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Interprofessional education activities and new practitioner competence: Implications for practice in nutrition and dietetics education

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Interprofessional education activities and new practitioner competence:
Implications for practice in nutrition and dietetics education.

by

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DISSERTATION

Presented to the Brooks College of Health in partial fulfillment of
the requirements for the degree of Doctorate in Clinical Nutrition

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“I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.”

Excerpt from The Road Not Taken
Poem by Robert Frost

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Abstract

Interprofessional education (IPE) and interprofessional collaborative practice (IPCP) are associated with improved perception, values, attitudes towards collaborative practice, and therefore benefits patients, practitioners, and health care systems. Notable organizations have long promoted standardized guidelines for best practices in interdisciplinary team-based learning to improve patient safety and health outcomes. The state of IPE in nutrition and dietetics practice was recently addressed by the Nutrition and Dietetic Educators and Preceptors (NDEP) practice group of the Academy of Nutrition and Dietetics. The authors generated a call to action to engage in IPCP while pushing the boundaries of leadership in teaching, research, and practice. Present understanding of IPE demonstrates the need for further research particularly focused on the relationship between the types of IPE activities and the outcomes of self-confidence and competence surrounding IPCP achieved by new RDN practitioners. Unique in its approach, this study deployed mixed methods research to ascertain current IPE practices within nutrition and dietetics programs. RDN practitioners within the first few years of independent practice were surveyed to collect data on program type, IPE activities, and reactions to these learning experiences. This information was then analyzed to determine significant findings and indications for the second phase of focus groups comprised of current program directors. The qualitative portion provided detailed information such as thematic elements, IPE activities within programs and recommendations. Information gathered helped to identify opportunities to improve the IPE practices in the education and training of future nutrition and dietetics professionals.

Introduction

Interprofessional education (IPE) and interprofessional collaborative practice (IPCP) are associated with improved perception, values, attitudes towards collaborative practice, and therefore benefit patients, practitioners, and health care systems.¹⁻³ Notable organizations⁴⁻⁷ have long promoted standardized guidelines for best practices in interdisciplinary team-based learning to improve patient safety and health outcomes. However, there remains substantial difficulty in the implementation of interprofessional development activities in education and practice because of many factors such as lack of formal assessment or quality of evaluation tools, gaps related to theory and context, cultural influences, and feelings of intimidation.⁸⁻¹⁰ The situation is further complicated by considerable variation in the types of IPE activities and the assessment of learners' IPE knowledge, skills, and attitudes.^{1,11-13} This perplexity creates the basis on which to consider the future implications of practice for educators within the health professions. There is ample opportunity to explore best-practice models and learn from others in promoting shared learning that motivates and sustains meaningful change.

The state of IPE in nutrition and dietetics practice was recently addressed by the Nutrition and Dietetic Educators and Preceptors (NDEP) practice group of the Academy of Nutrition and Dietetics.¹⁴ The authors generated a call to “action for us all, as students, educators, clinicians, and researchers, to take up the mantle and lead the efforts in our learning and workplaces to engage in IPCP while pushing the boundaries of leadership in teaching, research, and practice.”¹⁴ Specifically, preparation of nutrition and dietetics students to meet entry-level competencies related to interprofessional practice for the Registered Dietitian Nutritionists (RDNs) is addressed in the current version of program accreditation standards.^{15,16} The Academy of Nutrition and Dietetics¹⁷ incorporated an emphasis on IPCP within its mission, vision, and principles. Further, this theme carries forth to the Standards for Professional Performance for Registered Dietitian Nutritionists (Competent, Proficient, and

Expert) in Education of Nutrition and Dietetics Practitioners,¹⁸ where practitioners continue to promote IPCP knowledge, skills, and attitudes throughout professional development activities as a commitment to continuing competency and lifelong learning.

Professional standards for accredited programs call for assessment of students' competency in interprofessional skills while in training, yet little is known about how educators in this field perform this task.^{1,12} Beyond the simple activity of educating two professions within the same event, there must also be the assessment of benefits (both short-term and long-term) and effective translation into practice. The perceived benefit to newly trained students is also unknown and having this information could greatly improve the effectiveness of IPE through standardized use of common tools, shared techniques, and incorporating detailed feedback from educators about how organizations meet the education requirements. Herein lies the basis for this dissertation research within the field of nutrition and dietetics. Given that IPE was one of the main change drivers for future workforce demands covered in the latest Visioning Report 2017: A Preferred Path Forward for the Nutrition and Dietetics Practice,¹⁹ there currently exists a gap in the evidence and knowledge related to best IPE practices for educators in the field.

Present understanding of IPE demonstrates the need for further research particularly focused on the relationship between the types of IPE activities and the outcomes of self-confidence and competence surrounding IPCP achieved by new RDN practitioners. Potential areas of further exploration aim for learning more about the professional benefits gleaned from such learning experiences provided within pre-professional training programs or how entry-level dietitians perceive their competence related to interprofessional practice retrospectively. Thus, a deeper understanding of effective strategies for IPE of nutrition and dietetics students is needed.

Much like the work of Miller,²⁰ who originally pioneered a framework for assessment of clinical skills and competence in performance of medical students, the assessment of competencies in IPE depends on more intricate activities which involve authentic practice scenarios. These performance measures must be reliable and reproducible. Numerous theoretical models have been used to inform the understanding of IPE.^{1,13,21} For this project, constructs from the social psychology and adult learning domains were used to evaluate the outcomes of professional benefits, perceived values, and interactions related to IPCP and teamwork. The use of qualitative data from current educators provided rich context on the topic and facilitated future recommendations for educators. One key question evaluated is whether skills that are assessed in pre-professional settings will accurately predict how graduates practice independently and perceive the value of IPCP. The basis for this challenge in truly understanding the benefits of IPE comes from the unknown of tracking graduates and long-term outcomes. Until the experiences from the educational process are utilized in the professional setting, it is most difficult to predict their value and impact. According to Miller,²⁰ “this action component of professional behavior is the most difficult to measure accurately and reliably.”

Unique in its approach, this study deployed mixed methods research to identify current IPE practices within nutrition and dietetics programs. RDN practitioners within the first few years of independent practice participated in an electronic survey to collect data on program type, IPE activities, and reactions to these learning experiences. This information was further analyzed for significant findings and correlations and then informed the creation of a discussion guide for the second phase of focus groups of current program directors. The qualitative portion provided detailed information such as thematic elements, IPE activities within programs, and recommendations. Information gathered helped to identify

opportunities to improve the IPE practices in the education and training of future nutrition and dietetics professionals.

The specific aims of this project were to 1) determine new practitioners' perceived competence in interprofessional collaboration and practice (IPCP) using a quantitative survey; 2) complete qualitative focus groups with educators that will inform about current methods of student training and assessment for IPE competencies used in pre-professional programs for registered dietitians; and 3) integrate the quantitative and qualitative findings to identify and elucidate gaps in current educational practices and new practitioners' perceptions of their competency to provide recommendations for future steps for educators in nutrition and dietetics profession.

Chapter 1: Review of Literature

Interprofessional Education and Collaborative Practice

Historical Background

Within the past 15 years, health care policies and practices in the United States (US) have placed significant emphasis on team-based practice models to improve the quality, safety, and affordability of services. The need for an integrative and holistic approach to patient care has been recognized for over 50 years. According to the World Health Organization (WHO), interprofessional education “occurs when two or more professions learn with, about, and from each other to enable effective collaboration and improve health outcomes.”⁴ The WHO also promotes IPE as a key component in the education of future healthcare professionals, strongly supported by a large body of evidence demonstrating that IPE enables effective, collaborative patient care. In 1972, the Institute of Medicine (IOM) called for a national effort surrounding interdisciplinary education among health professions.⁵

Another development in the current landscape of IPCP comes from the Institute for Health Care Improvement with the IHI Triple Aim.²² This framework describes an approach to optimizing health system performance through the development of new health care systems which simultaneously pursue three dimensions: 1) improving the patient experience of care including quality and satisfaction; 2) improving the health of populations; and 3) reducing the per capita cost of health care. The US health care system is the costliest in the world, accounting for 18% of the gross domestic with national health spending is projected to grow at an average annual rate of 5.4 percent for 2019-28 and to reach \$6.2 trillion by 2028.²³ The implementation of the Affordable Care Act in 2010²⁴ furthered this national commitment with three primary goals to expand coverage of federal Medicaid to cover all adults below 138% of the federal poverty line, make health affordable insurance available to more people, and support innovative medical delivery methods to reduce health care costs in general.

Aging populations and increased longevity, coupled with chronic health problems, are a global challenge, putting new demands on medical and social services. Interprofessional education is recognized as the most effective strategy in preparing a collaboration-ready workforce.^{25 (p8)}

Interprofessional Collaboration Competency

The Interprofessional Education Collaborative (IPEC) formed in 2009 with six national education associations of health professions schools to promote and encourage constituent efforts that advance substantive interprofessional learning experiences. IPEC's mission is to ensure new and current health professionals are proficient in the competencies essential for patient-centered, community- and population-oriented, interprofessional, collaborative practice.²⁶ Overarching goals aimed to prepare future health professionals for enhanced team-based care of patients. IPEC now represents 21 national health professions associations. Eligible institutional members must be associations that represent and serve academic units at institutions of higher education that provide an educational program leading to the award of one or more academic degrees to students in one or more of the health professions that provide direct care to patients.

The IPEC Core Competencies were first adopted in 2011 and then updated in 2016. The performance guidelines have been widely disseminated throughout the health professions and embedded into both curriculum and accreditation standards. The most recent IPEC Core Competencies are now organized under a single domain of Interprofessional Collaboration to better integrate population health competencies; four topic areas are emphasized: values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork.⁶ These updates respond to shifts in the health system since the initial report was released, most prominently the increased focus is a result of the Triple Aim and implementation of the

Affordable Care Act. The updated standards more intentionally target the promotion of health across populations and the prevention of disease.

Interprofessional education has been widely accepted as the gold standard for training health professions students and is a common addition to professional curricula, driven by accreditation standards despite a limited base of evidence regarding its clinical effects, theoretical underpinnings, and social implications.¹¹ While research continues to build in this area, authors have suggested the next steps should be about studying practice,²⁷ predicting barriers,²⁸ understanding power and conflict,^{11,29} focusing on roles in collaborative practice,³⁰ and leveraging the type and amount of IPE in professional training.^{31,32}

A challenge in the overall mission here is the lack of one common set of accreditation standards that can be used to incorporate IPE universally across professional schools. Despite the recent emphasis to promote interprofessional collaboration in workplace and educational settings, most health professions have developed their own competencies for training students to be collaborative-ready. These are then translated into the profession-specific standards for the accreditation of professional programs. This situation is worth noting when considering the basis for the proposed study as it explains the need to evaluate the impact of IPE specific to nutrition and dietetics (ND) education as this is the most appropriate frame of reference currently available.

Collaborative-Ready Nutrition and Dietetics Practitioners

Registered Dietitian Nutritionists are a vital and integral part of most health care and health promotion teams. Within its first century, the profession enjoyed significant advances to remain “committed to helping solve the greatest food and nutrition challenges of the day through the transformational power of nutrition.”³³ The Accreditation Council for Nutrition and Dietetics (ACEND), an agency and accrediting body of the Academy of Nutrition and

Dietetics (AND), is now an active IPEC member to share in promoting interprofessional learning experiences in the preparation of future health care professionals. RDNs have ample opportunities within all of areas of practice to embrace IPCP in the provision of nutrition services. Interprofessional care greatly benefits all stakeholders in settings such as hospitals, rehabilitation services, behavioral health, food delivery systems, dialysis centers, specialty practice, maternal and child health, and sport dietetics.

