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## **Building Collaboration and Competence: Peer Assisted Learning and the Interprofessional Education of Allied Health Students**

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Building Collaboration and Competence: Peer Assisted Learning and  
the Interprofessional Education of Allied Health Students

Maria Tice, RN

St. Catherine University

Building Collaboration and Competence: Peer Assisted Learning  
and the Interprofessional Education of Allied Health Students

**Introduction and Purpose**

**Building Collaboration.** Clinical education of allied health students has changed dramatically, but has not kept pace with changes in health care practice and the needs of health care consumers in the United States (IOM, 2003). A summit report, *“Health Professions Education: Bridging the Quality Chasm”* (IOM, 2003) says education for health professions is in need of a major overhaul. A key concept developed during the summit and offered as an overarching vision for all programs and institutions engaged in the clinical education of health professionals is the following:

“All health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches, and informatics” (IOM, 2003, p. 45).

Interprofessional collaboration is increasingly called for as an initiative that will improve health care quality, safety, and value (D’Amour, Ferrada-Videla, & Rodriguez, et al, 2005). Interprofessional education (IPE) occurs when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes (WHO, 2010). However, much of the education of pre-licensure health professionals still takes place in “silo-ed” schools of health, where future doctors, nurses, physical, occupational, and respiratory therapists, social workers and other health providers are trained in separate classrooms.

**Barriers to Collaboration.** Barriers to collaboration are complex, impacting interprofessional cooperation at many levels. Professional, and curricular barriers to collaboration will be addressed.

**Professional barriers.** Variables associated with power, control, and authority in professions is related to demographics, such as the size of the profession, gender composition, and educational background (Irvine, Kerridge, McPhee, & Freeman, 2002). Traditionally, medicine has maintained power, control, authority and jurisdiction over predominantly female professions, such as nursing, and social work (Irvine, et al, 2002). In recent years, the growth of physician's assistant programs within institutions that previously were nursing focused has created resentments and divisions between disciplines. Nursing, as one of the largest health professions, may expect to exert more control and authority in health care than professions that are smaller.

Health practitioners are socialized to their professions through training and education that provides them with specialized knowledge, skills, and values that vary, across professions (Breitbach, et al, 2013). Professions have different understandings and interpretations of causes of illness and the appropriate treatment or approach (Irvine, et al, 2002). Where, how, and when professionals accomplish their work also varies, leading to conflict and misunderstandings in scheduling meetings, procedures, and deadlines to accomplish collaboration (Irvine, et al, 2002). To summarize, professionals often have stereotypical and inaccurate understandings and expectations of other health professions that may create conflict, rather than, collaboration.

**Curricular barriers.** Three curricular barriers will be addressed: variations in curriculum, focus on high stakes summative testing, and classrooms set up to be competitive (Ashgar, 2010; Ladyshewsky, 2006)

**Variations in curriculum.** Curricular barriers are present because varying health professions have different content requirements, accreditation standards, and budgets. Finding a way to design, implement, and evaluate interprofessional education across disciplines, budgets, and locations is challenging. There is also a lack of qualified professionals to teach IPE.

**Summative tests.** Many health professions such as medicine, nursing, and physical therapy are regulated by licensing bureaus. A major goal of Schools of Health is to prepare students to pass high stakes licensure examinations upon graduation. This approach is criticized as being inconsistent with a socio-constructivist pedagogy, and the diverse learning needs, styles, and experiences of students engaged in higher education today (Ashgar, 2010). Formative assessment, when provided as feedback that enables students to adjust their performance and improve, can motivate students to develop higher levels of self confidence, and self efficacy. Students with high self efficacy tend to do better than students with low self efficacy in reaching academic goals, perseverance, and intellectual ability (Ashgar, 2010; Bandura, 1997).

**Competitive classrooms.** Many academic and clinical allied health programs may knowingly or unknowingly set up competitive, not collaborative, classrooms through curriculum design, grading systems and admission policies (Ladyshewsky, 2006).

**Building Competence.** Health care has also changed dramatically in the past 30 years. The United States faces shortages of primary care physicians, dentists, nurses, public health professionals, and physical and occupational therapists (HRSA, 2013). Exacerbating the nurse

shortage is a critical shortage of nursing faculty to teach in nursing schools (IOM, 2003; HRSA, 2013). Medical schools also report a shortage of clinical instructors (Gifford & Fall, 2014).

Professionalism and expertise is developed through repeated opportunities for deliberate practice, feedback on performance, and reflection, similar to how athletes and artists develop talent through coaching and training (Gifford, & Fall, 2014). Developing professionals, whether they are athletes or allied health members, share common features in that they are practice based. Just reading or hearing lectures about being an athlete or nurse will not make an individual one. Similarly, for individuals to play as a team, they must practice as teams. This is the way professionals develop identity, knowledge of their roles and responsibilities, and competence.

**Barriers to Competence.** Competence is a complex, dynamic concept that includes knowledge, skills, problem solving, and clinical judgment (Verma, Paterson, & Medves, 2006). Three barriers to competence will be addressed: Student anxiety, difficulty with transfer of theory to practice, and lack of opportunities for deliberate practice and feedback.

**Student anxiety.** Development of competency is a stressful time, especially for novices in clinical learning situations (Elliot, 2002; Ladyshevsky, 2010; Lo, 2002; Timmins & Kaliszer, 2002). Students in health professions fear making mistakes that may harm patients (Ladyshevsky, 2010). A safe learning environment, caring, and mutually supportive relationships with staff and peers, and an environment where people can ask questions and admit mistakes are associated with reduced student anxiety (Kleehammer, Hart, & Keck, 1990; Massarweh, 1999).

