>Broaden my own expertise, broad picture provided, make me better, help me to think of things differently, enhance other's knowledge, supplement discipline specific knowledge, save personal time, see through different eyes</td>
</tr>
</tbody>
</table>
It was often expressed that a major benefit of interdisciplinary collaboration was the development of innovative solutions to patient care. For example, participants noted that patient care is more creative due to having an expert in every area of need producing diverse viewpoints. By having multiple perspectives, different ideas can emerge allowing for members to play off each other's strengths and outside the box thinking. A physical therapy student expressed these benefits of collaboration by stating:

"...I think that people have their own area of expertise and so what I’m lacking in other people are better....Kind of, helping each other learn about the patient...and making sure that we’re giving the best care...."

While a social work student noted:

"The process of teamwork, I think it brings answers more quickly. I think it allows for outside the box thinking where answers can be discovered that might not be discovered before."

The second major benefit expressed by study participants was enhanced patient care. Participants described these as: benefits to the patient, enhancement of the patient experience, enhanced delivery of patient care, best experience for the patient, and the ability to provide better care to the patient by working in a team setting. A social work student stated:

"I also think it serves the patient better, if different ideas can be brought, it communicates to the patient that you’re doing everything you can do."

Finally, the third major benefit expressed by study participants was expansion of professional knowledge. Study participants expressed that interdisciplinary team collaboration broadens their own experience and the picture of the patient provided. They also stated it allows
for seeing things outside one’s discipline, thus overall expanding their knowledge about patient care. A physical therapy student expressed this benefits as:

"...I think it’s good for our professional development because we pick up tips and tricks... that we don’t get in school... it just makes us look at the patient as a whole."

When asked about the risks of interdisciplinary collaboration, there was general agreement that risks exist and are most often associated with miscommunication and role boundary issues. A nutritional science student summarizes it this way:

"...I can see how it can be, threatening to somebody who maybe has that kind of personality or I can also see how it can make it confusing for like the patient...if the health care team isn’t communicating well...they might be stepping on each other’s toes."

The next set of findings is directly linked to the five Bronstein model domains provided through the semi-structured interview. Upon examination of each, separate domain, multiple dominant themes emerged as key findings (Appendix H, Table H3).

**Interdependence.** The domain of interdependence explored professionals' abilities to rely and depend on other professionals to contribute to patient care. This stems from having a clear understanding of the distinction between professionals' roles, and having a dependence on others to reach cooperatively established goals (Bronstein, 2002). For this domain, participants were first asked to reflect on their feelings about giving feedback on patient care to professionals outside their field. Participants were then asked about their own future role as an interdisciplinary team member, and what they perceived other professionals would know about their (i.e., respondent’s) team role.
This domain was first examined from a professional application viewpoint. The majority of participants replied they would not feel comfortable giving feedback to other professionals outside of their field, and they believed positive feedback was appropriate in an interdisciplinary setting although negative feedback was unnecessary. Participants also expressed concerns largely around role uncertainty and the teamwork environment. For example, common concerns included clearly defining one’s scope of practice and understanding of role boundaries, as well as leadership acceptance of each role on the interdisciplinary team. A medical student summarized the concerns of interdisciplinary feedback as:

"I think that’s a tough one, if... it's something like... an extreme mistake where they need feedback or if they’re causing harm to the patient then I feel like it would be important, but at the same time... I didn’t go to nursing school, I didn’t go to PT school, I don’t know... all the things that they know."

Each question was then examined for education specific concerns. Participants responded overall that they perceived existing gaps in their education stemming from a lack of interdisciplinary team collaboration projects in graduate school. This lack of exposure led to discomfort with feedback due to minimal knowledge about the educational components of other disciplines, and the limited time in their graduate work to initiate collaboration with other disciplines due to heavy discipline-specific course content. This idea is summarized by a nutritional science student:

"...instead of you get taught everything that you’re supposed to do, and you go in, and you get a tunnel vision of like this is how I take care of the patient and you don’t get an idea of how other people can help you take care of the patient."

29
**Newly created professional activities.** The domain of *newly created professional activities* encompassed the notion that more can be accomplished together than independently, thus allowing for services to be provided in ways that could not be established without collaboration (Bronstein, 2002). For this domain, participants were asked about their perceptions on the production of innovative and creative outcomes through collaboration with other disciplines, as well as their reflection on producing better outcomes collectively rather than alone.

This domain was first examined from a professional application viewpoint. Across participant interviews, it was collectively agreed that interdisciplinary collaboration led to more creative and innovative solutions than when professions act alone. It was also believed that the upcoming generation of new health care professionals are more accepting of new ideas from outside disciplines when compared to established professionals, and that leadership must allow discussion of new ideas in order for creativity to thrive. These concerns were summarized by a social work student:

“...anytime you collaborate with someone else, if you’re open to their ideas and they’re open to your ideas and you can sit and discuss them, lots of things can happen.”

The domain of *newly created professional activities* was then examined from an educational viewpoint to identify common concerns in each participant’s current graduate program. No common trends were found regarding educational concerns around creativity, and all responses exemplified the professional application viewpoint.

**Flexibility.** The domain of *flexibility* referred to the intentional loss of autonomy to promote compromise (Bronstein, 2002). This domain was examined through questions regarding loss of autonomy and understanding of professional roles outside each student's
discipline. This domain was first examined from a professional application viewpoint, and then examined for current education-specific concerns.

From a professional application viewpoint, most participants expressed a need for flexibility in order to promote effective patient care; however this notion was expressed with caution. A majority of respondents reported feeling uncomfortable with a loss of autonomy, also referenced as 'role blurring', and believed each profession had certain expertise that should be distinct. Despite this caution, positive aspects of vague autonomy were also expressed. Benefits of this role blurring included less professional burden related to patient care, and a more evenly distributed risk associated with medical care. Finally, participants believed openness to interdisciplinary team collaboration is based on years of service with new professionals more open to the idea of vague autonomy than experienced professionals. Although participants were accepting of role flexibility, uncertainty was still expressed as shown in this physical therapy student’s response:

"I mean it's frustrating when you're not respected and...I've been through school I have this experience...so when someone who has had...four weeks of training and I've had three years comes in and tells me what to do that's frustrating... I mean if its for the good of the patient...then that's...good."

A nutritional science student also exhibited this same hesitation:

"I think when it comes to nutrition stuff they should put their input and then...the dietitian makes the call. Or...a physical therapist...we say well from my perspective this is what we think this person needs, but the physical therapist ends up being the one that makes the, the call on the care."
This domain also included a question to decipher participants’ understanding of professionals' roles outside of their respective discipline. Participants stated the misunderstanding of professionals’ responsibilities was due to a lack of confidence in one's knowledge on others' roles. What exposure participants did have came from personal experiences (e.g., family or friends employed in other disciplines) rather than educational experiences. Overall, a need was commonly expressed for greater social and educational exposure to other disciplines.

**Collective ownership of goals.** The domain of *collective ownership of goals* explored the commitment of all team members to reaching goals and objectives developed collectively by team members (Bronstein, 2002). This includes taking shared ownership of successes and failures. Questions posed to participants included reflections on other discipline's commitment to working collaboratively, as well as general thoughts on working together cooperatively to establish patient care plans. This domain was examined from a professional application viewpoint, as well as an educational concerns viewpoint.

In regard to professional activities, a commonly expressed belief was uncertainty of other discipline's commitment to working collectively. While all stated to be open to the idea of working with other disciplines, they still hesitantly questioned whether other professionals were equally as accepting. While concerns were expressed over other's commitment to thinking collaboratively, it was believed that working together with other disciplines produced better patient outcomes and enhanced patient care, thus collective ownership of goals should be utilized. These sentiments can be summarized through a medical student’s statement:

"I feel like hopefully in the best interest of the patient they would want to [work collaboratively], but I don't know if all areas necessarily do..."
When hesitation was expressed, it largely stemmed from concerns about the personality of team members, rather than the member’s specific discipline.