The Commission on Dietetic Registration (CDR) “protects and promotes the health of the public by supporting practitioner competence, quality practice, lifelong learning, and career advancement.”³⁴ The CDR is the counterpart to ACEND in managing the quality of credentialed RDN practitioners who have successfully graduated and obtained registration. The agency produces validated, comprehensive guidelines³⁵ to define knowledge, skill, judgment, and attitude requirements throughout a practitioner’s career, across practice, and within focus areas. The competencies are a structured guide to help identify, evaluate, and develop the behaviors required for continuing competence.

The Essential Practice Competencies are broad and applicable to all practitioners using 14 spheres, 55 practice competencies, and 352 performance indicators³⁶ to drive competency-based practice and maintain continued competence in the profession. Many of these indicators specifically address the values and behaviors that embody authentic interprofessional collaborative practice. These include “soft skills” which are often difficult to measure objectively. Examples include critical thinking, decision-making, cultural sensitivity, judgment, and ethical practice.³⁵ Each is relevant in the discussion of interprofessional practice and the training of students who will soon be operating under these professional expectations.

Eliot and Kolasa³⁷ first generated greater awareness of IPE among ND practitioners and called for educators in the profession to train students and interns interprofessionally. The

authors articulated a threefold benefit from this explicit practice in the field of nutrition and dietetics. First, students gain collaborative skills which can be applied in practice and other areas of life. Second, universities will better position graduates for employment in changing health care environments. And third, interactive learning with other disciplines provides for a greater understanding of health systems as future providers. Early research suggests that ND students are enthusiastic about IPE.^{38,39} More recent studies strengthen the evidence the use of IPE in ND programs enhances students' perceptions and appreciation of IPCP.^{32,40,41} Therefore, it can be assumed from this positive association that RDN practitioners willingly carry forth these values and behaviors into their careers. Moreover, it is hoped that more RDNs step out as leaders in the IPCP arena to bring the profession of nutrition and dietetics to the forefront of this critical movement.

In the Visioning Report 2017, the AND issued a call for all health professions to “integrate IPE into their curricula to prepare practitioners of interprofessional practice with the knowledge and skills to be effective 21st-century members of the health care team.”¹⁹ In this report, creating collaborative-ready health professionals was noted as one of the major change drivers affecting the future of ND practice. Therefore, IPE is a necessary and meaningful component in training proficient RDNs. This study integrated data to inform the profession on better ways this can be accomplished with targeted results and the transference of lifelong values to deeper competence.

Performance Expectations of Entry-level Practitioners in Nutrition and Dietetics

The primary goal of ND education programs is to produce competent entry-level practitioners and prepare graduates to excel in their profession. This process is guided by workforce demands which continuously inform and shape the goals of pre-professional education. Assessment of competence during pre-professional programs utilizes a wide

variety of tools and methods to achieve the program goals. Educators can face great challenges in preparing graduates to meet the performance expectations. Programs must adhere to rigorous performance standards, defined scopes of practice, and continuous quality improvement efforts to assure that entry-level practitioners can deliver the performance expectations consistent with the RDN credential. Competency-based assessment practices in ND have been positively reported.^{42–46}

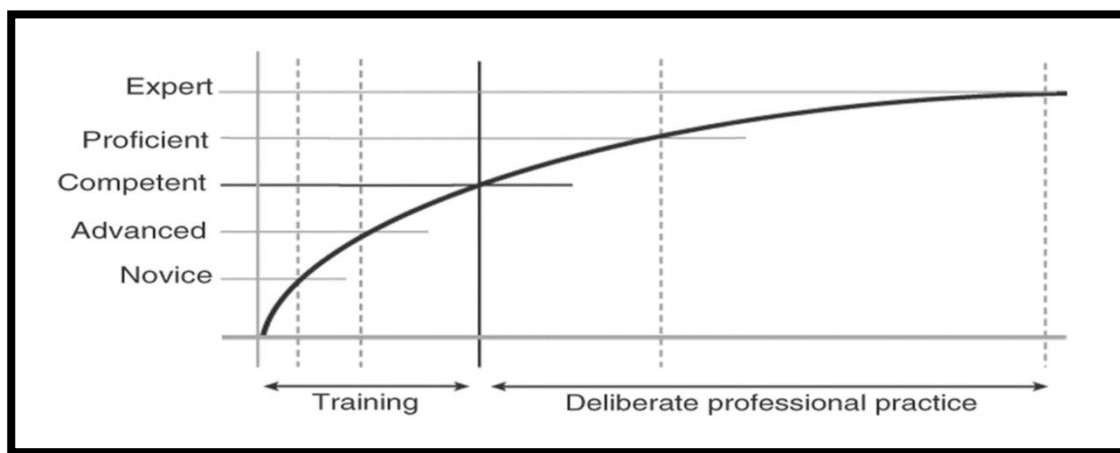
Relationship of Performance and Competence

More than 30 years ago, the Dreyfus brothers described a five-stage model of skills acquisition, first used by the US Air Force in pilot training.⁴⁷ This model has been used in various fields including medical education.⁴⁸ In the Dreyfus model, a learner acquires skills as a novice at one end of the spectrum to achieve expertise on the other. Towards the lower end, performance is rule-based and non-contextual. Performance tends to become fluid and intuitive at the higher end of the spectrum.⁴⁸ This relationship is portrayed in Figure 1, which is borrowed from the work of Ten Cate et al.⁴⁹ Competence is, therefore, a non-specific point in the middle of this spectrum of improving performance, transitioning the learner from training into deliberative practice.

Precise criteria to define competence in healthcare rely on the task at hand, the framework of a discipline, and a relational context in which the task is being taught or assessed. Generally, when individuals function at the level of competence, they have some experience and can make autonomous decisions. However, new practitioners tend to deal with complexity based on rules and analysis of a situation. In this model, skills acquisition is an ongoing process. Individuals use optimal training, deliberate professional practice, and extended domain-related activities to incrementally improve their performance.⁵⁰

These concepts apply to the field of nutrition and dietetics as well. Border and colleagues¹⁸ used the Dreyfuss model is producing Standards of Professional Performance for Registered Dietitian Nutritionists (RDNs) (Competent, Proficient, and Expert) in Education of Nutrition and Dietetics Practitioners. Herein the authors distinguish the levels based on the components of practitioner training. Didactic education (novice) and supervised practice (advanced beginner) precede credentialing entering the workforce as competent. From that point, practitioners manage their own professional development to achieve individual goals.

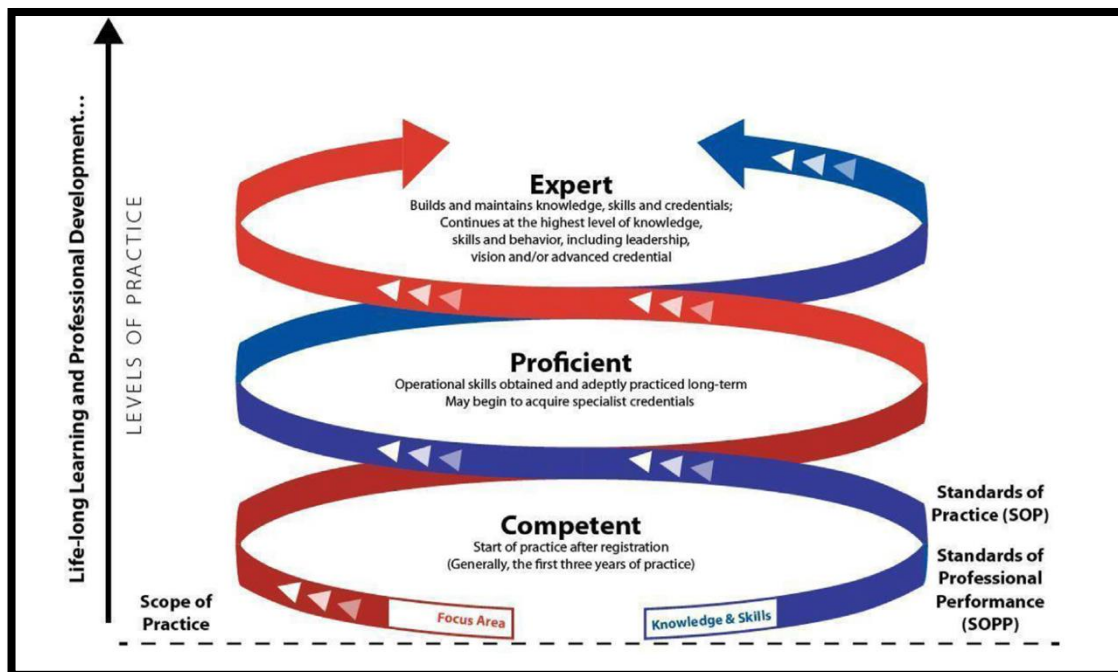
Figure 1. General curve of skills acquisition



This framework provides the basis for the three levels of practice described in the Standards of Professional Performance.¹⁸ A competent RDN has achieved the credential and can employ the appropriate knowledge, skills, behavior, and values in accordance with accepted standards of the profession. A competent RDN can apply knowledge and skills in a variety of practice areas and is considered entry-level. A proficient RDN practitioner has been in the field for three years or more since credentialing and has obtained operational job performance skills. RDNs in this group may have obtained advanced training or education, specialize in practice areas, and may hold leadership roles within organizations and professional associations. The expert practitioner is recognized within the profession and has

mastered the highest degree of skills and knowledge in nutrition and dietetics. Figure 2 displays the various levels of practice in this continuum published in the Standards of Professional Performance for Registered Dietitian Nutritionists.¹⁸

Figure 2. Standards of Professional Performance for Registered Dietitian Nutritionists



Accreditation Standards for Nutrition and Dietetics Programs

Incorporation of interprofessional education in ND programs became a reality when ACEND released the 2017 Accreditation Standards.³² Table 1 highlights the various standards related to IPCP aligned with the level of performance expected from a student to meet the competency. “Knows” defines knowledge acquired such as recall. “Shows” refers to the demonstration of skill as in simulation, and “Does” indicates a competency that students can perform independently with supervision. This level also demonstrates attitudes and softer skills that are often addressed in IPE learning activities. With the initiation of the Future Education Model Graduate Programs in 2018, the requirement for entry-level practitioners

was elevated to the graduate degree. This brought the related IPE competencies to a higher functioning competency level, appropriately integrated with operational behaviors. Updated standards, which take effect in June 2022, carry forth the advancement of interprofessional practice as a core competency to be actively developed and assessed in ND programs with no changes in these performance expectations. Regardless of a chosen pathway, RDN candidates are subject to competency-focused hiring upon graduation.⁵¹ Career readiness competencies from the National Association of Colleges and Employers (NACE) highlight critical thinking, problem solving, communication, teamwork, and leadership, which all align well with the IPE competencies.