**Transfer of theory to practice.** Applying content and skills learned in classrooms, online, or in skills laboratories, to the actual care of real patients is challenging for novices.

Patients with the same health condition may require very different levels of care, depending on the presentation of the symptoms. Individual patient differences such as personality, communication skills, or cultural differences add complexity to clinical practice (Ladyshefsky, 2010).

**Lack of practice.** Research shows that individuals develop outstanding performance and skill through years of deliberate practice and coaching, not through innate talent or skill (Ericsson, K.A., Prietula, M.J., & Cokeley, E.T., 2007). Deliberate practice means focusing on skills you can't do well or at all, in addition to those you can do. Most people are naïve about the time, effort, and motivation it takes to develop expertise. About 10 years, or 10,000 hours are needed to develop true expertise (Ericsson, et al, 2007).

Clinical faculty are hard pressed to provide the levels of observation, formative and summative feedback and evaluation needed by novice allied health students, due to critical shortages of qualified clinical teaching faculty previously addressed. In addition, providing valuable observation and formative evaluation to individual students is time consuming, especially in IPE, when interdisciplinary classes tend to be very large.

Using peers to learn with and from their peers is an innovative solution to promote deeper student learning, through more opportunities for practice of skills, while shifting greater responsibility for observation, feedback and formative evaluation to students (Ladyshefsky, 2006; Loke & Chow, 2005). Can peer teaching techniques address the twin calls to develop clinical competence and collaboration in novice allied health students?

### Questions

The project described aims to address the following questions: For interprofessional education of undergraduate, allied health students, do peer assisted learning (PAL) methods **and** more traditional methods of faculty instruction such as lecture, skill demonstration, and practice, as compared to traditional methods of faculty instruction such as lecture, skill demonstration, and practice only, result in better achievement of interprofessional core competencies? Does use of PAL as an instructional strategy show promise in overcoming barriers that threaten the development of collaborative and competent interprofessional health workers?

### Background

In the 1980's, peer coaching, also called cognitive coaching, began as a recognized technique used to prepare and support teachers in educational settings, especially at the K-12 grade level (Maskey, 2009; Zadvinskis, Glasgow, & Salsbury, 2011). Ladyshewsky (2000) explained how this model of peer coaching worked whereby pairs of practicum students, student teachers, or classroom teachers observed each other and provided feedback in correctly applying teaching skills and proposed alternative solutions to teaching needs. This approach was designed to break the negative impact working in isolation imposed on teachers. Problem solving in the complex classroom environment is eased when professionals share experiences, strategies, and ideas.

In the last decade, the concept which began as peer or cognitive coaching has also been referred to as: peer teaching and learning, peer assisted learning, collaborative learning, cooperative learning, cognitive coaching, peer mentoring, peer tutoring, peer-led teams, problem based learning, peer coaching, and reciprocal peer tutoring (Ashgar, 2010; Hughes, 2011;

Ladyshefsky, 2000; Maskey, 2009). In fact, Stone, Cooper, & Cant, (2013) conducted a systematic review of peer learning studies in Nursing conducted between 2001 and 2010 and found that the variety of terms used for PAL affected the reliability of the study. Other researchers concluded that clarification of the terms used to describe PAL is needed to guide curriculum design, implementation, and research (Stone, et al, 2013; Ladyshefsky, 2000).

### **Definitions**

**Peer Learning.** A broad definition of peer learning is a “two-way reciprocal learning activity that involves the sharing of knowledge, skills, and experiences” such that learners experience mutual benefits (Boud, 2001 p.3). Ross and Cumming (2005) describe a peer learning approach as “any situation where others learn from or with others of a similar level of background training or shared characteristics” (p.113). This definition is complementary with the definition of IPE in part, as students from two or more professions learning about, from and with each other to enable effective collaboration and improve health outcomes (WHO, 2010). The second part of the definition differs in that the learners will be from different health disciplines. Defining shared characteristics among disciplines is important in planning learning activities.

In 2000, Ladyshefsky differentiated between peer coaching and peer tutoring or mentoring. Peer coaching was defined as help and support that **equal status peers** give to each other to achieve learning objectives. The coaching may be reciprocal, or unilateral, but is not hierarchical and feedback is non-evaluative. In contrast with peer coaching, peer mentoring or tutoring, occurs when **non-equal status peers**, for example, more senior students teach and/or support junior students in learning tasks.

In more recent studies, peer coaching seems to be used interchangeably to refer to either equal or unequal status peer groups, and more emphasis is being placed on the concept of “coaching”. This is probably due to the explosion of the coaching model within health care in the last decade. Examples of using executive coaching, health coaching, and patients as peer coaches are prevalent in the current literature.

Peer assisted learning (PAL), has been used in the education of various professionals, especially in elementary and secondary education, physical education, and higher education in medicine, nursing, and physical therapy. Cooperative types of learning, such as peer assisted learning, are ideal for courses that require students to develop skills requiring manual dexterity, knowledge and clinical reasoning (Ashgar, 2010, Ladyshevsky, 2000) All peer learning involves students and other professionals (not teachers) working together to learn and improve skills through observation, evaluation, and feedback (Himes & Rivert, 2012).