From an educational viewpoint, participants often stated that exposure to collaboration and educational experiences dictate an individual's ability to work collaboratively with other disciplines. In fact, some disciplines were believed to work better collectively due to their team-oriented educational background and exposure to working with other disciplines. Some participants believed medicine had the least amount of educational exposure to cross-disciplinary teamwork. It was expressed that medical schools do not necessarily prepare future physicians for committing to working collaboratively. This perception was supported by both a medical student and a physical therapy student respectively:

"I think that the other allied health professionals are a lot better at teamwork...even in teaching I believe other people are taught more to work together, we're not necessarily taught that."

"...doctors are a little bit more solo...I think that as far as like other therapy goes, speech therapy and occupational therapy, I think that we’re all used to kind of working as a team and so we appreciate that we’re doing one part of this whole...."

**Reflection on the process.** The domain *reflection on the process* largely included the idea of, and acceptance of, feedback concerning the process of providing patient care and strengthening team skills (Bronstein, 2002). This domain was assessed through questions regarding acceptance of other disciplines evaluating their future work, as well as acceptance of collectively reviewing roles, stereotypes, and patient care plans. This domain was examined from both a professional application viewpoint and an educational concern viewpoint.
When examining responses in reference to professional activities, a common theme emerged with participants stating to be open to feedback from other disciplines if it was constructive and improved patient care. This belief was stated with some hesitation associated with one’s scope of practice and expertise. As reported by a medical student:

"As long as the comments that are being made are...coming from your area of expertise then it can be...perfectly fine. Then when you kind of jump into what other people are doing, then...there can be some issues."

A nutritional science student also shared:

"As long as it’s constructive I welcome input."

Another common belief regarding reflection on the process in a professional setting was limited time, which was stated to be a hindrance to successful reflection on interdisciplinary teamwork. Because of this limited time, participants expressed that training on roles to encourage understanding of disciplines should occur in the educational setting while time is flexible. A physical therapy student summarized it this way:

“I think it [focus group] is much more feasible in schools, and I think it would be good to...shoot out a new generation of people who are more education with that.”

**Current graduate program preparation for interdisciplinary collaboration.** The final section of the interview was not part of Bronstein’s model domains, but related to current graduate program practices and whether the programs prepared students for interdisciplinary team collaboration. Participants quickly noted that their program provided effective preparation for this collaboration; however this preparation was not an embedded concept of the program and all opportunities for collaboration were voluntary. For example, when asked about her current program, a medical student stated:
"...I think we definitely have a lot of small group work within our medical class, but I do think...I'm not 100% informed on this, but I feel like we might be lacking in some interdisciplinary stuff...outside the medical school."

A nutritional science student matched this statement:

"I think there are certainly opportunities through the program to be exposed to it, I don’t know that we’re specifically, (pause) required to be exposed to it [interdisciplinary training]."

When asked about areas for improvement, study participants expressed the need for improved training on interdisciplinary team collaboration. Ideas to expand this training included additional class time dedicated to understanding other disciplines' roles, workshops and modules on interdisciplinary team collaboration, and greater exposure to faculty members working with other health professions. There was no expression of need for an entire course dedicated to interdisciplinary team collaboration; however the need for a course specific to communication was expressed. To summarize, a majority of participants believed their current program was taking steps to prepare them to be effective team members; however the evidence displaying this preparation was not clearly evident from the prior domain summaries.

**Thematic Findings of Overarching Themes**

Six overarching themes emerged that were neither exclusive to one graduate discipline nor specific to one domain. These themes include gaps in pre-professional education on health care teams, limited understanding of team roles, novice vs. professional work status, influence of personality- vs. profession on teamwork, properties of the work environment, and teamwork based on the patient-centered approach (see Table 4). These themes emerged as either perceived facilitators or barriers to an effective collaborative approach.
**Gaps in pre-professional education.** All participants acknowledged some gaps in their pre-professional education regarding interdisciplinary team collaboration in a health care setting. Most participants expressed very little to no classroom exposure on interdisciplinary team collaboration; however did acknowledge exposure through field-placement or clinical experiences. Opportunities for collaboration outside of field placements were largely under voluntary circumstances, such as through school projects or due to personal experience (e.g., family/friends in health care) rather than mandatory aspects of curriculum. A nutritional science student stated:

"I have a lot of health care professionals in my extended family, and that’s where a lot of my experience comes from."

Furthermore, a lack of established training in graduate programs was often noted, as displayed by a social work student who stated:

"...we don’t see them [other disciplines], in the schools we don’t really collaborate that much...I think down the road we will have a lot more opportunity to talk to other colleagues, and it’s happening now, it’s just...not as embedded in our program."
One voluntary program that did receive mention was the interdisciplinary project called *Open School*. Multiple study participants discussed *Open School*, described as a voluntary, interdisciplinary graduate student team that performed health-related activities at Saint Vincent DePaul, a local non-profit organization located in Cincinnati, Ohio. While growing in popularity, this opportunity remains voluntary and is not yet required by all students in University of Cincinnati health-related graduate programs.

Study participants attributed these educational gaps to challenges related to scheduling interdisciplinary courses in an already demanding discipline-specific curriculum. It was widely stated that time was a concern because curriculum was already heavy with field-specific content that was essential for professional development; however, more training before entering the professional world on working with other disciplines was also vital and needed. Both a nutritional science student and a medical student stated, respectively:

“*We’re so busy with our nutrition specific classes...so I just spend my time doing all of that...we don’t have any...assignments to collaborate with any other graduate students or anything like that.*”

“But going out into the field I think I would definitely get more before I could say, ok, this is, *I know that this is what they’re suppose to be doing.*”

When this issue was probed, study participants stated there was no need for an additional course on interdisciplinary team collaboration; however, it was widely stated that exposure should be early and have a consistent frequency throughout the education experience. This belief is summarized by a medical student:

“*...you end up being a better member of the team the earlier you get exposed to it, the more often you’re exposed to it.*”
Ideas for collaboration offered by participants included modules, panels, job shadowing experiences, provision of job descriptions, collaborative faculty involvement, and workshops. For example, a nutritional science student expressed a desire to have a day dedicated to providing role descriptions and how different disciplines can be used to assist in patient care. Overall, participants believed graduate school curriculum should mirror skills needed for professional activity that included interdisciplinary team collaboration, which was stated to be lacking in their graduate educational experience.

While it was widely expressed that course curriculum on an interdisciplinary team approach was lacking, the profession that contradicted this notion was social work. While mandatory collaborative experiences with other students outside social work were lacking, one social work student expressed to have exposure to curriculum on group dynamics. This individual stated:

“So if you have an interdisciplinary team, chances are the social worker is the one in the group that has the skills to actually run the group, and make sure that everybody in the group contributes and is heard.”

When probed about specific courses, this individual stated:

“...we learn theories of groups, we learn different kinds of group settings....How different group members interact with each other. What to do with difficult group members. How to... manage a group....”

The education system presents a unique opportunity to shape the mindset of health care practitioners to have a positive perception of interdisciplinary team collaboration. By addressing the gaps in graduate education on interdisciplinary team collaboration, the need for further exposure was notably discussed throughout all domains. It was often stated that after exposure,
an understanding developed and led to a greater acceptance of other professions. A medical student and a physical therapy student display this notion, respectively:

"...you really have no idea because that’s not taught in med school... you’re not taught to be the PT [physical therapist] the OT [occupational therapist] the audiologist... so having teams in the hospital where they work together you can actually see what’s happening, you understand the importance of certain consultations."

"... for example speech language pathologists. I thought that they worked with articulation, and I knew that they did swallowing. I had no idea that most of their job is cognitive...until I was actually working with one of them."

Positive exposure to interdisciplinary collaboration was stated to results in positive perceptions of this collaborative approach. Additionally, there was a preference placed on the need for exposure in the educational setting as oppose to the professional setting due to concerns with time and the development of hindering stereotypes. A physical therapy student and a medical student displayed this notion, respectively:

"I think it’s much more feasible in schools, and I think it would be good...I’m not sure if it’s as feasible in practice because that takes away time from patient care, and that’s just...another thing to do and I’m not sure it’s, time wise, if that would be feasible."

"...in everyone’s graduate program or professional program...as you go along you kind of fall into that mindset that they’ve...cast upon you...nurses start thinking a certain way after a couple years of their training, I’m sure dietitians start thinking a certain way, and I know for sure med students, they get, you change a lot in your training..."