Table 1. Accreditation standards for nutrition and dietetics pre-professional programs

Applicable Source	Standard	Competency Performance Level
2017 Accreditation Standards Coordinated Programs (CP); Didactic Program in Dietetics (DPD); Foreign Dietitian Education Program (FDE); International Dietetics Education Program (IDE)	KRDN 2.2 Describe the governance of nutrition and dietetics practice, such as the Scope of Nutrition and Dietetics Practice and the Code of Ethics for the Profession of Nutrition and Dietetics; and describe interprofessional relationships in various practice settings.	Knows
2017 Accreditation Standards Coordinated Programs (CP); Didactic Program in Dietetics (DPD); Foreign Dietitian Education Program (FDE); International Dietetics Education Program (IDE)	KRDN 2.5 Identify and describe the work of interprofessional teams and the roles of others with whom the registered dietitian nutritionist collaborates in the delivery of food and nutrition services.	Knows
2017 Accreditation Standards Coordinated Programs (CP); Dietetic Internship (DI); Foreign Dietitian Education Program (FDE); International Dietetics Education Program (IDE)	CRDN 2.3 Demonstrate active participation, teamwork and contributions in group settings.	Shows
2017 Accreditation Standards Coordinated Programs (CP); Dietetic Internship (DI); Foreign Dietitian Education Program (FDE); International Dietetics Education Program (IDE)	CRDN 2.4 Function as a member of interprofessional teams.	Shows
2017 Accreditation Standards Coordinated Programs (CP); Dietetic Internship (DI); Foreign Dietitian Education Program (FDE); International Dietetics Education Program (IDE)	CRDN 2.6 Refer clients and patients to other professionals and services when needs are beyond individual scope of practice.	Shows

Future Education Model Graduate Program (FG)	FEM 5.2.10 Understands and respects roles and responsibilities of interprofessional team members.	Does
Future Education Model Graduate Program (FG)	FEM 7.2.2 Works with and facilitates intraprofessional and interprofessional collaboration and teamwork.	Does

Interprofessional Training Models

An extensive review of literature conducted in spring of 2021 provided a broad base of resources and empirical results about how various educational settings carry out IPE and the effectiveness of these activities. Common examples include workshops,^{52,53} facilitated online learning,⁵⁴ simulation-based learning,^{45,53,55–57} and service-learning courses.^{27,44,58,59}

The work of Darlow and colleagues^{60,61} presents unique attributes in the field with some early studies that stood out. In 2016, they were one of the first to show effective IPE results using a clinical trial, intervention method with an 11-hour interprofessional program focused on management of long-term conditions. Significant findings were reported for self-reported ability to function within teams, self-reported confidence, knowledge gained, and ability to manage chronic conditions. Students came from dietetics, medicine, physiotherapy, and radiation therapy. The authors concluded that this type of IPE experience has “positive effects and contribute to the development of health professional who are ready to collaborate with others in order to improve patient outcomes.”⁶⁰ A follow-up publication⁶¹ provided the qualitative findings of the intervention program. Three key themes emerged. 1) The program offered valuable learning; 2) Participants associated a direct relevance to their future practice; and 3) A student-led process provided the most meaningful learning experience.

Interprofessional education from the perspective of ND is also successful. While IPE encompasses many professions and should be evaluated on a universal global scale,⁶² the background review included studies published in the field or included a specific measurement on the impact to student dietitians. This was important to inform the methodology of this

study. Earland et al³⁸ using a mixed methods design demonstrated enhanced students' perceptions about the value of roles on a team, especially that of the dietitian and understanding of the interprofessional working environment. In a cross-sectional study with 418 undergraduate students at Monash University, Williams et al⁶³ found strong positive correlations in students' attitudes about collaboration, teamwork, learning and communication. Professions included were emergency health, nursing, midwifery, occupational therapy, and nutrition and dietetics. Of note, the authors reported the highest mean ratings to both the value of teamwork and the support of collaborative learning were provided by dietetics students. Other studies demonstrated similar results.^{39,41,64}

Looking to understand the level of participation in and institutional readiness for IPE within ND and athletic training (AT) programs, Eliot and colleagues⁶⁵ published results from a quantitative survey sent to program directors. This first-of-its-kind study showed that ND programs had a higher rate of participation than AT programs, and ND faculty showed significantly higher rates of faculty participation. No further similar studies were located. Conclusions stated that many factors influence (promote or deter) IPE initiatives in the field, but the need for increased development of IPE was confirmed. Building on this effort, Lewis, Eliot and others⁶⁶ determined if previous IPE experiences impact the confidence to identify interprofessional competencies among practicing dietitians. The study also examined the relationship between previous exposure to IPE and the variables of perceived value of collaboration, attitudes, communication, and role clarity. This tenant provided the idea of asking similar questions within the target population of this proposed study.

The ND profession greatly benefits from active educators who have successfully implemented IPE and are working effectively with other professions to carry out the mission on integrated, collaborative practice. Future recommendations for IPE program leaders are based on a strong base on evidence that is now available.^{2,62} These are 1) multiple methods of

learner assessment to measure knowledge, skills, and behavior over time in various contexts are needed; 2) behaviorally-based assessments are also needed to demonstrate acquisition of interprofessional competencies; and 3) frameworks that link a learner's performance with team and patient outcomes at stages in the learner's development (such as milestone projects) would promote a powerful connection between all the various assessments.

Competency-based Education (CBE) as a Way Through

As global shifts in health care delivery systems occur, so too must go the ways that professional students are trained. With a focus on patient-centered and outcome-driven models of care, changes in the workforce must drive changes in the educational process. Therefore, it is crucial to prepare future practitioners who can acclimate and thrive in the ever-shifting health care landscape. Health professions students must learn the sufficient skills and attitudes to not only be responsive to patients but also be able to adapt to the needs of the settings in which they practice. To accomplish this level of competence, graduates of pre-professional programs must think critically and apply knowledge in such a way that is medically, culturally, and socially appropriate. For educators, close examination of the educational and assessment practices is an ongoing requirement to best deliver. Competency-based approach to education is one that is fundamentally flexible and outcome centric.⁶⁷

The framework of competency-based education (CBE) first emerged in 1978 through a publication by the WHO.⁶⁷ A stark comparison between subject-centered curricula and competency-based curricula highlighted the gaps between traditional medical education and the requirements of clinical practice. The introduction of CBE into practice began in 1999 when the Accreditation Council for Graduate Medical Education and the American Board of Medical Specialists mandated a shift to outcomes-based model of training.⁶⁸ Generated out of the public concerns about the quality of health care, this mandate raised the expectations of

new graduates to be competent in areas beyond medical knowledge and practice skills. This initiative paralleled concurrent efforts of the Institute of Medicine (now known as the National Academy of Medicine). *Crossing the Quality Chasm: A New Health System for the 21st Century*⁶⁹ demanded improvements in the education and training of health professionals.

About this same time, Hugh Barr⁷⁰ promoted the makings of a framework in which interprofessional competences for collaboration between professional practitioners might be defined as the ability to:

- Describe one's roles and responsibilities clearly to other professions and discharge them to the satisfaction of those others.
- Recognize and observe the constraints of one's own roles, responsibilities, and competence, yet perceive needs in a wider framework.
- Recognize and respect the roles, responsibilities, competence and constraints of other professions in relation to one's own, knowing when, where and how to involve those others through agreed channels.
- Work with other professions to review services, effect change, improve standards, solve problems, and resolve conflicts in the provision of care and treatment.
- Work with other professions to assess, plan, provide and review care for individual patients, and support carers.
- Tolerate differences, misunderstandings, ambiguities, shortcomings, and unilateral change in other professions.
- Enter into interdependent relationships, teaching and sustaining other professions and learning from and being sustained by those other professions.
- Facilitate interprofessional case conferences, meetings, teamworking and networking.

These targeted competencies can be achieved by all students who experience IPE, regardless of their respective disciplines. However, converting broad competencies into measurable attributes does present challenges in the implementation of CBE.⁶⁷ One reason, as previously noted, is the individual accreditation standards that drive program educational activities.

Other barriers to the full implementation of IPE include lack of consistency in instruments,^{2,71} unprepared faculty,¹² and a need for longitudinal evidence.⁷²

Similar issues are reported in nutrition and dietetics education, limiting the ability to fully embrace this practice.^{40,65,73} Moreover, little is known about what changes occur and how the IPE competencies are maintained after a student completes the program. Such is the basis for recommendations provided by Davis and Affenito⁷³ related to creating and

sustaining high-performance teams. Validated IPE outcome measures in this field are needed to produce the evidence of achieved goal outcomes. Further, future assessments need to focus on how IPE standards are being met rather than if IPE is included in ND curricula.³²

Kirkpatrick/Barr's Hierarchy of Learning

Moving forward with the assessment and evaluation of IPE within teams, the most widely accepted and validated framework to evaluate learning outcomes from educational initiatives is the Kirkpatrick/Barr hierarchy.^{2,71} Donald Kirkpatrick⁷⁴ provided the first iteration of this concept in 1996 with four levels of learning achieved in IPE which was later adapted by Hugh Barr⁷⁰ and then further refined by Freeth et al⁷⁵ in 2005. Table 2 provides an overview of the various levels in the hierarchy of learning. Basic outcomes that can be evaluated are reactionary. Learners express how they felt about experiences and could be aligned with the learner's satisfaction with the IPE initiative. Moving upward, the second level measures changes in attitudes and perceptions towards IPCP and other professions (2a), as well as gains in terms of related knowledge and skills (2b). The third and fourth levels of the hierarchy move from an individual perspective to how, if at all, the experience changed the learners' approach to professional practice and how those changes might impact the organizational structure and patient outcomes.

While Kirkpatrick/Barr's taxonomy of learner outcomes is used frequently in the literature, especially in large-scale reviews and evaluation studies^{2,76,77} other models were noted in the literature.⁷⁸⁻⁸⁰ Given that this proposed study aims to qualify how learners' knowledge, skills, and attitudes are assessed in pre-professional ND programs, this model will serve the study well in comparing data collected to these learning outcomes.

Table 2. Kirkpatrick/Barr's hierarchy

Levels of Learning Outcomes		Behavioral Descriptions
Level 1a	Reaction	Learners' views on the learning experience and its interprofessional nature
Level 2a	Modification of attitudes/perception	Changes in reciprocal attitudes between participant groups. Changes in perception or attitude towards the value and/or use of team approaches to caring for a specific patient/client group.
Level 2b	Acquisition of knowledge and/or skills	Including knowledge and skills linked to interprofessional collaboration.
Level 3	Behavioral change	Identifies individuals' transfer of interprofessional learning to their practice setting and their changed professional practice
Level 4a	Change in organizational practice	Wider changes in the organization and delivery of care
Level 4b	Benefits to patients/clients	Improvements in health or well-being of patients/client

Learner Assessment

An extensive variety of assessment and evaluation tools has been reported in the literature. These methods include examining the performance of individual learners or groups of learners and the assessment of IPE programs, which is more clearly defined as evaluation. These however are often used within the context of a specific program, and longitudinal data are not yet available.² This discussion about effective options available to assess students' performance in IPCP knowledge, skills, and attitudes could nearly be endless. To support the intended research aims of this study, a review of more recent and relevant work is provided to highlight how educators currently assess learners related to IPE activities.

Learner assessment is most definitely driven by the type of IPE activity provided, and the resulting outcome measures take into consideration the performance expectations of the participants. A plethora of surveys, questionnaires, learner and team assessments, and activity or program evaluation tools can be found through the National Center's Resource Exchange (Nexus)⁸¹ and the Canadian Interprofessional Health Collaborative (CIHC).⁸² Typically, the focus of assessment is on the desired outcomes for change. Most measure attitude and are

more subject-related, which is one of the known challenges. Table 2 displays a summary of common educational outcomes.⁷⁹ There is little information available to fully understand the implications in ND education, and a summary of what was found is represented below. Thus, this project adds to the knowledge as the profession moves to the next level in IPE.

Table 3. Education outcome categories with examples for IPCP

Knowledge	Skills	Behaviors	Affective Status
“Knowledge of...” <ul style="list-style-type: none"> • Own profession • Other professions • Job duties • Cost-effective care • Patient-centric care • IPCP pathways • Quality measures • Teamwork • Patient safety • Health care systems • Triple Aim 	“Skilled in...” <ul style="list-style-type: none"> • Call etiquette • Hand-off transitions • Documentation • Safety protocols • Leading meetings • Communication • Conflict negotiation • Collaborative practice • Leadership 	“Demonstrates...” <ul style="list-style-type: none"> • Professionalism • Ethical decision-making • Timely consults • Collaborative decisions for care • Effective end-of-life discussions 	“Has...” <ul style="list-style-type: none"> • Attitudes • Beliefs • Feelings • Perceptions • Self-confidence • Self-efficacy • Locus of control

It is confirmed that early integration of IPE into health professions education is critical to successful development of future IPCP. However, students need the opportunity to practice these skills intentionally through authentic learning experiences. Systematic and global methods will continue to emerge in the proximal future of ND education and practice. Interprofessional education involves critical assessment of less tangible outcomes. Expected competencies include many soft skills and attitudes that are difficult to capture objectively or observe in behaviors. Norris et al⁸³ first presented validation of a novel tool (Interprofessional Attitudes Scale or IPAS) to effectively measure four unique domains of interprofessional competency and recommended its application across all professions. Research in the field of social work examined students’ attitudes and readiness for interprofessional education and practice using the Readiness for Interprofessional Learning Scale (RIPLS).⁸⁴ The authors

discussed applications in which professional identity can be fostered within the profession and within collaborative teams.