**Interprofessional Competency.** Arriving at a consensus for what specific knowledge and skills are core within interprofessional education is similar to difficulties encountered in arriving at common language for the concept of peer learning methods. However, a considerable amount of consensus does exist. Conceptual frameworks addressing core competencies for interprofessional collaboration (IPC) were reviewed. These frameworks took different approaches to arrive at core competencies. One approach analyzed professional standards to extract common competencies across professions (Verma, et al, 2006; Verma, et al, 2009). A second approach identified common competencies through IPE literature review to identify core competencies for interprofessional collaboration

**Frameworks based on professional standards.** One framework for interprofessional core competencies developed by Verma, Paterson, & Medves, (2006) applied to allied health

professional competencies identified in two different studies. In the first study, a model based on the CanMEDS competency framework developed by the Royal College of Physicians and Surgeons of Canada in 2001, and updated in 2005, was applied to the professions of medicine, occupational therapy, nursing, and physical therapy to determine common competencies for learners in health care. Professional codes or standards for practice for each profession were analyzed and placed into the following “units of competency”, as identified in Can MEDS, for comparison: professional, expert, scholar, manager, communicator, and collaborator. The study found that all these regulated professions had standards pertaining to the identified units of competency which could be utilized as common areas to develop in planning learning objectives, expectations and standards across professions.

The second study looked at regulated and unregulated professions of medical technology, social work, pharmacy and psychology using the same methods described in the previous study. Again, this study found that all these professions had common competencies related to being a professional, expert, scholar, manager, communicator and collaborator (Verma, et al, 2009). This model is useful to educators because professional standards guide the accreditation process and the development of curriculum.

The Essentials of Baccalaureate Education for Professional Nursing Practice (American Association of Colleges of Nursing, 2008) was also included, as these standards were used to develop curriculum for two of the studies reviewed (Kurtz, Lemly, & Alverson, 2010; Zentz, Kurtz, & Alverson, 2014). Bachelor of Science in Nursing (BSN) programs in the United States use the essential roles described in this standard to develop learning objectives and outcomes. The essential roles are: teacher, manager, lifelong learner, research consumer, and provider of care. There is considerable overlap with the model developed by Verma, et al (2006). The role of

Manager was identified in both works. Scholar could be interpreted as a consumer of research.

Professional and Expert are public expectations for health clinicians as Providers of Care.

Teacher overlaps with scholar, but was included as a separate core competency, due to society's need to promote the development of academic and clinical teaching faculty.

**Evidence based frameworks.** Bainbridge, Nasmith, & Orchard, et al (2010) describe an emerging model for Canadian Interprofessional Collaboration (IPC) that considered previous descriptions of IP core competencies with more current descriptions in the literature. After literature review, a model consisting of six domains, and three key background themes was created. The six domains are: role clarification, patient/client/family/community-centered collaboration, team functioning, collaborative leadership, interprofessional communication, and dealing with interprofessional conflict. The six domains are essential characteristics in every interprofessional experience.

In contrast, the three key background descriptors are fluid. These change depending on the level of the learner or clinician, and on the context of practice. Underpinning the six domains are these three fluid concepts: the context of practice, the complexity of the situation, and the overarching principle of quality improvement. These factors will influence the type and nature of interprofessional collaboration..

In the United States, the Core Competencies for Interprofessional Education Collaborative Practice (IPEC, 2010) are used to guide curriculum design and learning objectives in programs at many federally identified centers for interprofessional practice. In this model, there are four broad competency domains: values/ethics, roles/responsibilities, interprofessional

communication, and teams and teamwork. Sub-headings under each domain define the broad competencies in more detail.

From these four models, two tables identifying common core competencies for interprofessional practice was created. Each of the 11 studies selected was analyzed to find out if key words associated with any of the IP core competencies were addressed. (See Tables 2 and 3).

### **Theoretical Foundations of Peer Assisted Learning**

**Cooperative Learning.** One of the major theoretical foundations for all types of peer teaching and learning is Cooperative Learning (CL). Perspectives that have guided the research and development of CL are social interaction, cognitive developmental, and behavioral learning theories.

**Social Interaction Theories.** Social interaction theories believe that the way social interactions are structured effects the way people interact. The way people interact determines outcomes. When positive interdependence, i.e. cooperation, is present in environments, members will encourage each other, making learning easier and more rewarding. (Johnson , Johnson, & Smith, 1998).

**Cognitive Developmental Theories.** Cognitive developmental approaches from Piaget, Vygotsky, Kohlberg, Murray, and Johnsons, and Tjosvold contribute to CL. Vygotsky's theory of proximal development was mentioned in many of the studies as explaining why peer learning is so effective. Vygotsky says that social and cognitive interaction with a more capable peer allows the less capable peer to develop new areas of potential (Ladyshefsky, 2010). Piaget's theories of development remind faculty that learning new skills is a developmental process, and skills need to presented accordingly form simple to complex. Advocates of the Piagetian

perspective believe group interactions can create cognitive conflict and disequilibrium that lead an individual to question his or her understanding and try out new ideas (Slavin, 2000; Woolfolk,2001).

**Behavioral Learning Theories.** The third strand of theory in CL is behavioral learning theory which says that actions followed by extrinsic rewards for group members will be repeated. Skinner, Bandura, Homans, Thibaut, & Kelley, and Mesch-Low-Nevin are prominent contributing theorists. “Behavioral learning theory assumes that students will work hard on those tasks for which they secure a reward of some sort and will fail to work on tasks that yield no reward or yield punishment. Cooperative learning is designed to provide incentives for the members of a group to participate in the group's effort” (Johnson, Johnson, & Smith, p. 4).

**Background of CL.** Cooperative learning began being used in K-12 education in the United States in the 1980s. Cooperative learning is an evidence based teaching strategy that promotes socialization and active learning across diverse subject areas (Ladyshefsky, 2000). Johnson, Johnson, and Holubec (1998) reviewed over 500 studies on cooperative learning and found evidence for higher learning achievement outcomes in cooperative learning versus competitive or individualistic approaches. Other benefits cited were increased motivation to learn, a more positive attitude towards learning and higher self-esteem. “Cooperative learning is a good strategy for increasing educational outcomes and is particularly useful for developing competencies in verbal and spatial problem solving and motor performance” (Ladyshefsky, 2000, p.15).