Overall, the desire for educational exposure to interdisciplinary team collaboration was present, yet was believed to be lacking in current health education programs.
Limited understanding of team roles. The second overarching theme threaded across domains was an incomplete understanding of other disciplines’ roles, which was likely related to students' perceived gaps in pre-professional education. Most study participants stated to have an incomplete understanding of the skills sets of other professions, and believed students and professionals outside their field reciprocated this lack of role understanding. Poor role understanding was also associated with trust issues, since greater knowledge and understanding of discipline-specific roles and skills often results in greater trust when collaborating with other disciplines. A medical student and a social work student respectively stated:

"We need to understand how much people actually know... I think you just don’t trust them because you don’t know how they were educated, that’s a big problem."

"I think once you get to know a person you have a level of trust.... I think I would have to show my skills show my ability to do the job well in order to get that trust."

Role uncertainty also emerged when participants reflected on both receiving and giving feedback. While the idea of feedback was widely accepted, it was conditionally taken and given with caution. Study participants were quick to state their comfort in giving positive feedback; however were cautious with providing negative or critical feedback to others outside their discipline. A nutritional science student nicely summarizes this sentiment:

"I think I would be very quick to give positive feedback and I don’t think that I would ever criticize a nurse on the way she handled a situation, because I am not a nurse and I... don’t understand the ins and outs of what led into that...decision."

This insecurity of role understanding was also widely voiced when asked to reflect on loss of autonomy in order to function as a team. Students conveyed role uncertainties related to confusion with scope of practice. This reluctance to fully embrace vague autonomy took on a
'who am I to judge' mentality since each discipline was trained in a different manner. Study participants expressed to not possess adequate knowledge to cross into other discipline’s assumed responsibilities, and vice versa. A medical student stated:

"Sometimes I feel like people kind of like step on other peoples toes...part of it I think comes from not necessarily starting out in a team environment."

Overall, it was widely expressed that full understanding of other disciplines' roles were not clearly known resulting in concerns with autonomy, feedback, and trust. In general, this lack of understanding was seen as a barrier to effective interdisciplinary team collaboration, and more collaborative opportunities were needed to prepare for future positions as part of an interdisciplinary team.

**Novice vs. professional work status.** Acceptance and utilization of interdisciplinary team collaboration was stated to be present in newer professionals, and lacking in practiced professionals across disciplines. Participants stated the new generation of professionals has a greater likelihood of working collaboratively in comparison to more experienced health care professionals. It was believed established health care professionals might not be open to the idea of interdisciplinary team collaboration because they did not fundamentally train in a team environment. Furthermore, study participants stated that the use of cross-disciplinary teams in a health care setting was evolving toward greater acceptance from newer professionals that are excited about collaboration with other fields. A nutritional science student and a medical student stated, respectively:

“...I think it’s always going to be around, but I think its definitely changing...you can kind of tell with...younger professionals entering into the field that there is a little bit more
collaboration so that, I think some of that stuff is going to be kind of phased out as people retire.”

“... some of the physicians who...who maybe their older so then they’ve been working for longer and they didn’t necessarily start out in such a team setting....”

Tolerance of collaboration based on years of experiences (novice vs. professional status) was expressed as a belief across all explored domains. Professionals beginning a career were perceived to be open to losing a degree of autonomy to promote team collaboration, open to feedback for improved patient care, and more willing to allow other professionals to state input on patient care plans. In general, experienced and established professionals were seen as a barrier to effective collaboration between disciplines while newer professionals beginning in the field were seen as catalyst to effective interdisciplinary team collaboration.

**Influence of personality vs. profession on teamwork.** The fourth dominant theme to emerge across domains was the idea of personality vs. profession. Many participants stated the desire to work in a collaborative team, to accept feedback from other disciplines, and to be open to other team members’ opinions was based on an individual’s personality not the discipline in which they worked. A nutritional science student noted:

"I think it really depends on the person, not so much the discipline. I think there’s people in all disciplines who would be willing to work on teams, and I think there are people in all disciplines who feel you might be stepping on their toes."

While this was the common theme seen throughout multiple interviews, the field of medicine was one exception to this perception. Two individuals believed medicine might still be wary of the idea of collaboration when compared to other professions. This notion was expressed by a physical therapy student and a medical student respectively:
“...doctors are a little bit more solo, they know that they need the help of others but what they say goes...”

“...I mean you’re taught you’re the doctor this is your (emphasis on “your”) patient, you’re managing this...”

The aforementioned comments further confirm the known separation between the profession of medicine and the allied professions, which may explain why the field of medicine is still slightly behind the other health professions in the acceptance of interdisciplinary team collaboration. These findings across domains display a hindering or promoting factor to interdisciplinary team collaboration may be an individual’s personality not necessarily their profession.

**Properties of the work environment.** Study participants stated influential factors of interdisciplinary team collaboration to include leadership, organizational values, and the mindset of team members, all of which construct the work environment. Participants believed the success or failure of the collaborative approach was dependent on the mindset of the leader of the team, most often stated to be the physician. This idea of a hierarchy was stated to be evident and intertwined in effective collaboration in a health care setting. If the individual leading the team encouraged interdisciplinary communication, effective team collaboration would occur. A social work student stated:

"If the person at the top of the chain is in any way hesitant to involve other people, the teamwork thing will breakdown, and it will cause stress on all levels."

Study participants also expressed collaboration to be meaningfully shaped by the culture of the governing organization. Participants believed the value and emphasis that organizations place on collaboration dictates the success of interdisciplinary teams. For example, if the organization allocated time for continuing education or team meetings to support
interdisciplinary team collaboration, it is more likely effective teams will be utilized in practice. A physical therapy student displayed this belief by stating:

"I don’t know if I would say it’s by profession. So much as it’s by facility...if you walk into certain hospitals...that have a great team approaches and good relationships...”

Moreover, participants believed the mindset of each team member plays a vital role in successful implementation of collaboration. Study participants stated if team members are intolerant of feedback and closed to other disciplines’ ideas, successful team collaboration is unlikely to occur. Participants also expressed that all disciplines must have the opportunity to provide input on patient care plans in order to produce proper patient care. For example a medical student and a social work student stated, respectfully:

“...if you have people who are actually willing to be a team, and take constructive criticism...people who are willing to speak up and give their input...”

“...anytime you collaborate with someone else, if you’re open to their ideas and they’re open to your ideas and you can sit and discuss them, lots of things can happen.”

Overall, it was believed that the work environment (i.e., the leadership overseeing operations, the values of organizations, and the mindset of the team members) impacted overall interdisciplinary team effectiveness.

**Patient-centered approach.** The sixth and final dominant theme to emerge across domains was the importance of a patient-centered approach to health care services. It was common for participants to state they would tolerate personally uncomfortable situations if it were in the best interest of the patient. Many were cautious about giving and receiving feedback outside their discipline; however were open to the idea if it improved patient care. A physical therapy student voiced discomfort with providing feedback to other disciplines; however stated:
“...ultimately your goal is the best for the patient, so if you know something that they don’t know, then its...what needs to be done I guess. So I think if it needed to be done I could do it.”

Surrendering a degree of autonomy was another area of professional discomfort noted to be necessary for proper patient care. The acceptance of role blurring was stated to be essential to patient services, thus participants were willing to give up a degree of autonomy if it resulted in better patient care. When asked about concerns with flexibility and allowing for vague autonomy, a physical therapy student stated she would be more comfortable allowing for loss of autonomy if it resulted in improved patient care:

“I mean if it’s, if it’s for the good of the patient, and, and they really do have better ideas...”

This belief on flexibility was stated to stem from the current complexity of patient conditions. Participants believed the large amount of knowledge needed to provide effective patient care could not be possessed by a single person and that effective patient care develops from utilization of all disciplines. Overall, a patient-centered approach to medical care was stated to be a major catalyst for successful collaborative teamwork.
Chapter 5: Discussion

The findings from this study shed light on current collaborative practices, perceptions of graduate students on interdisciplinary team collaboration, and the possibilities for improvement within our current health education system. One of the overarching themes was participants' perceived gaps in their pre-professional education on interdisciplinary team collaboration. While there is substantial literature on current teamwork practices in health care (Blue et al., 2010; Hall & Weaver, 2001) and the need for interdisciplinary cooperation (IOM, 2001), there is little published research on how graduate health care students view cross-disciplinary teamwork prior to joining a professional health care environment.