The work of Frost and colleagues⁸⁵ designed and tested the interprofessional assessment (IPA) observational tool with promising results, laying a foundation to assess interprofessional professionalism across multiple health professions (10 were used in this study) and within different practice settings. Six domains were assessed: altruism and caring, excellence, ethics, respect, communication, and accountability. Hinyard et al⁸⁶ validated a tool which effectively measures the impact of curriculum on students' self-assessed collaboration in both clinical and non-clinical settings. All options showed marked improvement over earlier instruments which lacked psychometric validity and attention to behavioral aspects and teamwork values/beliefs.^{87,88}

The assessment of teamwork also remains elusive, but examples were found to confirm that effective outcomes can be measured. Havyer and colleagues⁸⁹ provided a systematic review of 73 unique tools to evaluate teamwork within the application of internal medicine. They confirmed there is still a need to connect the aspect of effective teamwork with patient safety and long-term results in health care settings. Similar results were also found by Shoemaker and colleagues⁹⁰ in primary care. Schmitz et al⁹¹ has further added to the evidence that collaborative behaviors can be effectively measured within interprofessional teams. The Interprofessional Collaborative Competency Attainment Survey (ICCAS) uses self-reporting and Likert scale ratings to ascertain collaborative practice and attitudes but was found with extensive overlap in the domains and weak in the ability to clearly define the significance of relationships between internal ratings and external measure of collaboration.

All this discussion leads to support the theoretical framework of this study. The work of Dow⁹² and then later publications by Lockeman and Dow^{93,94} validate that educators need simple, reliable, and accurate tools to measure interprofessional competency. With the goal to

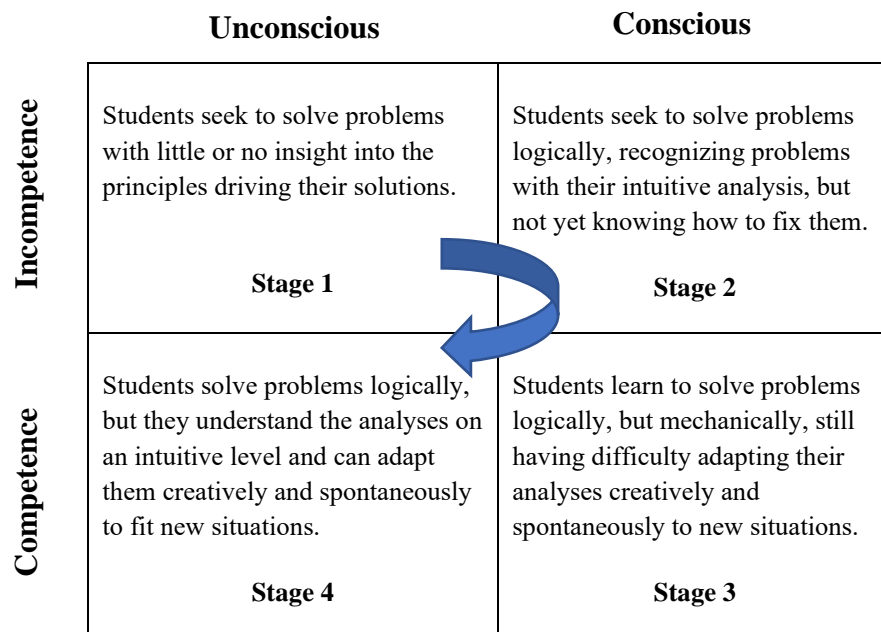
inform curriculum planning and effective learner assessment in IPE, their instruments have continuously been tested and validated with great certainty to provide data that can be used within and between institutions to compare programmatic outcomes. This will move IPE into the realm of global assessment. The most recent version published (Version 3) was used in this project to focus on the two most relevant domains (factors) of collaborative practice: interprofessional interactions and interprofessional values. This tool was incorporated into the RDN practitioner survey to provide quantitative data which was analyzed to test the research hypotheses.

Conscious Competence

A final concept worthy of exploration within this project entails the learning theory of conscious competence. In pursuit of lifelong learning and achieving mastery-level expertise within a profession, the conscious competence model is a tool to gauge ability and mental aptitude in accomplishing tasks.^{95,96} The origins of this theory are unclear, but it is generally attributed to William Howell.⁹⁷ This model, which incorporates four stages of competence, is a useful framework to assess self-proficiency as well as that of peers and mentors. It also has a great appeal in the applications of experiential learning, and thus IPE. Figure 3 depicts a model of learning along two dimensions, consciousness and competence, progressing from unconscious competence where an individual does not have the requisite skills required for a task. Conscious incompetence permits an individual to understand there is a lack of ability in comparison to peers' performance and skills. In this stage, a choice emerges to act and gain new skills and knowledge to move to the next tier or remain incompetent. Conscious competence is where most people fall in their respective fields of expertise. At this level, people have the appropriate skill set to accomplish tasks effectively. This level requires intentionality, concentration, and attentiveness to demonstrate those skills. Finally, unconscious competence at the fourth tier is only achieved by the elite of the group. People

have honed their abilities so much that their actions are now innate or second nature. This concept has served simulation training,^{95,97} various health care applications,⁹⁸ and teaching cultural competency.⁹⁹

Figure 3. Conscious competence model



There is an important link between conscious competence and the mindset of inquiry.¹⁰⁰ Inquiry is defined in various ways, however, within the realm of cognitive science, it is the rigorous apprenticeship and disciplined expertise of making meaning out of learning. It is also learning how to solve problems and design solutions by using the stances and strategies of expert practitioners. Fostering and promoting educational practices in this light will help students recognize and frame problems, analyze and identify patterns, interpret information, explain what has been learned, share how to apply what is learned so it provides ways forward, solutions, and services to others. It is the process of reflecting and learning from experience, of outgrowing oneself, and improving one's capacities over time: in other words, inquiry is the process of understanding.

Many studies have demonstrated the case for creating a culture of inquiry in professional practice and in student learning. One renowned study by Fred Newman and his colleagues¹⁰¹ involved 24 schools and more than 2300 students. Significantly higher levels of learner engagement and achievement were found in settings that promoted the sense of inquiry and questioning. In this example, inquiry practices were shown to have a more positive impact on student performance than any other factor, including prior achievement and background.

While the purpose of this study is not aimed at understanding the various cultures and settings in which ND students learn and experience IPE, it did seek to understand the relationships between IPE activities and the long-term effects of these experiences in professional practice. Therefore, outcome measures are considered in the realm of conscious competence and add meaningful interpretation. Ideally, transference of affirmative values and behaviors that support IPCP which are intentional. The future of the nutrition and dietetics profession depends on practitioners who envision themselves as valuable, productive, and engaging members of the health care team and who are ready to lead interprofessional collaborative practice.

Gap Analysis and Basis for the Dissertation Study

Upon an extensive review of the literature in the field of interprofessional education, several conclusions came to light and were synthesized to initiate this unique project. First and foremost, there is no doubt that IPE is the future of health professions training models for pre-professional students and continuous quality improvement in patient care. Secondly, many authors provided a solid base of evidence that IPE activities are effective in achieving learning objectives around knowledge, skills, and attitudes to promote collaborative practice. New developments constantly improve efficiencies and benchmarks across broad audiences

and organizations. Professional associations continue to support and strengthen practitioners' and educators' abilities to engage in effective IPE through authentic experiences to transform learners. There are national and international initiatives which provide frameworks and standards of practice to not only promote but effectively sustain IPE and IPCP. There is scant information on how IPE transfers into long-term practice and what kinds of IPE activities are associated with a learners' perception of competency after finishing a pre-professional training program. Finally, there was an optimistic opportunity to systematically examine current education practices to determine ideals within a target profession and across a universal horizon of true interprofessional collaboration.

Eliot and colleagues³² reported that the field of nutrition and dietetics still has much work to do to fully embrace interprofessional education in the training of its students. A more recent publication in 2021 from Koemel and colleagues⁵¹ noted that "very little research exists on career readiness competencies" within ND programs. The authors compared the framework of workforce hiring competencies from the National Association of Colleges and Employers (NACE) with those from accredited dietetics programs and recommended that future research should evaluate the different pathways to becoming an RDN, incorporating career readiness. This study sought to address this challenge and incorporate the expertise of this researcher in applying a mixed-method, scientific analysis of the problem.

Chapter 2: Theoretical Framework

Purpose Statement

The focus of this study was to evaluate the impact of IPE activities used in training nutrition and dietetics students on the transference of values and competencies related to interprofessional collaborative practice in newly credentialed RDNs. There are numerous, well-established theories relevant to IPE and IPCP¹³ which cover a wide range of outcomes for individuals, teams or groups, and organizations or systems.¹³ Table 2 provides an overview of theories currently applied to interprofessional education and interprofessional practice as presented by Reeves et al.¹³ As the primary aim of this study drove at the effectiveness of the educational process during pre-professional ND programs and considered the outcomes of IPE activities on individual professional competencies, the selected theories and related constructs used as the underpinning framework are discussed next.

Table 4. Overview of applied theories in interprofessional education

Perspective	Theories/Theorists
Social Psychology	Contact theory (Allport) Groupthink (Janis) Group development (Tuckman and Jensen) Social exchange theory (Challis et al) Cooperation theory (Axelrod) Relational awareness theory (Drinka et al) Team reflexivity (West) Realistic conflict theory (Brown et al) Social identity theory (Ellemers et al) Social learning theory (Bandura and Cervone) Self-categorization theory (Turner) Transformation/transactional theory (Bass)
Sociology	Discourse theory (Foucault) Surveillance theory (Foucault) Self-preservation theory (Goffman) Negotiated order perspective (Strauss) Professionalization theory (Freidson) Practice Theory (Almas) Power and influence theory (French and Raven)
Adult Learning	Reflective learning (Schön) Problem-based learning (Barrows and Tamblyn) Experiential learning (Kolb) Situated learning (Lave and Wenger)

Systems	Systems theory (Von Bertalanffy) Presage-process-product (Biggs) Chaos (Krippner) Complexity (Cooper) Activity theory (Engestrom)
Psychodynamic	Loss and change (Marris) Social defense (Menziess) Work-group mentality (Bion)
Organizational	Organizational learning (Argyris and Schön) Punctuated equilibrium (Gersick) Institutional theory (DiMaggio and Powell)

Social Psychology Theories

The foundation of desired competencies in interprofessional education and practice naturally leads to theoretical frameworks which use social contexts to understand and explain how individual thoughts, feelings, and behavior are influenced by the actual, imagined, or implied presence of other people.¹⁰² Social psychology helps to answer questions like, “What shapes a person’s attitude?” or “Why are some people more effective leaders?” or “How does bias develop and how does one overcome it?” Thus, select theories under this realm align well with the goals and learning objectives of IPE. As such, using these constructs aids in the evaluation of numerous variables to address the first and second aims of this project.