**Definitions and Essential Elements.** Cooperative learning is further defined as the instructional use of small groups of students, working together for optimal learning of the individual and group members. Group work is structured, systematic, and directed towards a

common goal (Johnson, Johnson, & Holubec, 1998). Common goals are communicated to the group members, rewards are given for group achievement, individual roles are assigned to each group member, and tools are provided that develop social skills for effective group work (Alexander, Lindow, & Schock, 2009). There are five essential elements that must be in place for cooperative learning. According to the Johnson and Johnson Model (1999) these are: positive interdependence, individual accountability, face to face interaction, group processing, and development of small group interpersonal skills.

**Cooperative Learning and Interprofessional Learning.** D'Eon (2004) identified cooperative learning and experiential learning as two models that should be part of the “blueprint” teachers use to design engaging, meaningful learning using active learning and team work in interprofessional learning. These models also provide guidance in how faculty can structure increasingly complex tasks within IPE, from simple to complex, to allow deep learning and foster transfer of knowledge and skills to novel and complex situations.

Clark (2006) also suggested cooperative, collaborative or social learning, as one of five different theoretical approaches to guide IPE. Clark said that it is not surprising that theory pertaining to cooperative, collaborative, or social learning would be relevant to IPE given that the definition of IPE is at least two or more professions learning “with, from, and about” each other (WHO,2010 ). Clark and others advocate the use of problem- or case- based studies as the instructional approaches within which students learn collaboratively to solve complex problems (Barr, Koppel, & Reeves, et al., 2005; D'Eon, 2005; Harden, 1998; Owens, Padula, & Hume, 2002; Pirrie, Wilson, & Harden, et al, 1998).

Cooperative learning has been combined with other pedagogies to create robust IPE curriculum models. For example, the New Generation Undergraduate model devised by the

University of South Hampton, UK, in 1999, combines guided discovery learning, cooperative learning, and interprofessional learning in a model called the facilitated collaborative interprofessional learning model (O'Halloran, Hean, & Humphris, 2006).

In this paper, the concept of peers learning from peers, referred to PAL, will include peer learning that occurs between both equal and unequal status peers, as well as peer learning that is reciprocal, unilateral, within disciplines, and grade levels, and across disciplines and age levels.

### **Literature Review**

Literature review was undertaken using the PICO algorithm of Population, Intervention, Comparison, and Outcome. For this study, the following terms were used:

Population : undergraduate allied health students in interprofessional education

Intervention: cooperative peer assisted learning and traditional faculty instruction including lecture, skills demonstration and practice.

Comparison: traditional faculty instruction including lecture, skills demonstration and practice only.

Outcome: greater ability in one or more IP competency area

CINAHL, Medline, and EBESCO, ERIC and Cochrane databases were searched using the keywords: education, allied health; undergraduate students; interprofessional relations; peer learning; cooperative learning; core competencies and various combinations of the keywords. Inclusion criteria were English language, peer reviewed scholarly articles, from 2009 to 2014, health-related. Exclusion criteria were non-student peer coaching/learning, executive coaching, wellness or life coaching, doulas, peer coaching in elementary through secondary classrooms,

non- allied health students, and medical students. Snowballing was also used. 30 articles meeting these inclusion-exclusion criteria were identified. These articles were hand searched to select those that addressed the development of skills or competencies in health education. 11 studies were selected for inclusion in this project.

An attempt was made to identify studies from a wide range of allied health fields, as one of the aims of this study is to identify IPE instructional approaches, applicable across all allied health disciplines. Both quantitative and qualitative studies were chosen. The 11 articles are summarized in Table 1, according to author, research and theoretical design, participants and setting, research question and results.

### **Characteristics of Literature Reviewed**

**Level of evidence.** Peer assisted learning approaches have been studied through a variety of research designs, mostly mixed methods, qualitative and quantitative studies. No randomized controlled trials (RCTs) were found in the literature review. (See Table 1).

**Participants.** The participants in these studies were selected to be undergraduate allied health students, ideally, allied health students engaged in interprofessional models of peer assisted learning, where “two or more professions learn with, from, and about” each other (WHO, 2010). Of the studies reviewed, six studies pertained to nursing students, two studies of physical therapy students, 1 study to anatomy and physiology science students. Three studies involved truly interprofessional education, where IPE is defined as “two or more disciplines working to learn with, about and together”. First, the study of Fogstad, Christiansen, & Polit (2011) involving second year physiotherapy students and first year nursing students learning together in the skills laboratory. Second is the work of McLelland, et al, (2013) which studied the outcome of peer

learning when undergraduate midwifery students taught content to paramedic students. Third, is a study of three different educational levels of nursing students, working with social workers and counselors in a community agency (Sims-Giddens, et al, 2010).

**Settings.** Cooperative peer assisted learning was used in different settings for different learning purposes. Most of the settings were clinical skills and simulation laboratories (n=6), designed to develop clinical skills and integrate skills with classroom content for deeper understanding. (Ashgar, 2013; Branagan, et al, 2013; Himes & Ravert, 2012; Kurtz, et al, 2010; Zentz, et al, 2014). This is consistent with previous studies. One setting was a supplemental study class, led by peer teachers, designed to help students failing an anatomy & physiology class (Hughes, 2010). In addition to content and lab skills review, peer learning was used to help students develop time management and study skills (Hughes, 2011). Peinhardt & Hagler (2013) used peer learning to develop better evidence based writing skills through peer review and feedback. Peer learning was also used to deliver health care to high risk populations in a community non-profit agency (Sims-Giddens, et al, 2010).