Although federal and health care agencies (e.g., The Joint Commission, The Institute of Medicine) are now facilitating greater opportunity for teamwork in health care settings due to funding and accreditation pathways, graduate health care programs have not yet fully translated these concerns into interdisciplinary team curriculum and education. As this current study shows, noteworthy gaps in the educational preparation of health care professionals regarding working collaboratively across disciplines are still present. Because of this, there is a significant need to discover new methods to improve the collaborative approach.

Findings from this study further inform Bronstein's two-part model of interdisciplinary collaboration. Bronstein uses five components (part one of model) of effective interdisciplinary collaboration (i.e., interdependence, newly created professional activities, flexibility, collective ownership of goals, and reflection on the process) to demonstrate successful interdisciplinary team collaboration (Bronstein, 2003). These components are affected by influences (part two of model) on interdisciplinary team collaboration (i.e., understanding of professional roles, personal
characteristics, organization/structural characteristics, and a history of collaboration) with positive exposure to these influences promoting effective collaboration (Bronstein, 2003).

Three of the six overarching themes reported in this study further support Bronstein's two-part model of interdisciplinary collaboration. First, this study confirms Bronstein's model influences, with student responses mirroring a need for understanding of professional roles (limited understanding of team roles), the need for an open mindset toward collaboration (properties of the work environment), the need for organizational value associated with working collaboratively (properties of the work environment), and the need for previous exposure to shape the understanding of team collaboration (gaps in pre-professional education). Furthermore, the presence of Bronstein's five model domains of interdisciplinary collaboration was validated by student responses with recognition of the importance of interdependence, newly created professional activities, flexibility, collective ownership of goals, and reflection on the process. Finally, while Bronstein developed this model to depict collaboration between the field of social work and other health care disciplines, findings from this study suggest Bronstein's two-part model on interdisciplinary collaboration may be applicable to all health care disciplines regarding interactive teamwork.

In addition to adding further support to Bronstein's work, this study extends the model by adding major concepts related to interpersonal team functioning. Findings from this study suggest that the interpersonal work environment is vital to collaboration, specifically when examining leadership and trust. While briefly discussed by Bronstein in part two of her model (influences on interdisciplinary collaboration), findings from this study suggest these factors play a fundamental role in establishing effective interdisciplinary team collaboration. This insight on leadership adds to Bronstein's model, and is supported by Edmondson, Kramer, and Cook (2004)
who found supportive leaders who coached team members to participate in team interactions ensured the establishment of psychological safety (comfort in one's own actions). The current study also further extends Bronstein's model by placing a greater emphasis on the element of interpersonal trust, or trusting other's actions. Interpersonal trust was embedded in the discovered key themes of limited understanding of team roles and gaps in pre-professional health education. Edmondson (2003) also recognizes trust as a critical aspect of team dynamics acting as a facilitator of organizational relationships. Edmondson’s (2003) research finds "trust and respect in horizontal group relationships promotes team psychological safety" (p.18). By promoting psychological safety through effective leadership and trust, comfort of interdisciplinary team collaboration may be realized. In brief, findings from this study expand Bronstein's operative model by placing greater emphasis on interpersonal factors presented by Edmonson.

Findings from this study also reflect existing literature concerning barriers to improving the interdisciplinary health education system. First, this study supports Hall and Weaver (2001) who observed major gaps in the health education system in regard to interdisciplinary team preparation. As one of this study’s six overarching themes, cross-disciplinary preparation is lacking in pre-professional health education and continues to be a major concern in developing effective interdisciplinary team collaboration. Additionally, previous literature suggests student course load is heavy with discipline-specific content, with little room or time for additional courses on the collaborative approach (Gardner et al., 2002; Greiner & Knebel, 2003; Rafter et al., 2006). This idea is supported by this study’s findings, with students expressing little room for curriculum on interdisciplinary content due to the demands of field-specific course work.
This study also expands existing literature by adding graduate student perceptions to the field of interdisciplinary team collaboration. Little is known about how students perceive a future in an interprofessional environment, and this study provides a glimpse into the thoughts, beliefs, and concerns of future health care practitioners. In order to better understand the effectiveness of current practices, student perceptions are vital and provide insight on strengths and weaknesses found in the current health education system. Moreover, student recommended methods to improve the collaborative aspect of pre-professional health education was provided in this study. Current literature suggests a paucity of evidence-based methods for the education of interdisciplinary team collaboration (Gardner et al., 2002). Furthermore, research displays a need for a more focused approach to curriculum development on interdisciplinary collaboration due to the limited financial resources and restricted faculty availability (Greiner & Knebel, 2003). The perspectives of graduate students in this study offer plausible educational solutions to these limitations in order to encourage collaborative team skill development. By eliciting student input on how to improve the health education system, students may take ownership and feel a connection to innovative programs offered by health education centers on interdisciplinary team collaboration.

In addition to supporting and extending the current literature, the inductive analysis approach utilized in this study fostered the development of two models concerning gaps in pre-professional health education. This study found a majority of concerns expressed by graduate students relating to interdisciplinary team collaboration relate to educational gaps. This major theme appears to be at the core of multiple salient domains: limited understanding of roles, personal team member mindset (work environment), and novice vs. professional work status. This discovery provides the opportunity to recommend possible improvements to health
education in efforts to produce better results in the future. The first developed model lies in defining the production of trust in a health care setting. This definition of trust is then expanded to create a second model, which was developed to promote effective interdisciplinary health education for pre-professional health care graduate programs.

Information obtained from this study suggests an imperative need to develop trust among health care disciplines. Fears concerning collaboration may be directly bound to the idea of trust. Examination of this study's findings shows that trust will likely increase from exposure to other disciplines' skills and abilities, from a comprehensive understanding of educational backgrounds for each discipline, and from an understanding of roles for each team member (see Figure 2). These three factors appear to be vital to the development of trust in a health care setting, and could be realized in pre-professional health education. The promotion of trust through education would likely lessen common concerns expressed by participants in this study in relation to interdisciplinary team collaboration in a health care setting.

Figure 2. Formation of Trust in an Interdisciplinary Health Care Team
Findings from this study were also developed into a second model for pre-professional, interdisciplinary health education (see Figure 3). First, it was stated that exposure to interdisciplinary team collaboration should occur early in the educational experience, and on a regular basis throughout the completion of each program. One recommendation for early introduction to team collaboration is to include this concept in program orientations to supplement each discipline-specific orientation. This would allow for a foundational presentation of the collaborative approach. Furthermore mandatory interprofessional panels, workshops and modules could be added to existing discipline-specific curriculum each term to promote consistent exposure to collaboration. An example of a possible workshop would be to invite faculty from all health care disciplines to discuss current interdisciplinary projects and research, followed by a networking opportunity upon conclusion. This would promote not only exposure to professional interdisciplinary workings, but also provide opportunities for social exposure to other disciplines.

Leadership and communication were two areas reported as primary concerns regarding team dynamics, thus more knowledge on these areas must be realized to develop functioning teams. In order to promote these concepts, elective curriculum aimed at leadership and communication could be added for all health-related disciplines with a determined minimum amount of hours required. For example, adding a communication course offering interdisciplinary team collaboration through video conferencing could foster innovative technical practices and overcome the barrier of physical distances between discipline-specific schools. Finally, exposure to other disciplines should be both professional and social to allow for greater team dynamics. By allowing professional exposures (e.g., field placement and clinical experience) a greater understanding of professional roles, skills and abilities may develop, and
by encouraging social interaction between disciplines, personal relationships can develop allowing for commonalities to be discovered helping to lessen the distinction of professions. One recommended way to promote social interaction would be to have quarterly scheduled social events including graduate students from all disciplines in health-related fields.