Intergroup Contact Theory

Given that IPE by its very nature promotes more than one professional group coming together for a shared learning experience, Intergroup Contact Theory proposes that the most effective way to reduce tensions between different groups is to bring them together. First developed in 1954 in the context of social policy issues and racial disparities, Allport^{103,104} stated that simply placing people together is not sufficient to bring about a positive change. Contact between groups, even in limited situations, is highly associated with reduced bias; further, contact also enhances explicit self-report measures as well as implicit measures of people’s willingness and ability to report their feelings and beliefs. Expanding on this work,

Hewstone and Brown¹⁰⁵ later identified three conditions which must also be met to reduce prejudice 1) equality in the status of groups, 2) common goals shared between the groups, and 3) groups that cooperate during their contact experience. Furthermore, positive contact is associated with reduced physiological threat responses to outgroup members and helps to focus on understanding differences and similarities among the group members.

To create more effective learning environments for IPE, Intergroup Contact Theory is a useful theoretical framework for educators as it integrates concepts of stereotypes, social groups, and hierarchy, which can naturally occur in the health professions and other formal structures. Research in contact theory highlights the importance of organizational support and advocacy of more positive intergroup relations. Rademaker et al¹⁰⁴ used this theoretical basis to evaluate social participation in inclusive education models through a systematic review. The authors reported that the best results are achieved when contact and information are combined, and this educational method produced more positive attitudes. Contact Theory was also used to measure changes in undergraduate students' perceptions and attitudes towards IPE using simulation-based teaching by Mohaupt et al.¹⁰⁶ This was one of the first studies to link the evaluation of an IPE one-day workshop experience to a theoretical framework with pre-professional students. The authors concluded that by dedicating careful attention to required elements and conditions of intergroup contact theory, educators can develop teaching and learning strategies that are conducive to achieving the interprofessional competencies that graduating professionals will need in practice. Finally, a recent study demonstrated the effectiveness of contact theory in significantly improving empathy and shifting positivity in perceptions of other health professionals to meet the IPEC competencies through pilot I-TEAM program.¹⁰⁷ This finding is relevant in the consideration of how early practitioners perceive their own professional competency and interactions in current practice.

Therefore, contact has been shown to have significant value in reducing prejudice and promoting more positive intergroup attitudes and collaborative practice. Such research has important, broad implications for policy work and higher education. For this dissertation project, the construct of Intergroup Contact Theory was used to analyze the relationship of the various IPE activities to the outcome of practitioner competence in IPCP. Implications of this application in IPE could be measured in individual values and motivation towards collaborative practice²¹ and tie that back to the type of learning experiences encountered.

Social Identity Theory

Another potential theory that can assist in understanding how practitioners perceive the value and effectiveness of IPE is related to the Social Identity Theory.¹⁰⁸ Shared training can enhance students' identification with their own profession and reinforce a feeling of usefulness on the team. Social identities are taught through the socialization process. Each health discipline embodies a unique professional culture that influences the educational experience of its members through curriculum content, core values, customs, dress, and professional symbols for example. Members in one profession typically share a similar impression of the meaning, attribution, and etiology of symptoms, what constitutes health and wellness, and strategies to approach services.¹⁰⁹ Professional culture also influences the means of distributing power within the work environment, how conflict is managed, and how decisions are made. These all have important implications in assessing the effectiveness of students' training in pre-professional programs. Moreover, social identity ties to how entry-level practitioners perceive their values and interactions through a reflective process. This concept has similar indications to other sociological theories like Practice Theory and Professionalization Theory. These constructs have been used to inform interprofessional practice by examining the process by which entrants into a certain professional group come to

hold a collective identity through common learning experiences and secure exclusive ownership of specific areas of knowledge and expertise.²¹ However, the priority issue in this investigation was the focus on self and reflective practice, and these would not be the best fit.

Referring to the IPEC Core Competencies,⁶ this theory has merit related to all four competencies: interprofessional teamwork and team-based practice, values/ethics, interprofessional communication practices, and roles and responsibilities. Within IPE experiences, the framework of IPEC competencies can build on learning activities that explore multiple roles, teamwork, and communication in the socialization process to a professional identity. McGuire et al¹⁰⁸ used this theoretical model to assess the effectiveness of an interprofessional course in ethical decision-making provided to over 2100 pre-health professions students. Results indicated that the educational experience provided students the opportunity to think critically and work collaboratively with other health professions students. The authors concluded that the concurrent and reciprocal process of developing both a professional and interprofessional identity may facilitate the development of an integrated identity. As such, students embrace their chosen profession while seeking collaboration with others to provide high-quality care for all patients. For this study, Social Identity Theory served as the construct for evaluating how entry-level practitioners perceive their value and interactions related to interprofessional practice.

Transformational Leadership Theory

Transformative learning theory proposes that learners can adjust their thinking based on new information. Significant to adult education and young adult learning, Jack Mezirow's initial research on adult women returning to school theorized that adults typically seek new perspectives to gain a new understanding of things as they change rather than apply an old understanding to new situations. Further, students had important teaching and learning opportunities connected to their past experiences. Critical reflection and critical review lead

to a transformation of their understanding.¹¹⁰ This concept aligns well with promoting a growth mindset¹¹¹ wherein individuals welcome new challenges and learn from them and therefore increase their abilities and achievements. While focused on the learning process, this educational concept carries forward into the basic tenants of Transformational Leadership Theory, which is another possible theory applicable to IPE under the social psychology. A transformational leader adopts a democratic approach to work, demonstrates flexibility with the team members, and promotes creative problem-solving.¹³

As the profession of nutrition and dietetics depends on motivated leaders who are willing to step into new areas of practice and run interprofessional teams, this aspect becomes important in measuring the outcomes of the educational process related to IPCP. In a scoping review, Brewer et al¹¹² reported a very limited number (< 25%) of the 114 articles included referred to a specific leadership approach. Additional findings noted that most articles did not define, describe, or theorize leadership, and “leadership” capabilities were rarely identified. Articles generally focused on health practitioners and educators or students as leaders with little exploration of leadership at higher levels such as professional, executive, accrediting bodies, or government. Thus, a need is supported for more critical examination of interprofessional leadership and the required abilities to lead the changes required in both education and practice settings. Indicators on the practitioner survey link to attitudes about seeking new opportunities for IPCP, thus the implications of a leadership mindset. This attribute also served in the qualitative assessment to help identify gaps in current educational practices, and it supported the basis of understanding how pre-professional education in IPE carries forward into the current perceptions and beliefs of early-career dietitians.

Adult Learning Theories

In general, there is limited use of adult learning theories reported in the literature related to IPE.^{13,21} However, in reviewing these articles, it is noted that authors, especially educators, tend to implicitly draw upon the principles of adult learning theories. As the researcher is a practitioner in higher education, the connection to the learning process is an essential component of this project and requires some attention. Many examples could fit the IPE model such as problem-based and situated learning. These were felt to be most closely represent teamwork and collaborative practice. Therefore, three applicable theories are included to further support the development of the theoretical framework surrounding practitioner competence and beliefs, which is more of an individual perspective.

Reflective Practice Theory

To produce collaborative-ready nutrition and dietetics practitioners who embrace interprofessional practice, only a limited understanding of what happens when knowledge is integrated into practice in a meaningful way or how knowledge is generated from practice has been reported.¹¹³ Grounded in the roots of Constructivism, which is a theory about how learners gain knowledge through active learning and social experience, reflective practice is used as a professional development strategy.¹¹⁴ Originally described in 1974 by Argyris and Schön and then further developed by Schön in 1987¹¹⁵ as a learning strategy for professionals, the primary goal in Reflective Practice Theory is a behavioral change. Specifically, a change in the dimensions of professional practice is desired. From a learning perspective, the most crucial component of this model is the theory-in-use, which is what this project aimed to address. Deeply internalized beliefs or assumptions about cause-effect relationships can shape behavior. If the goal of professional development is to improve practice, the constructs of this theory affirm that success can be achieved only by exploring and modifying existing theories in use.

Constructivism and reflective practice both emphasize the importance of a conceptual conflict or problem as a stimulus for learning. These principles suggest strong applications to IPE and will lead to more effective learning and reaching the goal of competent action or improved performance. The importance of cognition is also highlighted, driving home the principle that ideas influence action. Both theories identify the importance of understanding prior knowledge as a basis for cognitive development. Learning begins with a personal desire to learn; this factor becomes a key responsibility of educators to stimulate the learners' interests. This concept ties back to the relevancy and type of educational experiences offered to pre-professional students. Strategies are needed to redefine the purpose of learning, and their application in the professional development setting facilitates the integration of theory into practice. In this study, several items in the research survey asked participants to use reflective practice to generate information and data variables.

Experiential Learning Theory

Interprofessional education should be the epitome of experiential learning. Not every IPE activity includes this concept, yet the construct of Experiential Learning Theory supports that the most effective learning occurs when participants learn by doing. David Kolb first published his work on experiential learning in 1984, noting the influence of other great theorists including John Dewey, Kurt Lewin, and Jean Piaget.¹¹⁶ To best facilitate knowledge transfer, Kolb defined learning as “the process whereby knowledge is created through the transformation of experience.”¹¹⁷ Accordingly, the transformation of experience into usable knowledge takes place in a four-stage learning cycle: 1) concrete experience when learners immerse themselves in new experiences; 2) reflective observation when learners reflect on those experiences; 3) abstract conceptualization when learners form ideas and integrate their observations into action; and 4) active experimentation stage when learners actively engage in the experience and test previous concepts.

Previous work in IPE using Kolb's theory provides a general basis for understanding the impact of experiential learning on the effectiveness of learning activities.^{61,75,118} More recent research uses this construct in varying applications such as nursing education,^{119,120} interdisciplinary teams,¹²¹ disaster simulations,⁵⁶ and training pre-health undergraduates.³⁰ The primary goal of experiential learning is to enhance students' development and educational experiences by providing more opportunities for real-world learning. Emphasizing student growth as an objective measure, experiential learning can be a dynamic approach in which students engage, apply, collaborate, and reflect on course content and lessons learned.¹²² This theory integrates and supports the concept of reflective practice and provides the basis for a few outcome measures incorporated into the quantitative survey tool for RDN practitioners.

Self-Efficacy Theory

Intrinsic motivation related to academic pursuits can be used to explain students' behaviors. Self-efficacy is a theoretical construct directly related to confidence and refers to a person's judgment the ability to perform a task at a specified level of proficiency. This represents the person's belief that he or she can (or cannot) perform the required task, and it is correlated with achievement-related behaviors, including motivation, cognitive processing, performance, self-worth, and choice of activities. Efficacious learners are more likely to be strategic, self-regulating, and metacognitive than less efficacious learners.¹²³ This theory has strong implications in IPE since those who see themselves as capable are more likely to engage in adaptive behavior and achieve mastery skills, compared with those who are less efficacious and tend towards ego and performance-oriented manners.¹¹¹ Having the ability to exercise control of factors in the learning or work environment can also reduce stress triggers that can provoke anxiety. For students to develop into proficient, autonomous practitioners, the educational process should ideally foster feelings of competence and control. Perceived meaning is an important consideration in understanding motivated behaviors. It also reflects

upon the learning activities, educational process, and inherent relationships as a student moves through the curriculum and into autonomy. Therefore, the choice to approach or avoid a challenge could be significantly influenced by competency self-perceptions.

IPE is the comprehensive learning process to achieve common goals by applying collaboration with other professions in seeking promotive, preventive, curative, and rehabilitative efforts to improve the quality of care. Thus, the intentional application of self-efficacy measures during IPE learning activities should improve the outcomes in creating collaborative-ready practitioners. This positive correlation was confirmed by Akhmad et al¹²⁴ in health professions and medical students. Holthaus et al¹²⁵ demonstrated an increase in self-efficacy in dietetic students following a training course. It was noted in the findings that an increase in dietetic student self-efficacy is crucial, as “it has been demonstrated that beliefs of self-efficacy affect behaviors and outcomes and play a large role in future improved performance and in meeting clinical competencies.” The authors also called for future research to determine whether the increase in self-efficacy that was experienced as students is carried into their professional roles to enhance patient outcomes, and this has also been reported by others.¹²⁶ This shows a direct link to the dissertation study and supports the basis for practitioners’ level of self-rated proficiency in IPCP and its relationship to the IPE activities experienced in pre-professional programs.