### **Findings and Discussion**

**Question One.** For interprofessional education of undergraduate, allied health students, do peer assisted learning (PAL) methods **in addition** to more traditional methods of faculty instruction such as lecture, skill demonstration, and practice, result in better achievement of interprofessional core competencies? In this review, peer learning strategies appeared well suited to the development of interprofessional competencies. Collaborative leadership, communication, and knowledge of professional and interprofessional roles and responsibilities, were the core competencies identified most often as learning outcomes in the studies reviewed

(See Tables Two & Three). PAL is also ideal for developing professional roles and responsibilities of teacher and coach (Ashgar, 2010; Kurtz, et al, 2013; McLelland, et al, 2013). Patient-centered care and ethics/values, as competencies, were not addressed in these studies. These competency outcomes may have occurred, but key words, specifically referring to these outcomes were not identified in the articles. None of the studies measured changes in any of the interprofessional competencies directly. Some the studies were designed to explore how students perceive a peer learning approach (Ashgar, 2013; Fogstad, et al, 2011). Himes & Ravert (2012) asked if the use of situated peer coaching and unfolding cases in a skills lab resulted in higher student ratings of the class, and higher student self-evaluations.

Of all the studies reviewed, Kurtz, et al, (2010), and Zentz, et al, (2014) posed questions most closely related to achieving interprofessional competency. Kurtz, et al, asked if nontraditional strategies such as peer teaching and laboratory simulation achieved clinical competency of nursing students? Findings indicated that students reported increased self-evaluated levels of confidence, self-direction, and competence as an outcome of peer learning.

Zentz, et al, (2014) asked if the experience of peer learning aided students to implement roles of a professional nurse as care provider, teacher, manager, and research consumer. Findings showed that a major benefit for senior students in the tutor role is reflection on their professional role, which strengthened confidence and transition to the role of professional nurse.

**Question Two.** The second question, does use of PAL as an instructional strategy show promise in overcoming barriers that threaten the development of collaborative and competent interprofessional health workers, will be discussed.

**Professional buffers.** Professional barriers threatening collaboration were related to traditional hierarchies of power, control, and authority, a lack of understanding of the roles, responsibilities and work habits of different professionals, and miscommunication due to training in silos and the different meanings professionals attach to treatment approaches. McLelland, et al, (2013), found both educational and professional gains for undergraduate students from two different disciplines having shared peer learning experiences, including a better understanding of each other's roles. Fogstad, et al, (2011), found positive benefits on collaboration for social enhancement, reflection, dialogue, problem-solving and development of clinical skills and professional identity.

**Curricular buffers.** Curricular barriers were identified as varying interdisciplinary curriculum requirements with shortages of qualified IPE teachers, a focus on summative assessment, and classrooms that are set up to be competitive. In this area, several studies offered promising buffers to address curricular barriers. Using students with expertise in one discipline to teach students skills is a creative way, cost-effective way to enrich the curriculum, and bring interdisciplinary faculty members into collaborative efforts. McLelland, et al, (2013), found that when final year midwife students developed workshops for second year paramedic students focused on care required during and after the birth of a baby, results indicated both educational and professional gains, including a better understanding of each other's roles & responsibilities.

When used as a formative evaluation process whereby students can see where gaps in knowledge, or mistakes occur, and make adjustments, PAL sets up collaborative, rather than competitive learning environments (Ashgar, 2013; Ladyshevsky, 2010; Himes & Ravert, 2012) . Many students feel freer to experiment with skills, ask questions and admit what they don't know when working with peers, rather than faculty (Fogstad, et al 2011). In all the studies, student

response to peer learning as being worthwhile and enjoyable was largely positive, which could go far to reinforce team learning environments was being rewarding.

Students involved in PAL also engage in both formal and informal learning (McKenna, & French, 2011; McLelland, et al, 2013). Informal learning such as tips to make tasks easier, information about instructor styles, and time management, contributes to students learning, and feeling supported (McKenna & French, 2013). This informal learning most likely creates a learning environment that allows interdisciplinary mutual support which also reinforces the benefits of interprofessional collaboration.

Ashgar (2010) described an innovative, time saving approach for faculty involving assessment of student clinical skills. In this study, after faculty preparation through lecture and demonstration of skills, each student wrote a competency log, describing how to perform eight skills. Then, groups of six students practiced skills together. At assessment time, faculty would randomly select one member of the group to demonstrate the skill. If the student passed, all group members passed and were signed off on their individual competency logs. This study showed how the group goal and rewards were designed to promote collaboration and cooperation, rather than competition.

**Buffers for student anxiety.** Student anxiety, lack of confidence, and self-efficacy were reported to be barriers in competency development. In the limited number of studies in this review, imbedding peer learning opportunities were reported to develop confidence and reflective practice, reduced anxiety, self-efficacy and self-regulation (Ashgar, 2013; McKenna & French, 2011; Kurt, et al, 2010; Zentz, et al, 2014). Most of the studies found that mentoring of

lower level students by senior students report decreased anxiety, but in one study, students being tutored resulted in increased anxiety (Branagan, et al, 2013).

Some students also expressed anxiety about teaching others, and felt a sense of responsibility that they might teach them incorrectly or not know how to handle situations. This anxiety usually dissipated as they learned about learning theories and strategies, and gained experience (McKenna & French, 2011). Many of these feelings are normal for novice learners. However, this concern is valid, and is a reason why faculty needs to understand more about all the variables that effect successful PAL.

**Buffers to lack of deliberate practice.** PAL helps novice health students learn to transfer the skills and content learned in school to actual clinical practice through opportunities in a safe environment to be observed and to observe others; get and give feedback; and evaluate the performances of themselves and other (Ashgar, 2013; Fogstad, et al, 2011; Himes & Ravert, 2012; Ladyshevsky, 2010; Sims-Giddens, et al, 2010).