This proposed model focuses on components needed for pre-professional health education to foster the development of effective team members. By applying this comprehensive model to graduate studies in health-related programs, a greater understanding of other disciplines could be gained promoting trust and enhancing the interdisciplinary team experience. Overall, the graduate, pre-professional years of education provide a window of opportunity to embed positive feelings toward interdisciplinary team collaboration in future health care practitioners.

**Figure 3: An Educational Model for Interdisciplinary Team Collaboration**
While providing important insight on the perceptions of graduate students in regard to interdisciplinary collaboration, this study is not without limitations. First, the small sample size may not provide enough strength for generalized assumptions on interdisciplinary collaboration. Furthermore, the study population represented only four health disciplines, thus is not truly representative of a clinical interdisciplinary team in a health care setting. In addition, all study participants were female, providing a gender biased viewpoint and should be considered when applying the data. This study was also voluntary and individuals who chose to participate may present bias due to greater interest in interdisciplinary collaboration than the average health care graduate student. Study participants also knew that the study’s researcher was a registered dietitian with a vested interest in clinical team collaboration, which may have prevented subjects from fully expressing any concerns related to allied health. Finally, this study population consisted of individuals from one university (i.e., the University of Cincinnati), thus may not represent the sentiment of graduate students in health-related programs at other health education centers.

Findings from this study highlight several opportunities for future research. First, further exploration on the effectiveness of current educational practices is needed to find areas for improvement in graduate curriculum. For example, if physical barriers continue to block collaboration, the exploration of using video conferencing to communicate across disciplines may possibly bridge this gap. Moreover, while the evolution of health care teamwork was discussed, it is unknown how much effort is currently placed on changing curriculum within health education centers to promote interdisciplinary team collaboration. One proposed method for further research is to compare previous curriculum with current curriculum in health education to determine if advances in interdisciplinary, collaborative education have occurred.
There is also significant need to further explore the educational approach to teaching interdisciplinary team collaboration in order to establish evidence-based practices. One possibility is through implementation of different pilot programs consisting of workshops, modules, or faculty panels. Of note, study participants cited new coursework on team collaboration to be an unnecessary approach; however the desire for more exposure was quite evident. Because of this, research should be explored on effective way to present information on collaboration through methods outside of traditional means. Finally, studies on trust development in a health care setting should be explored to determine the best educational methods to produce trust during pre-professional health education.

In conclusion, interdisciplinary collaboration is vital to patient outcomes and effective patient care. Examining views of graduate students provides an excellent opportunity to obtain pre-professional concerns, as well as direction on how to improve the health education system for future generations of health professionals. Students provide a viewpoint not yet shaped by professional biases and should be taken into consideration when planning health education programs. Findings from this study magnify the importance of education and exposure, trust, and a patient-centered approach for effective interdisciplinary team collaboration in a health care setting (see Figure 4). In order to produce a future health care workforce with positive perceptions on interdisciplinary team collaboration, fundamental understanding and acceptance of other disciplines must begin at the base: the graduate educational level.
Figure 4. *Elements of Effective Interdisciplinary Team Collaboration*

- **Education and Exposure**
- **Effective Interdisciplinary Team Collaboration**
  - Trust between Team Members
  - Patient-Centered Approach
References


The Joint Commission. (2010b). Approved: Revisions to medical staff standard MS.01.01.01. *Joint Commission Perspectives*, 30(4)


Appendix A.

Resent-From: <bairdkr@mail.uc.edu>
From: Laura Bronstein <bronst@binghamton.edu>
Subject: Re: Request for permission: Index of Interdisciplinary Collaboration
Date: August 21, 2012 10:24:38 AM EDT
To: ”Baird, Kelly (bairdkr)“ <bairdkr@mail.uc.edu>

Hi Kelly,

I am happy to have you utilize the IIC. And I would be very interested to see your final product. As you move forward, please feel free to let me know if you have any questions.

Good luck with your research,
Laura

On 8/20/12 10:31 PM, Baird, Kelly (bairdkr) wrote:

August 20, 2012

Dr. Laura R. Bronstein
Q Pod, Engineering Building
Binghamton University
State University of New York
4400 Vest A Park East
Binghamton, NY 13902
(607) 777-4162
lbronst@binghamton.edu

Dear Dr. Laura R. Bronstein,

I am a graduate student at the University of Cincinnati working toward a Master of Public Health degree, and am in the process of developing my capstone project on the perceptions of interdisciplinary team collaboration in health care of graduate students in health related programs. I am conducting my research under the guidance of William Mase Dr.P.H., M.P.H., M.A., program director of the Master of Public Health program at the University of Cincinnati.

I am writing to seek your permission to use your instrument tool, Index of Interdisciplinary Collaboration, in my research study. I would like to use it under the following conditions:

- I will use the survey only for my research study.
- I will be using your survey to develop interview questions for my qualitative research study, modifying the questions to reflect other health care professions (e.g. medical students, nursing students, dietetic students, etc.).
- I will be using your survey to develop interview questions for my qualitative research study, modifying the questions to reflect a future tense versus the current present tense.
- The modified content will be clearly indicated as adapted, and acknowledgement will be provided in the form that you require.
- If desired, a copy of my capstone study will be sent to you upon completion.

Thank you for considering my request. If you require further information regarding my use of your instrument tool, please contact me via the information listed below. If you have questions you may also contact Dr. Mase at (513) 558-2710 or by email at William.Mase@uc.edu. I look forward to hearing from you.

Sincerely,
Kelly Baird
Appendix B.

UNIVERSITY OF CINCINNATI

INSTITUTIONAL REVIEW BOARD PROTOCOL APPROVAL NOTIFICATION
FOR STUDIES GRANTED EXPEDITED APPROVAL

PRINCIPAL INVESTIGATOR:  Kelly Baird, RD, LD

PROTOCOL: IRB #12-09-04-03E – Perceptions Regarding Interdisciplinary Collaboration of Graduate Students in Health-Related Graduate Programs

   Includes informed consent  Yes
   Includes recruitment     Yes
   Informed consent requirement waived  No
   Survey materials constitute abbreviated consent  No
   Includes HIPAA Waiver   No

Sponsor: Principal Investigator
FWA #: 00003152

The approval for this research activity expires on:  
September 20, 2013

1. The federal regulations at 45 CFR 46.110 which allow for the expedited review procedure, require that the IRB adopt a method for keeping all members advised of research proposals which have been approved under this procedure. The full Board will be notified of the expedited approval status of your study at its next convened meeting. You will be notified in writing in the event the Board disagrees with this expedited approval decision.

2. For adverse event reporting requirements, please refer to UC Policy II.02.

3. The period of approval of this research project is stated above. In order for a project to continue with IRB approval beyond the expiration date, a progress report form must be filed with the Institutional Review Board on at least an annual basis, and sometimes more frequently at the discretion of the Board.

4. There may be no change or addition to the project, or changes of the investigators involved, without prior approval of the IRB.

5. You are required to modify this study, subject to IRB approval, if subsequent information regarding any drug, device or procedure utilized in the study is received from the manufacturer or any other reliable source that could reasonably increase or alter potential harm to subjects. The informed consent statement must be modified to include this new information or an addendum must be prepared as a means to assure subject notification. In cases where the subject has completed the study, the modification or addendum is only necessary if the additional information received could impact the subjects in the future.

   Chairperson (or Designee), Institutional Review Board

*The attached consent is stamped with the period of IRB approval. Please copy this ICS document and use for all subjects entered into the study.

Please note: This approval is through the U.C. IRB only. You may be responsible for reporting to other regulatory officials (e.g., VA Research and Development Office, UC Health-University Hospital). Please check with your Institution and Department to ensure you have met all reporting requirements.

Statement regarding International Conference on Harmonisation and Good Clinical Practices

The University of Cincinnati Institutional Review Board is duly constituted (fulfilling FDA requirements for diversity), has written procedures for initial and continuing review of research studies; prepares written minutes of convened meetings, and retains records pertaining to the review and approval process; all in compliance with requirements defined in 21 CFR Parts 50, 56 and 312 Code of Federal Regulations. This institution is in compliance with the ICH GCP as they correspond to FDA/DHHS regulations.

University of Cincinnati Institutional Review Board Office
51 Goodman Dr., Suite 300, ML #0567, Cincinnati, Ohio 45267-0567
Telephone 513-558-8259, Fax 513-558-4111

http://www.researchcompliance.uc.edu/irb/

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Appendix C.