Conclusions and Applications to the Research Project

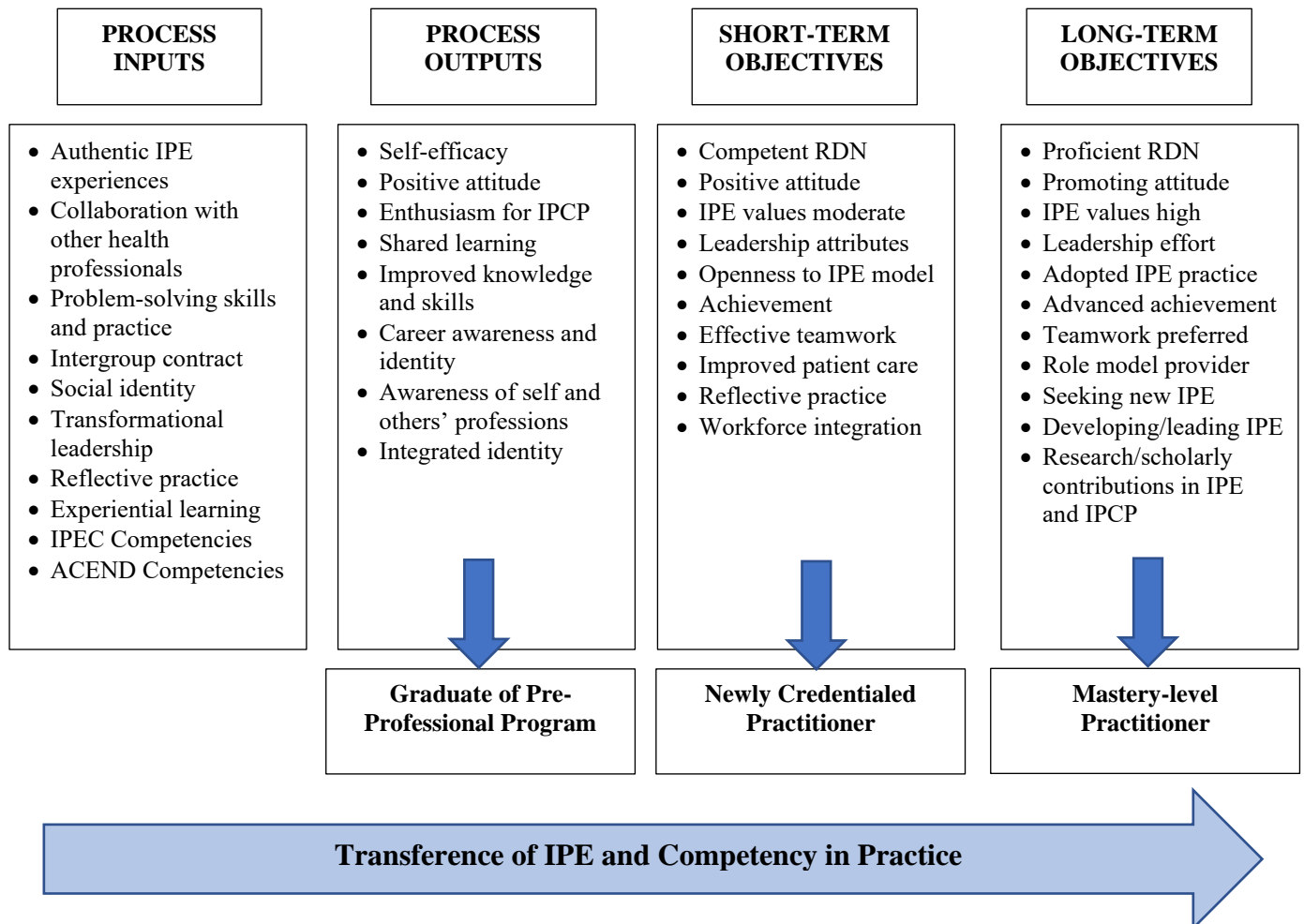
Figure 4 provides a schematic illustration of the conceptual model for this study. The fundamental basis of scientific inquiry is to understand the relationships between theory and practice and to explain outcomes in the context of reasonable applications. In this study, multiple theoretical models were selected to provide a balanced perspective in addressing the research questions. The Kirkpatrick/Barr theory-informed approach was used to evaluate the types of learning activities reported by study participants. The associated levels of learning

provide an overview of current practices in IPE for nutrition and dietetics students. This addresses the first sub-question of how learners' knowledge, skills, and attitudes are assessed in pre-professional programs. Then, three social psychology theories (Intergroup Contact, Social Identity, and Transformational Leadership) support the analysis of entry-level practitioners' perceptions of their values and interactions with interprofessional practice, the relationship between IPE activities and practitioner competence, and the benefits recognized from IPE activities in pre-professional programs. Transformational Leadership Theory was used in the analysis of qualitative data from the narrative comments in practitioner surveys and the program director focus groups. Constructs from adult learning theories (Reflective Practice, Experiential Learning, and Self-Efficacy) provided a greater understanding of practitioners' perceptions and professional benefits as well as the relationship between IPE activities and practitioner self-competency.

In conclusion, this dissertation project integrated many important variables to address what becomes of the IPE efforts during early independent practice. The goals of effective educational concepts and accreditation standards for student performance at the entry-level practice are met at the end of a pre-professional program. The direction of future research is pointed at finding effective, long-term solutions to make the most of learning experiences and resources during training programs. If interprofessional collaborative practice is the ideal measure of quality education, the results of this study will help to inform educators and stakeholders about effective IPE activities and how training programs support the new practitioners in facing real workplace demands. Gingras and colleagues¹²⁷ brought to light "Critical Dietetics," calling to expand traditional educational frameworks beyond conventional thought and practice. The collective and applied theories provide a strong basis for expectations that new RDNs will embrace IPCP and feel well prepared for what they

encounter in the workplace. This assumption was validated by participant responses and then further elucidated through qualitative focus groups.

Figure 4. Conceptual model of IPE transference in RDN practitioners



Chapter 3: Methodology

Project Aims

This project aimed to examine the relationship between various IPE activities used in training pre-professional dietitians that impact self-perceived professional competencies related to IPCP as a new practitioner. The basis of this study was formed at the intersection of educational theories and current practices. Analysis from qualitative and quantitative data was used to reveal essential correlations about the most effective professional outcomes and inform educators within the field of nutrition and dietetics practice about future recommendations.

The specific aims of this project were to 1) determine new practitioners' perceived competence in interprofessional collaboration and practice (IPCP) using a quantitative survey, 2) complete qualitative focus groups with educators that will inform about current methods of student training and assessment for IPE competencies used in pre-professional programs for registered dietitians, and 3) integrate the quantitative and qualitative findings to identify and elucidate gaps in current educational practices and new practitioners' perceptions of their competency to provide recommendations for future steps for educators in nutrition and dietetics profession.

Research Questions

In-depth surveys and interviews were designed to answer the following questions:

1. How do IPE activities during pre-professional programs influence new practitioners' level of competence in IPCP?
 - a. How are learners' knowledge, skills, or attitudes assessed for IPE activities in pre-professional programs?
 - b. How do early-career dietitians perceive their values and interactions related to interprofessional practice?

- c. What is the relationship between types of IPE activities and practitioner competence among early-career dietitians?
 - d. What are the benefits gleaned from IPE provided within pre-professional programs for registered dietitians?
2. What are the gaps in current practice based on the impressions of early-career RDN practitioners?

Hypotheses

1. Pre-professional programs in nutrition and dietetics offer a variety of IPE activities but do not provide a majority within the higher levels of learning which best utilize concepts of transformational learning. (Qualitative)
2. Early-career dietitians have a moderate perception of values and interactions related to interprofessional practice. (Descriptive)
3. There is a significant difference between IPE activities with respect to self-reported practitioner competency within early-career dietitians. (Quantitative)
4. This is a significant association between type of IPE activities and practitioner ratings of preparedness for and willingness to continue. (Quantitative)
5. There are relevant gaps in current practice that can better support the transference of IPE concepts and collaborative-ready RDN practitioners. (Qualitative/Integrative)

Null Hypotheses

1. Pre-professional programs in nutrition and dietetics offer a variety of IPE activities and provide a majority within the higher levels of learning which utilize concepts of transformational learning. (Qualitative)
2. Early-career dietitians do not have a moderate perception of values and interactions related to interprofessional practice. (Descriptive)

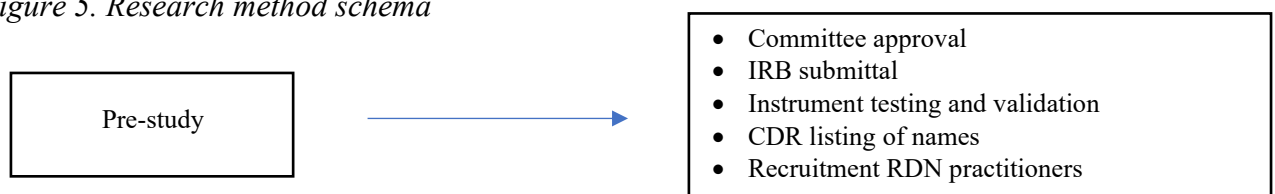
3. There is no significant difference between IPE activities with respect to self-reported practitioner competency within early-career dietitians. (Quantitative)
4. This is no significant association between type of IPE activities and practitioner ratings of preparedness for and willingness to continue. (Quantitative)
5. There are no relevant gaps in current practice that can better support the transference of IPE concepts and collaborative-ready RDN practitioners. (Qualitative/Integrated)