Peer learning has helped failing students achieve increased final grades, but positive effects are correlated with increased attendance at remedial sessions, which supports the concept that deliberate practice is needed to develop competence (Hughes, 2011). The development of expertise in any field takes years of hard work and dedication, however, mastery can occur more quickly through cooperative peer learning (Ericsson, et al , 2007, Ladyshevsky, 2010).

PAL has also been suggested as a cost effective way to extend the reach of limited numbers of health faculty available to work with large groups of students, while still resulting in positive learning outcomes, and safe and competent practitioners (Branagan, et al, 2013, Dennison, 2010). Several studies found that the tutor experiences of peer teaching lead some

participants to express interest in teaching careers within their profession (Hughes, 2011; Zentz, Kurtz, & Alverson, 2014).

### **Challenges**

Using cooperative forms of peer learning in classrooms requires substantial investments of faculty time to design and support the experiences, especially initially (Sims-Giddens, et al, 2010). Skilled educator design of peer learning processes is key in using PAL effectively (Ashgar, 2010). Preparation of students and faculty for PAL is often lacking and effects achievement. Students reported that being inadequately prepared for peer learning activities is frustrating (Himes& Ravert, 2012). Challenges discussed further include faculty development, preparation for PAL, securing resources, and giving feedback. The emotional aspects of group work can also be challenging for students and faculty.

**Faculty development.** Faculty preparation is much more complex when designing IPE. Institutions must be committed to IPE in order to plan for meetings, curriculum design, and evaluation of interprofessional competencies across disciplines. Faculty development in cooperative learning theories and other concepts related to group work is needed (Ladyshefsky, 2000). Schools of allied health can select one of many theoretical frameworks that incorporate cooperative peer learning available as a guide for curriculum design, implementation and evaluation (Clark, 2006; D'Amour, et al, 2005; D'Eon, 2004; IPEC, 2011; O'Halloran, et al, 2006; Sargeant, 2009). Designing learning objectives to meet interprofessional core competencies gives cohesion to IPE and ensures that peer learning experiences are meaningful and connected to competency outcomes (Bainbridge, et al, 2010; Verma,et al, 2006; Verma, et al; 2009, Schroder, 2009; Wood, Flavell, & Vanstolk, et al, 2009).

**Preparation for PAL.** In all eleven studies, preparation of students was preceded by faculty instruction in content and demonstration of skills required before novice students launched off on their own. Content related to foundational skills for communication, conflict resolution, and developing observational and coaching skills also needs to be threaded throughout the learning experience. Students must also take responsibility to complete preparatory assignments such as: attending lectures, completing reading assignments, or viewing a skills video, prior to PAL experiences.

**Giving effective feedback.** Providing feedback, identified as a critical determinant in the effectiveness of PAL, was reported to be a challenging area for some of the participants (Hughes, 2013; Ashgar, 2010). Some students reported anxiety about giving others feedback and about receiving feedback from others. Others reported not wanting to hurt others' feelings, or seem rude, or insensitive, (Ashgar, 2010). Students reported valuing feedback from an instructor more than feedback from a senior level tutor, and feedback from a senior level peer, more than from a same age peer, showing that hierarchical structures are difficult to overcome (Ashgar, 2010; Branagan, et al, 2013). However, in a study where nursing students provided peer review and feedback on draft research papers of undergraduate classmates, participant mean scores between draft and final papers improved dramatically (Peinhardt & Hagler, 2013).

**Developing resources for student success.** Providing resources and structured forms of communication is another way faculty can guide students' learning, and save professional contact time. For example, in a class where students are expected to analyze and give feedback on peers' writing of a research paper, they are given a detailed peer coaching tool, available on the web for review, prior to the face-to-face class setting. The tool gave extensive open-ended questions and prompts related to the essential areas in a well written research paper (Peinhardt &

Hagler, 2013). Resources such as instructional manuals, DVDs, checklists, and structured peer review guides were some of the methods faculty used to structure peer learning, both initially, and as experiences evolved. Developing resources can also be part of the learning projects students work on in their groups (Sims-Giddens, et al, 2010).

A valuable outcome of using PAL is student opportunities to practice and improve teaching skills.(McKenna & French,2011; McLelland, et al, 2013). This outcome will improve patient care and may alleviate shortages of academic and clinical faculty in higher education. However, many allied health faculty report feeling ill prepared for the task of revising curriculum and setting up successful structures to implement PAL, and IPE, both in terms of time and knowledge. If programs have allied health educators that specialize in health teaching, such as Nurse Educator tracks, partnering the skills and learning goals of faculty and students to engage in peer work might produce valuable interprofessional learning products.

**Student emotions and motivation.** The emotional aspects of novice students also need to be considered (Ashgar, 2010). For example, group work can exert positive emotional pressure on students that motivates them to get preparatory assignments done, so they don't let their peers down, but it can also have negative impacts. How a student sees themselves, in relation to being able to achieve their goals, influences whether positive or negative emotions emerge, and whether motivation and confidence is increased or diminished (Ashgar, 2010).

Peer assisted learning has much to offer in designing interprofessional learning that result in interprofessional competency outcomes. Universities can create opportunities for IPE by building on the many examples of uniprofessional peer learning cited here. Faculty should also model an interprofessional approach by being open to team teaching, where at least two or more

faculty from different allied health professions design curriculum, and are present in the classroom together, in a face to face setting; or respond within discussion boards online, to create a truly diverse and stimulating environment for IPE.