Dear (Department Chair),

I am a graduate student at the University of Cincinnati working toward a Master of Public Health degree, and am in the process of developing my thesis project on the perceptions regarding interdisciplinary collaboration in health care of graduate students in health-related programs. I am conducting my research study under the guidance of William Mase Dr.P.H., M.P.H., M.A., program director of the Master of Public Health program at the University of Cincinnati. IRB approval was received on (date).

I am writing to you to request assistance in contacting potential study participants: students in your graduate program. I am seeking your advice on the best way to contact graduate students in your program for recruitment purposes. Overall, I will need one (1) student from your program to participate in a one-time interview for this study. For confidentiality purposes, I do not wish you to provide recommended student names; rather I am seeking the best way to contact students in your program in order to recruit a study participant.

If you require further information regarding my request, please contact me via the information listed below. If you have questions you may also contact Dr. Mase at (513) 558-2710 or by email at William.Mase@uc.edu. I look forward to hearing from you, and thank you for your assistance.

Sincerely,
Kelly Baird

Kelly Baird RD, LD
Graduate Student
University of Cincinnati College of Medicine
Department of Environmental Health
Phone: (513) 313-6677
Email: Bairdkr@mail.uc.edu
Appendix D.

Hello,

I am a graduate student at the University of Cincinnati working toward a Master of Public Health degree, and am in the process of developing my thesis project on the perceptions regarding interdisciplinary collaboration in health care of graduate students in health-related programs at the University of Cincinnati.

I am looking for research study participants to participate in a one-time interview regarding your perceptions regarding interdisciplinary collaboration as a future health care professional. Eligibility requirements are as follows:

- Study participants must be part-time or full-time, graduate students at the University of Cincinnati.
- Study participants must be 18 years of age or older.
- All study participants must be fluent in the English language.
- Study participants must be enrolled in a traditional graduate program taking courses on location at the University of Cincinnati; not enrolled as a graduate student taking part in a distance-learning program.
- Student participants must have no prior experience working as a professional in their current field of study (i.e. cannot be a registered dietitian currently working as a registered dietitian and in graduate school for a M.S. in Nutritional Sciences). This is in order to eliminate potential biases established from previous work experience.
- This study is open to all races, ethnicity, and genders

Participation, and all information gained during the interview will be kept confidential. If you have interest in participating in this research study, please contact me by email (Bairdkr@mail.uc.edu) stating your interest. Thank you for considering this request, and I look forward to hearing from you.

Sincerely,
Kelly Baird

Kelly Baird RD, LD
Graduate Student
University of Cincinnati College of Medicine
Department of Environmental Health
Email: Bairdkr@mail.uc.edu
Title of Study:
Perceptions Regarding Interdisciplinary Collaboration of Graduate Students in Health Related Graduate Programs

Introduction:
You are being asked to take part in a research study. Please read this paper carefully and ask questions about anything that you do not understand.

Who is doing this research study?
The person in charge of this research study is Kelly Baird of the University of Cincinnati (UC), graduate student in the Department of Environment Health. She will be guided in this research by Dr. William Mase. There may be other people on the research team helping at different times during the study.

What is the purpose of this research study?
The purpose of this research is to study the perceptions of graduate students in health-related graduate programs on professional concerns regarding working in an interdisciplinary environment. Knowledge gained from this qualitative, exploratory study will help lay the groundwork for future research on interdisciplinary collaboration.

Who will be in this research study?
About fourteen (14) people will take part in this study. You may be in this study if:

- You are a full-time graduate student at the University of Cincinnati
- You have not previously, nor are currently working as a professional in your field of study
- You are eighteen (18) years of age or older
- You must be fluent in the English language
- You are enrolled in a traditional graduate program in a health-related discipline, taking courses on location at the University of Cincinnati; not enrolled as a graduate student taking part in a distance-learning program.
- This study is open to all races, ethnicity, and genders

What will you be asked to do in this research study, and how long will it take?
You will be asked to participate in a one-time interview regarding your perceptions of working with an interdisciplinary team in a health care environment. It will take about one (1) hour to complete this interview. The interview will take place at the University of Cincinnati, and interviews will be recorded by audio device. Participants who do not
wish to be audio recorded will not be able to participate in this research study.

**Are there any risks to being in this research study?**
It is not expected that you will be exposed to any risk by being in this research study. However, if some questions are making you feel uncomfortable, you can refuse to answer any questions that you do not want to answer.

**Are there any benefits from being in this research study?**
You will probably not get any benefit by being in this study, however, participating in this study may help educators and health care professionals better understand concerns related to working in interdisciplinary teams in a health care setting.

**What will you get because of being in this research study?**
You will not receive financial compensation for this research study; however, you do not have to pay anything to be a part of this study.

**Do you have choices about taking part in this research study?**
This study is a voluntary study, and if you wish to not participate in this study you may decline. By declining to take part in this survey you will not be included in the research.

**How will your research information be kept confidential?**
Information about you will be kept private by:
- Information related to this study will only be accessible by the study’s research team. Your information will never be shared with faculty or administrative personnel at the University of Cincinnati.
- All research materials will be kept on a password-protected computer/data file.
- Taking part in this research study will not negatively or positively affect your class rank nor grades, and is completely separate of all academic-related activities to your personal area of study and graduate program.
- The data from this study may be published, but you will NOT be identified by name.

Agents of the University of Cincinnati may inspect study records for audit or quality assurance purposes.

Your identity and information will be kept confidential unless the authorities have to be notified about abuse or immediate harm that may come to you or others. All information sent via internet or e-mail can not be guaranteed secure.

**What are your legal rights in this research study?**
Nothing in this consent form waives any legal rights you may have. This consent form also does not release the investigator, the institution, or its agents from liability for negligence.
What if you have questions about this research study?
If you have any questions or concerns about this research study, you should contact Kelly Baird by phone at 513-313-6677 or by email at Bairdkr@mail.uc.edu. Or, you may contact Dr. William Mase, research advisor at 513-558-2710 or by email at William.Mase@uc.edu.

The UC Institutional Review Board reviews all research projects that involve human participants to be sure the rights and welfare of participants are protected.

If you have questions about your rights as a participant or complaints about the study, you may contact the UC IRB at (513) 558-5259. Or, you may call the UC Research Compliance Hotline at (800) 889-1547, or write to the IRB, 300 University Hall, ML 0567, 51 Goodman Drive, Cincinnati, OH 45221-0567, or email the IRB office at irb@ucmail.uc.edu.

Do you HAVE to take part in this research study?
No one has to be in this research study. Refusing to take part will NOT cause any penalty or loss of benefits that you would otherwise have. You may skip any interview question that you do not want to answer. You may start and then change your mind and stop at any time. To remove yourself from this study, you should tell the study’s PI, Kelly Baird by calling 513-313-6677 or by emailing her at Bairdkr@mail.uc.edu. If you have any additional concerns regarding this study, you may contact Dr. William Mase, academic research advisor, by calling 513-558-2710 or by email at William.Mase@uc.edu.

Agreement:
I have read this information and have received answers to any questions I asked. I give my consent to participate in this research study. I also understand that the interview I will take part in will be audiotaped. I will receive a copy of this signed and dated consent form to keep.

Participant Name (please print) ________________________________________________

Participant Signature________________________________________________________ Date ______

Signature of Person Obtaining Consent ____________________________ Date ______
Appendix F.

Interview Script
Adapted from Laura R. Bronstein’s *Index of Interdisciplinary Collaboration*

PI:

The purpose of this interview is to define common concerns or ideas about interdisciplinary collaboration from graduate students in health-related fields of study. The hope is to take these concerns and properly develop curriculum to improve graduate education courses related to interdisciplinary collaboration for future health care professionals in order to improve patient care.

I’m going to ask you questions related to interdisciplinary collaboration as a future health care professional. All questions are related to interdisciplinary collaboration and team efforts in a health care setting. All questions are hypothetical, and should be examined for how you feel about the content of the questions as a future health care professional. Please try to only think about how you WILL react as a future health care professional, rather than how you HAVE reacted in past situations.