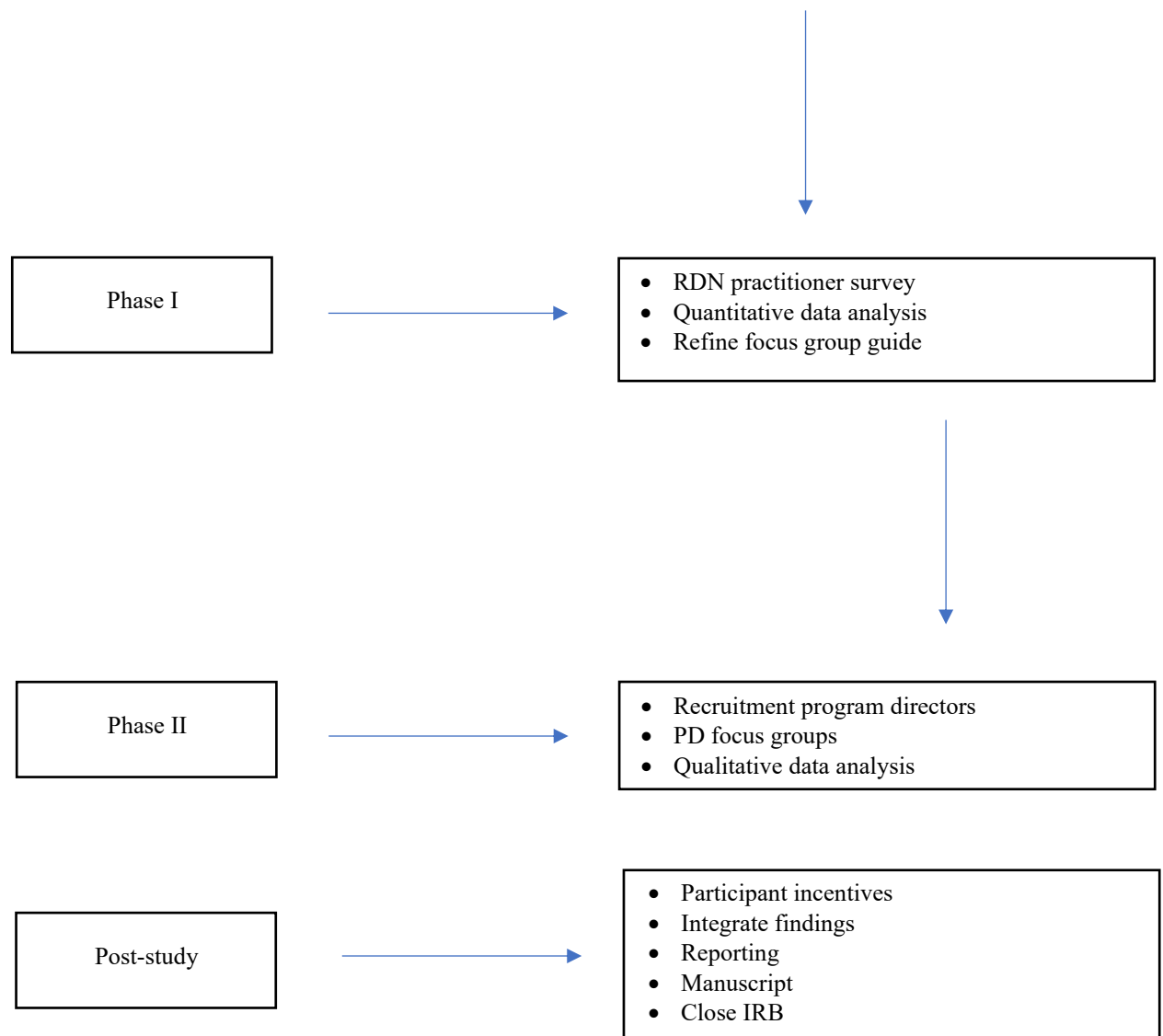
Study Design

Study Overview and Approval

This mixed-methods research used a two-phase design to collect quantitative (survey) and qualitative (focus groups) data about IPE in ACEND-accredited nutrition and dietetics education programs. As displayed in Figure 5, this comprehensive study was exploratory in nature using the theoretical drive of equal-status, and realistically, each research strand could stand independent of the other. The quantitative analysis offered insights on how pre-professional education translates into practitioner competence and helped to shape the interview guide for program directors. In phase two, focus groups with program directors provided elaborative details about the current practices to apply context and illustration of IPE methods.¹²⁸ An interactive design approach was applied to assess the theoretical framework, techniques, and validity of results. Collected variables were analyzed and cross-validated the findings to promote best practices in ND.¹²⁹ This research project was guided and approved by a qualified doctoral dissertation committee. Further, all research protocols and data collection were initiated following approval by the Institutional Review Board (IRB) of the University of North Florida (Appendix A).

Figure 5. Research method schema





Study Participants and Sampling

In phase one, target respondents were newly credentialed RDNs in their early career. This is defined as three years or less according to the 2018 Standard of Practice set forth by the Academy of Nutrition and Dietetics.¹⁸ The original intent was to enlist only those who passed the RDN exam within one year of graduation to keep the measured perceptions fresh in respondents' minds and proximal to the educational program. However, unforeseen limitations in working with the Academy's participant selection process produced the final

sampling to a broad range of RDN practitioners and years in practice. Therefore, respondents were asked to identify their years of experience as an RDN in the questionnaire so that variations in groups could be analyzed.

Eligible participants were recruited from various sources to maximize the survey results. The primary recruitment method used a validated list of 4967 RDN practitioner email addresses obtained with approval from the Research Committee of the Academy of Nutrition and Dietetics. The recruitment email (Appendix B) and electronic survey (Appendix C) were sent to the same distribution list on three separate occasions from January 19, 2022, through February 2, 2022. This information contained the purpose of the study, known risks and benefits of participating in the study, how to contact the researcher, and the IRB approval number. In addition, 612 ACEND program directors were individually contacted by email with a recruitment flyer (Appendix D) to enlist assistance in sharing the information to recent graduates. Additional efforts to reach participants included posting the announcement and recruitment flyer with permission on various AND membership online forums (Sports and Human Performance, Dietitians in Medical Nutrition Therapy, Dietitians in Integrative and Functional Medicine, and Nutrition Educators of Health Professionals) and the Nutrition and Dietetics Educators and Preceptors Academy Group. Personal emails were sent to all known professional contacts within the nutrition and dietetics community, as well as multiple postings occurred on LinkedIn and other social media outlets. A waiver of consent was presented through the electronic survey process, and participants provided their permission to continue electronically. Only completed surveys were included in the data analysis.

Participants in the qualitative phase of the study were directors of ACEND-accredited programs. A stratified, random sampling from a complete roster of ND programs created a target pool of 115 directors (18.8% of the total possible programs) who were then contacted by email to participate. Eligible directors were informed of the study details and invited to

complete an online screening survey (Appendix E). Invitations were sent a total of three times to each candidate during a two-week recruitment period starting March 14, 2022. Returned emails and candidates who chose to opt out were no longer contacted.

The screening survey collected demographic information, meeting time preferences, and informed consent by electronic means. Consented participants were intentionally selected to promote maximum variation in the groups. Considerations included the location, type, and size of the program to mirror the demographics of phase one participants. Selected participants were sent meeting details by email, including a Zoom link, and assigned a fictitious screen name to conceal identities. To manage interactions effectively, focus group size was limited to no more than six people. The natural pattern fell between two and five people in each time slot. Once sessions began, late arrivals were not admitted. Absentees were contacted and offered an alternative time. A predetermined sampling of at least three and as many as five groups was to reach code saturation.^{130–132} Key informant interviews ended when no new information came forth. A total of five focus groups were completed. All participants ($n=13$) were provided with an electronic gift card to Amazon worth \$20 in value.

Study Instruments

In phase one, participants completed an electronic survey (Appendix C) created and securely housed by the REDCap Consortium Software platform.¹³³ Prior to implementation, the quantitative instrument was pilot-tested for validity and reliability. Survey questions related to the IPE activities, aligned with six levels of learning from the Kirkpatrick/Barr Model.^{21,134} In addition to collecting demographic data, the survey measured two key areas of interest. First, continuous variables measured respondents' self-rating of proficiency related to IPCP. Secondly, participants then self-rated various statements in two key domains of interprofessional practice to align with the core competencies of interprofessional

collaborative practice⁶ and an individual's preparedness as a practitioner.³⁷ Specifically, the work of Lockeman and Dow^{93,94} provided a validated 5-point Likert scale of measurement for the outcomes of interest in the domains of: Interprofessional Interaction and Interprofessional Values using the scoring guidelines provided by the authors.

As previously noted, target program directors completed an online screening survey (Appendix E) to collect demographic variables, meeting preferences, and electronic consent. This allowed the researcher to organize focus group assignments and optimize the balance of program representation. A semi-structured interview guide (Appendix F) was developed from the literature review to address two primary research questions: 1) how are learners' knowledge, skills, and attitudes assessed in pre-professional programs, and 2) what are the gaps in current practice based on the impressions of early-career RDN practitioners? Results from the quantitative survey in phase one, along with feedback from subject matter experts and the dissertation committee, informed the final revisions of the qualitative instrument.

Data Collection

Once approval from the Institutional Review Board of the University of North Florida was obtained, quantitative data collection took place for six weeks, from January 19 and February 23, 2022. Survey response rates were monitored throughout the process, and three email reminders were sent to the primary RDN research listing to encourage participation. Several postings in professional online forums and recruitment emails to professional contacts also enhanced participation rates. Once phase one reached the predetermined date, the electronic survey was closed.

Recruitment activities for phase two began on March 1, 2022. Completed respondent screeners were processed daily to identify representatives and ensure maximum participation to fill a target sample size of 20, which was calculated for data saturation.^{131,132} Focus groups

were conducted using the Zoom virtual platform and software between March 14 and April 7, 2022. This format¹³⁰ was chosen to maximize the effectiveness and include a wide variety of representatives. A virtual setting allowed participants to see and interact with each other in real-time.¹³⁰ As participants entered the virtual session, actual identities were protected using private breakout rooms. Each participant was provided with standard instructions about confidentiality and provided with a fictitious identity for use during the sessions. Sessions were timed so as not to exceed 90 minutes; most were completed within 75 minutes, and session times ranged from 62 to 85. The audio and text transcripts of all sessions were recorded for analysis. The researcher also wrote personal notes during all sessions along with the structured-interview guide to assist in qualitative analysis.

At all times, in accordance with the approved research protocols, data collected were secured with the research team via electronic secure login credentials and passwords. Survey (deidentified) and participant screening data are housed in the REDCap system under secure login and downloaded for processing into Excel files, which are also secured on One Drive in the researcher's private account. Audiovisual recordings were downloaded and stored in Microsoft OneDrive, again under password protection. Field notes and printed transcripts from the focus group sessions were secured in the personal files of the researcher.

Data Analysis

This study used an explanatory sequence design. Such analysis involves two phases 1) an initial quantitative instrument phase, followed by 2) a qualitative data collection phase in which the qualitative phase builds directly on the results from the quantitative phase. In this way, the quantitative results are explained in more detail through qualitative data. In addition to several demographic and descriptive characteristics, the outcomes of interest collected in this study aimed to answer stated research questions. Table 5 depicts the data variables

aligned with a theoretical basis for the predictor, specific measures, type of variable, and the analysis testing performed. Due to the biphasic research design, the analysis took place at the end of each data collection step, and the results were compiled and correlated in the formal reporting of the project. Details are further described in the subsequent sections.

Table 5. Statistical methods for research objectives

Research Questions	Construct or Predictor	Measure	Variable Type	Analysis Test
1. How do IPE activities during pre-professional programs influence new practitioners' level of competencies in IPCP?				
a. How are learners' knowledge, skills, or attitudes assessed for IPE activities?	Kirkpatrick/Barr Levels of Learning Experiential Learning Theory	Types of IPE Activities	Qualitative Attributes	Coding Thematic Analysis
b. How do entry-level dietitians perceive their values and interactions related to interprofessional practice?	Social Identity Theory Self-Efficacy Theory	Likert Scale Self-rating of Team Values and Interactions	Ordinal	Descriptive Statistics
c. What is the relationship between types of IPE activities and practitioner competence within the early-career of dietitians?	Intergroup Contact Theory Self-Efficacy Theory Experiential Learning	IV = Activity Type DV = Self-rating of Competency	Nominal Ordinal	Mann Whitney U
d. What are the benefits gleaned from IPE activities provided in pre-professional training programs?	Intergroup Contact Theory Reflective Practice Theory	IV = Activity Type DV = Self-rating of future plans	Nominal Ordinal	Mann Whitney U
2. What are the gaps in current practice based on the impressions of early-career RDN practitioners?				
	Transformational Leadership Theory Experiential Learning Theory	Integrated data from quantitative and qualitative	Qualitative	Statistics, Thematic Analysis

Practitioner Survey Phase I

The primary survey was distributed to 4967 RDN practitioners, and an unknown number of secondary practitioners received the survey information to enhance participation. Therefore, the number from the primary mailing was used to compute the overall response

rate. A total of 463 surveys were returned (9% response rate). In preparing for analysis, all missing data were inspected. The missing data accounted for no more than 5% of the total data and was found to occur randomly. Cases with incomplete survey items (164 cases) were omitted, resulting in a final sample size of 299 respondents (6% response rate). This number was further reduced to only respondents who identified practice years to be four or less as the primary target population for this study, $n=103$. This reduced the statistical power due to a smaller sample size, however, this still allowed for unbiased observed data.^{135–138} IBM SPSS Statistics Software (SPSS) for Windows, Version 28, Chicago, IL: SPSS Inc. was used to analyze data.¹³⁹ Descriptive characteristics of the sample were computed, and the data set was found to be non-parametric with a negatively skewed distribution.