### **Future Implications**

Much remains unexplored in applying PAL to IPE. While interprofessional education and cooperative peer learning are both contemporary approaches in health education, there is little evidence of them being used together (Fogstad, 2011;McClelland, et al, 2013). In the past 10 years, many studies of peer learning in uniprofessional settings have been conducted. Three studies exploring the use of PAL in interprofessional learning were identified in this literature review. More research on using peer learning in IPE is needed, especially randomized controlled trials. In addition, other dependent variables, such as the amount of time students practice with peers or, the structure of groups in terms of number of members, and characteristics of the groups in regards in gender, age, discipline makeup, or how particular core competencies are met within peer learning groups could be studied.

Zentz, et al (2014) recommended further studies regarding issues of diversity and learning styles, as well as, faculty perception of the effectiveness of PAL in achieving learning outcomes. Larger sample sizes at multiple sites were also recommended (Zentz, et al, 2014). Sims-Giddens, et al (2010) encouraged researching the value of peer learning in agencies, and their usefulness in clinical research opportunities. A longitudinal study of the effects of peer learning on nurses' career paths was also advocated. Future studies could explore how patient-centered care and values/ethics can be taught within interprofessional peer learning groups.

### **Conclusions**

PAL is a flexible, adaptable, and useful learning strategy that is well suited to promoting active learning. Peer learning groups can be set up with same level students, across same discipline grade levels, and across grade levels and across allied health programs. PAL was mostly used to improve clinical skill development and application to practice but was also used to improve writing and teaching skills, and assisted struggling students to pass science classes. PAL was also used to allow health care to be delivered to at risk populations in a community agency.

PAL does not guarantee positive learning outcomes. Educators must be knowledgeable and skillful in setting up peer learning. Using peer assisted learning as an instructional strategy can provide support for students to learn how to navigate an increasingly complex and changing health care system. Collaborative reliance on our peers provides increased opportunities for practice, with observation, feedback and support. Students are freer to admit what they don't understand, and ask questions, providing a safe environment for innovation and quality, while making complex work more enjoyable and rewarding.

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Table 1

*Literature Review*

| Author   | Theoretical Model/Research Design   | Participants and Setting  | Instructional Method  | Research Question   | Results/Conclusions   |
|--|---|---|---|---|---|
| Asghar (2013)  | Cooperative learning<br><br>Phenomenological methods  | Undergraduate physiotherapy students in the UK, skills laboratory.  | Reflective skills log-students record their competence in the practical skills taught in the university setting. Students also write about each skill, which serves as a resource for clinical.           | How do first year physiotherapy students perceive the reciprocal peer coaching process?   | Three themes identified:<br>Motivates learning<br><br>Reciprocal peer learning serves as a formative assessment which promotes student self-regulation.   |
| Branigan, Dellinger, Thomas, Mitchell, Lewis-Trabeaux, Dupre (2013). | Social cognitive theory (Bandura).<br>Toppings definitions of peer tutoring.<br><br>Mixed method<br>Quantitative intervention design and qualitative survey | 1 <sup>st</sup> year (N=179)and 3 <sup>rd</sup> year (N= 51) baccalaureate nursing students in psychomotor skills learning lab<br><br>South Central university in USA | Faculty led presentation of theory and post-op wound care followed by 90 minutes of skills practice supervised by lab faculty only (control group) versus lab faculty and peer tutors(intervention group) | Do students who engage in peer tutoring in addition to faculty instruction show differences in self-efficacy and cognitive gains in laboratory skills as compared to students receiving faculty instruction only? | Contrary to previous studies, use of peer tutors did not decrease anxiety for 1 <sup>st</sup> year nursing students. No differences between intervention and control groups for self-efficacy and cognitive gains were seen.<br><br>Findings may indicate need to better prepare peer tutors.<br><br>Research should be |

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|                                      |   |   |   |  | conducted using more complex skills.  |
| Fogstad, Christiansen, Polit (2011). | <p>Socio-cultural theories with peer learning and tutoring as pedagogical tools.</p> <p>Mixed methods quantitative and qualitative, cross sectional survey and questionnaire. Convenience sampling.</p> | <p>Second year physiotherapy students (n=106) and first year nursing students (n=884), skills laboratory.</p> <p>Oslo University College, Norway.</p> | <p>Cooperative project based on interdisciplinary and cross-level learning in patient transfer activities.</p> <p>One week of teacher lecture and demo to prepare PT students followed by 1 day where second year PT students tutored 1<sup>st</sup> year nursing students how to transfer patients safely, using the patients' own resources, with only one faculty present in the lab. Nursing students also received 1 day of lecture, content from staff to prepare them for experience</p> | <p>Do nursing and physiotherapy students view peer learning as an innovative strategy?</p> | <p>Nursing students had a significantly higher score for theoretical knowledge and practical skills, both groups agreed learning safe patient transfer with and from each other was advantageous. PT tutors scored lower on the request for more future peer learning. Both groups considered peer learning advantageous.</p> <p>PT students were challenged by nursing students, leading to PT students need to develop new scenarios relevant to patient care in practice.</p> <p>Positive benefits or collaboration for social enhancement, dialogue, reflection, problem solving, and development of clinical skills.</p> |

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|                       |  |   |  |   | Development of professional identity   |
| Himes & Ravert (2012) | Principles of situated cognition and situated coaching (Benner, et al, 2010)   | Novice nursing students in Fundamentals Skills Laboratory<br><br>Brigham Young University, USA  | In fundamental skills laboratory, Instructors provide initial demonstration and direction about a skill. then, pairs of students work through a detailed script to advance a scenario through role play.   | Does use of situated peer coaching and unfolding cases in a fundamental skills lab effect student ratings and student performance self-evaluations? | Both student evaluations of the course and self – evaluations were high. In addition to performing psychomotor skills, students focused on safety issues, practiced collaborative communication, and critical thinking.  |
| Hughes, K.S. (2011)   | Mixed method Quasi-experimental design with student pre- and post-intervention, GPA, and evaluation data, , peer assistant interview and questionnaire | Supplemental instruction for repeat or failing undergraduate science students in Anatomy & Physiology I class and lab content at Columbus State University, GA, USA | Implemented a cross-year, peer assisted supplemental tutoring program led by 2 previous students to assist students failing Anatomy & Physiology class and assist with study habits, time management, inability to process and organize information. | Could supplemental sessions led by peer leaders improve learning outcomes for struggling students?  | Students who attended at least 6 sessions had higher final course averages and greater improvements in pre- and post test scores.<br><br>Scheduling sessions to meet student schedule needs is challenging and impacts attendance. Make sessions mandatory?<br><br>Positive response of students.<br><br>Unexpected finding was effect on peer |