If at any time you feel uncomfortable with a question or do not know how to answer a question, it is appropriate to ask to skip that question and continue with the interview. If at any time you feel uncomfortable with the interview, you have the right to stop the interview and withdraw from this research study.

Do you have any questions before we begin?

(Allow time for questions)

PI:

Introductory Questions:
1. What are your thoughts on interdisciplinary team work in health care?
2. What do you feel are the benefits of teamwork in a health care setting?
3. What do you feel are the risks of teamwork in a health care setting?
4. Would you be willing to work on an interdisciplinary team in the future?
   a. If yes, what do you hope to gain from this experience?
   b. If no, what are your main concerns?
Interdependence:
1. As a future health care professional, how do you feel about utilizing other professionals for their particular expertise? Do you feel its necessary for effective patient care?
2. How do you feel about giving feedback to other professionals in an interdisciplinary team?
3. How do you view teamwork with other professionals in a health care setting?
4. What are your concerns, if any, about communication between different disciplines in health care?
5. What concerns do you have about other professionals understanding your role as a health care professional in a team environment? Do you feel graduate students in different disciplines have a clear understanding of the roles they will play as future health care professionals?

Newly Created Professional Activities:
1. How do you feel about the notion that interdisciplinary work improves the development of innovative new programs? Agree? Disagree?
2. Reflect on this statement: “Working with colleagues from other disciplines will lead to outcomes that we would not be able to achieve alone.” Do you agree? Disagree? Why?
3. What efforts, if any, do you think health care organizations will do to improve interdisciplinary collaboration when you begin practicing as a health care professional?

Flexibility:
1. How do you feel about taking on tasks outside your future job description when it appears to be important?
2. How do you feel about sacrificing a degree of autonomy to support collaborative problem solving?
3. How would you handle professional colleagues from other disciplines going outside their job description to complete a team task?
4. What is your understanding of other health care discipline’s role in a team environment?
5. What will be your role as a (Field of Study) in an interdisciplinary team?

Collective Ownership of Goals:
1. What thoughts or ideas do you have about professionals from your discipline and other disciplines’ commitment to working together as a collective unit?
2. How do you see yourself working through conflict resolution in interdisciplinary team? Do you feel other graduate students in different disciplines will be prepared and committed to handling conflict in an interdisciplinary team?
3. Do you see the environment of an interdisciplinary team being an open atmosphere with the freedom to be different and to disagree? Why do you feel this way?
4. How do you feel about colleagues form other disciplines collectively participating in patient treatment plans?
Reflection on Process:
1. How do you feel about colleagues from other health care professions evaluating your future work?
2. How do you feel about evaluating your future colleagues work?
3. What are your thoughts on colleagues from other disciplines and yourself, talking together about professional similarities and differences, including role competencies and stereotypes?
4. Describe the importance of professionals from other disciplines discussing the degree to which each of you should be involved in a particular case?

Conclusion (related to current graduate program):
1. Do you feel your current graduate program has prepared you for a future of interdisciplinary collaboration?
   a. If yes:
      i. Please describe courses/experiences your program has provided to prepare you.
   b. If no:
      i. What do you think is missing from your program?
      ii. What would you like to see added to your program to prepare you, according to your current concerns?

Is there anything else you would like me to know about your perceptions regarding interdisciplinary collaboration as a future health care professional?

Member Check

(Allow time for reflection and questions)

Thank you for your time today. I appreciate your willingness to help with this study and the feedback you provided. If you have any questions regarding this research study, please feel free to contact me using the contact information listed on the informed consent form.
Appendix G

Dr. Laura Bronstein's (2002) *Index of Interdisciplinary Collaboration*

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I utilize other (non-social work) professionals for their particular expertise.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I consistently give feedback to other professionals in my setting.</td>
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<td>5</td>
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<tr>
<td>3. Other (non social work) professionals in my setting utilize social workers for a range of tasks.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Teamwork with professionals from other disciplines is not important in my ability to help clients.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. My colleagues from other professional disciplines and I rarely communicate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. The colleagues from other disciplines with whom I work have a good understanding of the distinction between my role and their role(s).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>7. I communicate in writing with my colleagues from other disciplines to verify information shared verbally.</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. My colleagues from other disciplines make inappropriate referrals to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I can define those areas that are distinct in my professional role from that of professionals from other disciplines with whom I work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I view part of my professional role as supporting the role of others with whom I work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. My colleagues from other disciplines refer to me often.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. Cooperative work with colleagues from other disciplines is not a part of my job description.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>13. I utilize informal methods of communication (i.e. social networks, lunchtime, etc.) to communicate with my colleagues from other disciplines.</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. My colleagues from other professional disciplines do not treat me as an equal.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. My colleagues from other disciplines believe that they could not do their jobs as well without the assistance of social workers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>16. Incorporating views of treatment held by my colleagues from other disciplines improves my ability to meet clients' needs.</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. Distinct new programs emerge from the collective work of colleagues from different disciplines.</td>
<td>1</td>
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</tr>
<tr>
<td>18. Organizational protocols reflect the existence of cooperation between professionals from different disciplines.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. Formal procedures/mechanisms exist for facilitating dialogue between professionals from different disciplines (i.e., at staffings, inservice, rounds, etc.).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. I am not aware of situations in my agency in which a coalition, task force or committee has developed out of interdisciplinary efforts.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>*21. Some meetings, committees etc. in my agency/organization are consistently run jointly by social workers and other professionals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22. Working with colleagues from other disciplines leads to outcomes that we could not achieve alone.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23. Creative outcomes emerge from my work with colleagues from other professions that I could not have predicted.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24. I am willing to take on tasks outside of my job description when that seems important.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25. I am not willing to sacrifice a degree of autonomy to support cooperative problem solving.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26. I utilize formal and informal procedures for problem-solving with my colleagues from other disciplines.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27. The professional colleagues from other disciplines with whom I work stick rigidly to their job descriptions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28. My non-social work professional colleagues and I work together in many different ways.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>*29. Relationships with my colleagues sustain themselves despite external changes in the organization or outside environment.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>*30. Decisions about approaches to treatment are made unilaterally by professionals from other disciplines.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>31. Professionals from other disciplines with whom I work encourage family members' participation in the treatment process.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>32. My colleagues from other disciplines are not committed to working together.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>33. My colleagues from other disciplines work through conflicts with me in efforts to resolve them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>34. When colleagues from different disciplines make decisions together they go through a process of examining alternatives.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>35. My interactions with colleagues from other disciplines occurs in a climate where there is freedom to be different and to disagree.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>36. Clients/patients/students participate in interdisciplinary planning that concerns them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>37. Colleagues from all professional disciplines take responsibility for developing treatment plans.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Question</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neither Agree nor Disagree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------------</td>
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<td>-------------------</td>
</tr>
<tr>
<td>38. Colleagues from all professional disciplines do not participate in implementing treatment plans.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>39. Professionals from different disciplines are straightforward when sharing information with clients/patients/students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>40. My colleagues from other disciplines and I often discuss different strategies to improve our working relationships.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>41. My colleagues from other professions and I talk about ways to involve other professionals in our work together.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>42. I work to create a positive climate in our organization.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>43. My non-social work colleagues do not attempt to create a positive climate in our organization.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>44. I am optimistic about the ability of my colleagues from other disciplines to work with me to resolve problems.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>45. I help my non-social work colleagues to address conflicts with other professionals directly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>46. My non-social work colleagues are as likely as I am to address obstacles to our successful collaboration.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>47. My colleagues from other disciplines and I talk together about our professional similarities and differences including role, competencies and stereotypes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>48. My colleagues from other professions and I do not evaluate our work together.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>49. I discuss with professionals from other disciplines the degree to which each of us should be involved in a particular case.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