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|                                   |   |   |  |   | leaders. Several changed career paths to teaching science tracks.  |
| Kurtz, Lemley, & Alverson (2010). | Likert survey   | Fundamentals Nursing Skills Course , 2 <sup>nd</sup> semester sophomore baccalaureate Nursing students. Includes practice in simulation lab.<br><br>Valparaiso University, Indiana, USA           | Designed a teaching strategy, The Master Student Presenter, whereby students teach a peer a fundamental skill in the simulation lab setting.<br>Objectives included: synthesis of current literature to establish EBP, oral presentation delivery to peers, skill demonstration to peers, presenter evaluation of peers' skill demonstration | Do nontraditional strategies, such as peer teaching and laboratory simulation, achieve clinical competence of nursing students? | Students learned material in a way that increased confidence, self-direction, and competence in roles as teacher, manager, lifelong learner, research consumer, and care provider.<br><br>Research was reported to be most difficult area for students.<br><br>Students value interaction with faculty as prep for assignment. |
| McKenna, L. & French, J. (2011)   | Mixed methods. The Clinical Teaching Preference Questionnaire (CTPQ) was used to evaluate peer teaching and learning experience. Focus group. | Third year(n = 105) and first year nursing (n = 112) students in a class developed to integrate knowledge and skills with teaching and learning in practice.<br><br>Monash University, Australia. | As part of an assessment of the unit, third year students are required to teach lab-based skills to first year students, under faculty supervision. Developing teaching plans, learning objectives, and effective teaching and learning processes  | Is a peer teaching/learning strategy effective for preparing students as educators in practice?                                 | Imbedding peer teaching opportunities offers peer teachers to develop confidence and reflective practice, for peer learners, this approach reduced anxiety and enhanced practice opportunities.<br><br>Informal, unplanned learning occurred.  |

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|  |  |   | was part of requirement.  |   |   |
| McLelland, McKenna, and French (2013). | Mixed methods. Questionnaire & focus groups  | Undergraduate midwifery students and undergraduate paramedic students.<br><br>Monash University, Australia  | As part of a final year education unit, final year midwifery students developed workshops for second year paramedic students focused on care required during and after birth of a baby            | Is cross discipline PAL of midwife students to paramedic students effective?  | The study indicates both educational and professional gains for undergraduate students from two different health disciplines having shared peer learning experiences, including a better understanding of each other's roles. |
| Peinhardt, R.D. & Hagler, D. (2013)    | Mixed methods. Masked and nonmasked faculty rater (with interrater reliability of > 0.99) scoring of drafts and final papers.  | RN-to-BSN students in a large university in the US. Seniors in a complex care course, hybrid format.  | Students brought drafts of their evidence based research paper for peer review. Peers provided evaluation feedback by using a coaching tool.  | Can use of peer coaching to provide scaffolded peer review and constructive feedback improve the quality of written research papers of undergraduate nursing students between draft and final copy? | Drafts and final papers were scored. The mean scores of the participants papers improved dramatically after peer feedback.  |
| Sims-Giddens, Helton, & Hope (2010).   | Benner's framework of novice to expert.<br><br>Mixed methods. Investigator developed mentoring-evaluation tool for pre- and post test; qualitative interviews with participating students. | Community agency partnership between a school of nursing and non-profit, grant funded, community based agency serving at risk families with children from prenatal period to age 5 years, using a graduate nurse educator student to mentor RN-to-BSN | Working within budget constraints, the leadership students developed 2 manuals and an orientation video to be used by future nursing students at the agency.<br><br>The community health students | Can student-to-student peer mentoring be used to deliver health care to at-risk populations in a community-based setting?   | Program has grown, expanded to include more students and agencies.<br><br>Students identified they could accomplish more collectively than as individuals.<br><br>Student selection criteria: personality                     |

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|   |                             | <p>students, 2 involved in a leadership capstone project designed and implemented organizational policies and procedures for the agency, 2 RN-to-BSN community health performed a community assessment of the at-risk population and their health care needs.</p> | <p>created forms to document assessments, visits, medications, goal assessment, and education. Forms were developed, field tested, evaluated and refined.</p> <p>All students kept journals, reflecting on experience.</p> |   | <p>fit, ability to work within group, ability to work in non-structured settings, motivation to create and implement innovative products.</p> <p>Preparation of students is key.</p>                               |
| <p>Zentz, Kurtz, &amp; Alverson (2014).</p> | <p>Mixed methods Survey</p> | <p>Senior students in virtual lab and clinical setting as peer mentors of sophomore students</p>  | <p>Undergraduate Nursing senior and sophomore students: Valparaiso University, IN, USA</p>   | <p>How effective is peer assisted learning in the clinical setting?</p> <p>Does this experience aid students to implement the role of professional nurse as care provider, teacher, manager, and research consumer?</p> | <p>A major benefit for seniors was reflection on their professional role, which strengthened confidence and transition to the role of professional nurse. A major benefit for sophomores were reduced anxiety.</p> |