*Data analysis indicates starred items may be dropped from scale.
Appendix H

Table H1

*Selected Interview Questions*

<table>
<thead>
<tr>
<th>Domain</th>
<th>Selected Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introductory Exploratory Questions</strong></td>
<td>5. What are your thoughts on interdisciplinary team work in health care?</td>
</tr>
<tr>
<td></td>
<td>6. What do you feel are the benefits of teamwork in a health care setting?</td>
</tr>
<tr>
<td></td>
<td>7. What do you feel are the risks of teamwork in a health care setting?</td>
</tr>
<tr>
<td></td>
<td>8. Would you be willing to work on an interdisciplinary team in the future? a. If yes, what do you hope to gain from this experience?</td>
</tr>
<tr>
<td></td>
<td>b. If no, what are your main concerns?</td>
</tr>
<tr>
<td><strong>Interdependence</strong></td>
<td>6. What concerns do you have about other professionals understanding your role as a health care professional in a team environment? Do you feel graduate students in different disciplines have a clear understanding of the roles you will play as future health care professionals?</td>
</tr>
<tr>
<td></td>
<td>7. How do you feel about giving feedback to other professionals in an interdisciplinary team?</td>
</tr>
<tr>
<td><strong>Newly Created Professional Activities</strong></td>
<td>4. How do you feel about the notion that interdisciplinary work improves the development of innovative new programs? Agree? Disagree?</td>
</tr>
<tr>
<td></td>
<td>5. Reflect on this statement: “Working with colleagues from other disciplines will lead to outcomes that we would not be able to achieve alone.” Do you agree? Disagree? Why?</td>
</tr>
<tr>
<td><strong>Flexibility</strong></td>
<td>6. What is your understanding of other health care discipline’s role in a team environment?</td>
</tr>
<tr>
<td></td>
<td>7. How do you feel about sacrificing a degree of autonomy to support collaborative problem solving?</td>
</tr>
<tr>
<td><strong>Collective Ownership of Goals</strong></td>
<td>5. How do you feel about colleagues form other disciplines collectively participating in patient treatment plans?</td>
</tr>
<tr>
<td></td>
<td>6. What thoughts or ideas do you have about professionals from your discipline and other disciplines’ commitment to working together as a collective unit?</td>
</tr>
<tr>
<td><strong>Reflection on the Process</strong></td>
<td>5. What are your thoughts on colleagues from other disciplines and yourself, talking together about professional similarities and differences, including role competencies and stereotypes?</td>
</tr>
<tr>
<td></td>
<td>6. How do you feel about colleagues from other health care professions evaluating your future work?</td>
</tr>
<tr>
<td><strong>Current Educational Practices</strong></td>
<td>1. Do you feel your current graduate program has prepared you for a future of interdisciplinary collaboration?</td>
</tr>
<tr>
<td></td>
<td>c. If yes:</td>
</tr>
<tr>
<td></td>
<td>i. Please describe courses/experiences your program has provided to prepare you.</td>
</tr>
<tr>
<td></td>
<td>d. If no:</td>
</tr>
<tr>
<td></td>
<td>i. What do you think is missing from your program?</td>
</tr>
<tr>
<td></td>
<td>ii. What would you like to see added to your program to prepare you, according to your current concerns?</td>
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</table>
Table H2

*Qualitative Transcription Code Sheet*

<table>
<thead>
<tr>
<th>Stated As:</th>
<th>Transcribed As:</th>
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<td>Interviewer</td>
<td>Will be expressed through the “Normal” style in MS Word</td>
</tr>
<tr>
<td>Interviewee</td>
<td><em>Will be expressed through the “Subtitle” style in MS Word</em></td>
</tr>
<tr>
<td>Interview Question Categories</td>
<td><em>Will be expressed through the “Heading 2” style in MS Word</em></td>
</tr>
<tr>
<td>Interviewer Expression of Filler Words</td>
<td>Filler words will not be transcribed for the interviewer</td>
</tr>
<tr>
<td>Interviewee Expression of Filler Words</td>
<td>Filler words will be transcribed for the interviewee</td>
</tr>
<tr>
<td>Expression, Emphasis and Emotion</td>
<td>Expression, emphasis, and emotion will be presented in (parenthesis) after the word/phrase presented with expression</td>
</tr>
<tr>
<td>Inaudible</td>
<td>If the researcher does not understand a phrase/section of transcription, it will be played three times before (<em>inaudible</em>) is stated</td>
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</table>
### Phenomenological Findings Within Domains

<table>
<thead>
<tr>
<th>Domain</th>
<th>Frame of Analysis</th>
<th>Categories</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Interdependence</td>
<td>• Lack of collaboration in graduate school</td>
<td>• Gaps in Pre-Professional Education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lack of knowledge on the educational components of other disciplines, thus lack of knowledge on professional roles</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Understanding of roles based on education</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not enough time due to heavy course load to do collaborative work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professional Application</td>
<td>• Discomfort with negative feedback</td>
<td>• Work Environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Comfort with positive feedback</td>
<td>• Role Uncertainty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Concerns with scope of practice and role boundaries</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Leadership (hierarchy) must be accepting of interdisciplinary collaboration</td>
<td></td>
</tr>
<tr>
<td>Newly Created Professional Activities</td>
<td>Education</td>
<td>• Very little to no discussion on education in regards to creativity and innovation</td>
<td>• No themes emerged</td>
</tr>
<tr>
<td></td>
<td>Professional Application</td>
<td>• Leadership must be open to interdisciplinary collaboration to promote creativity</td>
<td>• Work Environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Open mindedness of team members vital</td>
<td>• Patient-Centered Approach</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Interdisciplinary teams produce more creative and innovative solutions than individuals acting alone</td>
<td>• Personality vs. Profession</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• More perspectives produces better patient outcomes</td>
<td>• Novice vs. Professional Work Status</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Newer professionals more open to other’s ideas compared to experienced professionals</td>
<td></td>
</tr>
<tr>
<td>Domain</td>
<td>Frame of Analysis</td>
<td>Categories</td>
<td>Theme</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Education</td>
<td>• Lack of knowledge on professional roles</td>
<td>• Gaps in Pre-Professional Education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Knowledge comes from field experience rather than classroom experience</td>
<td></td>
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<td></td>
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<td>• Need for social and educational exposure to interdisciplinary collaboration</td>
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<td></td>
<td>Professional Application</td>
<td>• Hesitant to allow “role blurring”</td>
<td>• Work Environment</td>
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<td></td>
<td></td>
<td>• Working with other disciplines lessens the burden placed on professionals for patient care</td>
<td>• Patient-Centered Approach</td>
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<td></td>
<td></td>
<td>• Flexibility of professionals is a benefit to the patient</td>
<td>• Novice vs. Professional Work Status</td>
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<td></td>
<td></td>
<td>• Dictated by personality, not profession</td>
<td>• Role Uncertainty</td>
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<tr>
<td></td>
<td></td>
<td>• Newer professionals more open to sharing responsibly than experienced professionals</td>
<td>• Personality vs. Profession</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Domain</th>
<th>Frame of Analysis</th>
<th>Category</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collective Ownership of Goals</td>
<td>Education</td>
<td>• Education and training dictates ability to collectively own goals</td>
<td>• Gaps in Pre-Professional Education</td>
</tr>
<tr>
<td></td>
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<td>• Medical schools more isolated than allied professions</td>
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</tr>
<tr>
<td></td>
<td>Professional Application</td>
<td>• Commitment dictated by personality or facility, not profession</td>
<td>• Patient-Centered Approach</td>
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<tr>
<td></td>
<td></td>
<td>• Unsure of other discipline’s commitment</td>
<td>• Role Uncertainty</td>
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<td></td>
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<td>• Physicians are more unwilling to collectively own goals than allied professions</td>
<td>• Work Environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Benefits the patient to think collectively</td>
<td>• Personality vs. Profession</td>
</tr>
</tbody>
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<th>Domain</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Reflection on the Process</td>
<td>Education</td>
<td>• Exposure to interdisciplinary collaboration is lacking</td>
<td>• Gaps in Pre-Professional Education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Knowledge on others’ roles is lacking</td>
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<td></td>
<td>Professional Application</td>
<td>• Open to receive constructive feedback from others, but with caution</td>
<td>• Patient-Centered Approach</td>
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<tr>
<td></td>
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<td>• Must provide feedback if it will improve patient care</td>
<td>• Time</td>
</tr>
<tr>
<td></td>
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<td>• Time is a concern for group reflection</td>
<td>• Role Uncertainty</td>
</tr>
</tbody>
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