The RDN practitioner survey collected various attribute data such as age, gender identity, years in practice, settings of primary practice, and type of organization, the type of pre-professional program, and location of the program by state. A few survey questions also prompted respondents to provide open narrative comments that were collated and analyzed in the secondary analysis. This facilitated the analysis to address the first investigational aim of the study about new practitioners' perceived values and interactions about interprofessional practice. A specific question on the survey asks participants to categorize their current level of competence (novice, advanced beginner, competent, and expert) related to IPCP using the Dreyfus Model adopted by the Academy of Nutrition and Dietetics.¹⁸

Survey respondents identified the types of IPE activities performed during their pre-professional education through checkbox-selection of items on the questionnaire or provided "other" qualitative comments in an open text box. The data were independently coded by the researcher and a volunteer faculty member into levels of learning using the Kirkpatrick/Barr system⁷⁵ for research question 1a. Qualitative data from phase two were later integrated into this process during the final analysis to ensure a complete listing of student assessments.

Research question 1b, how entry-level dietitians perceive their values and interactions related to IPCP, was measured via a Likert scale of 1-5 (1 = strongly disagree, 3 = neutral, and 5 = strongly agree). Respondents were asked to self-rate their level of agreement with fifteen statements on IPE team values and interactions based on the published and validated work of Lockeman and Dow.⁹⁴ For the final analysis, case responses with 1-2 were coded as low self-perception of competence in IP team values and interaction; responses 3-4 were coded as moderate, and a reaction of 5 was coded as high.

To address research question 1c about relationships between IPE activities (independent variable, or IV; categorical, specifically nominal, data) and dietitians' self-rating of IPCP competency (dependent variable, or DV; ordinal data), a Mann-Whitney U was used to compare two groups (chose/did not choose) for each IPE activity on a ranked DV. An α of .05 was used to determine statistical significance.

Research question 1d gathered the impression of early-career dietitians about the benefits of IPE activities related to two final questions on the same Likert-scale ratings. "My pre-professional education effectively prepared me for interprofessional collaborative practice," and "I will continue to seek out experiences in interprofessional education as an RDN." To answer the question if IPE activities (IV; nominal data) created perceived long-term benefits (DV; ordinal data) for practitioners, a Mann-Whitney U test compared two groups (chose/did not choose) for each IPE activity on a ranked DV. An α of .05 was used to determine statistical significance, and the effect size was calculated.

Focus Groups with Program Directors Phase 2

Audio recordings from five focus groups were converted by the Zoom software into word-for-word transcription, converted to Word, and cleaned for misspellings and erroneous artifacts. All session transcripts were read completely to gain an overall sense of information

flow and general organization of the data. From participant responses, the types of IPE activities used in student assessment of IP competency were coded by the principal investigator using six levels of learning on the Kirkpatrick/Barr scale²¹ to answer research question one. A second reader, who is a volunteer faculty member, independently coded the activities. When needed, a third reviewer was consulted to address discrepancies so that a consensus was reached for each unique activity.

For the second aim of this study, to address gaps in current practice, transcribed data were hand-coded by the principal researcher using a deductive approach to identify central themes. Initial open coding identified key labels such as assessment methods, IPE activities, promoters, limiters, barriers, work with other professions, and opportunities in educational processes. Segmented data were marked for the development of the research codebook. This promoted further decisions about how the data were connected to themes. Memoing by the researcher during the interview process captured other analytical data and specific points of significance, such as innovative ideas and recommendations.

Since the experience and background of the researcher may contain biases, values, and ideologies that can affect when the data is saturated, it is important to mitigate any concerns during data collection process. The trustworthiness of the qualitative data analysis was enhanced with a second reviewer. After the principal investigator completed the coding for all transcripts, a volunteer faculty member did the same to address any discrepancies or missed elements by consensus. Finally, pooling all the data together, the integrated findings from both phases provided insights and implications for future practice.

Chapter 4 Results

For this biphasic mixed methods study, results are reported in the sequence of data analysis. Overall, the data provided a unique and meaningful basis for discussion with some

significant findings. In addition, each component of the study produced sufficient sampling and participant characteristics consistent with the research aims.

Sample Characteristics

For the quantitative portion, the analysis sample of 103 completed surveys ($n=93$ females or 93.2%; 5 males or 4.9%; 1 part-time in both genders; 1 no answer) were active RDN practitioners who indicated four or less years in practice, which demarked early-career as the primary audience. The mean participant age was 28.83 ($SD=7.4$) years and ranged from 23 to 59. The mean years in practice was 2 ($SD=1.13$). Table 6 displays the types of pre-professional programs found in this sample. Pre-professional training occurred in 31 of the 54 states and territories in which ACEND-accredited programs operate; the three most frequent results were Illinois ($n=17$), Florida ($n=11$), and Pennsylvania ($n=10$). The remaining 28 location responses fell between 1 and 8 observations. No foreign programs were represented in this sample. Table 7 displays the practice settings captured in this sample. The most frequent primary practice setting was identified as acute care inpatient ($n=39$; 38%), followed by outpatient program ($n=26$; 25%), and when combined comprised a majority (63%) of the sample. Observations of other practice settings occurred much less often. The majority (68%) indicated that they had dedicated workspace and time to promote interprofessional collaboration.

Regarding practitioner affinity for IPCP reported in the survey, a wide range of responses were noted to the question, “In your current work setting, on average, how many interprofessional rounds or activities do you attend per month?” Participant responses ranged from 0 to 72 ($M=9.06$, $SD=13.17$) and displayed a non-parametric distribution pattern, heavily skewed to the right. The most frequent observation was 0 ($n=24$), followed by 1 or 2 ($n=10$), 20 ($n=10$), 4 ($n=9$), and 5 ($n=8$). A majority (63.1%) of participants self-identified as

“novice” or “advanced beginner” related to interprofessional collaborative practice, and 35% ($n=36$) self-identified as “proficient” while only 1.9% ($n=2$) chose “expert.”

Table 6. Pre-professional pathways of survey participants ($n=103$)

Which type of pathway did you complete to qualify for the CDR registration exam for dietitians?			
Program Type	Frequency	Percent	Cumulative Percent
Coordinated Program (CP)	20	19.4	19.4
Future Graduate Program (GP)	3	2.9	22.3
Didactic Program in Dietetics (DPD) + Dietetic Internship (DI)	75	72.8	95.1
Individualized Supervised Practice Program (ISSP) + other qualifying degree or educational program	4	3.9	99.0
Other not listed	1	1.0	100.0
Total	103	100.0	

Table 7. Current practice settings of survey participants ($n=103$)

Which of the following best describes your current primary practice setting?			
Practice Setting	Frequency	Percent	Cumulative Percent
Acute care inpatient	39	37.9	37.9
Outpatient program	26	25.2	63.1
Long-term care/rehab	8	7.8	70.9
Public health	8	7.8	78.6
School nutrition	2	1.9	80.6
Government	1	1.0	81.6
Higher education	2	1.9	83.5
Private practice or consulting	7	6.8	90.3
Sales and marketing	1	1.0	91.3
Media and communications	1	1.0	92.2
Food service operations	3	2.9	95.1
Other not listed	5	4.9	100
Total	103	100	

For the qualitative phase with key informants, a total of 13 ACEND program directors participated and represented the following ND programs: Future Graduate Program ($n=5$), Dietetic Internship ($n=5$) and Coordinated Program ($n=3$). Geographical representation was

from Arizona, California, Florida, Idaho, Illinois, Michigan, Missouri, New Jersey, New York, Ohio, Pennsylvania ($n=2$), and Virginia. All participants were female and had been in the program director's position for at least six months, but the majority ($n=11$) of participants indicated their service as a director was greater than 18 months. Total experience in nutrition and dietetics education ranged from 7 to 40 ($M=19.2$) years.

Analyses to Address Research Hypotheses

Hypothesis 1. Pre-professional programs in nutrition and dietetics offer a variety of IPE activities but do not provide a majority within the higher levels of learning which best utilize concepts of transformational learning. (Mixed methods)

Respondent data from the RDN practitioner survey determined several types of IPE learning activities were offered in pre-professional programs. Table 8 illustrates the full array of activities reported in the electronic survey along with the categorical assignment from the level of learning as defined by Kirkpatrick/Barr⁷⁵ and coded through qualitative analysis. A slight majority (50.8%) fell at the lower levels 1a, 2a, or 2b. Eight (8) responses (1.7%) identified other IPE learning activities as "other" or "none of the above." Activities in this level reflect student reactions, modification of attitudes/perceptions, or the acquisition of new skills. Level 3 encompasses the assessment of a behavior change. Twenty-seven percent (27%) were reported at this level (interactive lab, practicum experience, and volunteer role). Level 4 activities that change organizational behavior or extend benefits to patients/clients were reported at 22.2% (simulation, health fair, and community outreach).

Table 8 IPE Learning experiences reported in survey ($n=103$)

"During your pre-professional education program, which of the following interprofessional activities did you experience? (Check all that apply)"				
Learning Experience	N	Percent Reported	Percent of Cases	Kirkpatrick/Barr ⁷⁵ Level of Learning Applied
Independent assignments	69	15.1	67.0	1a, 2a

Online case study	61	13.4	59.2	2b
Shared lecture	57	12.5	55.3	2b
Embedded coursework	37	8.1	35.9	2b
Interactive lab	34	7.5	33.0	3
Simulation case with team	45	9.9	43.7	4a
Practicum experience	48	10.5	46.6	3
Volunteer role	41	9.0	39.8	3
Health fair or screening event	26	5.7	25.2	4b
Community outreach program	30	6.6	29.1	4b
None of the above	5	1.1	4.9	-
Other	3	0.6	2.9	-

a. Dichotomy group tabulated at value 1.

Focus group participants identified similar learning activities used to assess IPE performance competencies. Responses were coded in the same manner and matched with the results from the quantitative survey, generating four new types of IPE activities. Table 9 displays the overall results.

Table 9 IPE Learning activities reported in focus groups

“What IPE activities do you perform in your program?”		
Learning Experience	Appeared in Quantitative Survey?	Kirkpatrick/Barr ⁷⁵ Level of Learning Applied
Independent assignments	Yes	1a, 2a
Online case study	Yes	2b
Video recordings	No	2a, 2b
Readings	No	2b
Embedded coursework	Yes	2b
Interactive lab	Yes	3
Simulation case with team	Yes	4a
Practicum experience	Yes	3
IPE annual event	No	2b
IPE clinics or care conferences	No	3, 4a

Out of the 10 IPE experiences reported, 6 (60%) student learning outcomes were measured at the lower level of 1a, 2a, or 2b (assignments, online cases, videos, readings, coursework, and annual event). The remaining items (interactive lab, simulation case, practicums, and IPE clinics or care conferences) comprised 40% of the responses measured at

higher levels focused on outcomes of behavior change, change in organizational practice, or benefits to patients/clients.

Overall, the data confirmed the hypothesis by integrating the results of both phases. There is a variety of IPE learning experiences offered in pre-professional programs. As many as 14 different activities were identified, which could be higher since some types were reported as “none of the above” or “other.” Further, most activities are offered at the lower levels of IPE learning which do not fully promote the theoretical tenants of transformational learning, which would enhance the transference of interprofessional team values and interactions. One key finding in the survey data is that RDN practitioners highly rated these activities (Likert scale) in response to the question, “Regarding the interprofessional activities you checked in the previous question, please rate on the scale of 0-9 how important these activities (overall) were for your professional development, where 0 = not important at all to my professional development.” Table 10 displays the frequency results by ratings applied as 0-2 = not important, 3-5 = somewhat important, 6-7 = important, and 8-9 = very important. A large majority (n=76; 74%), shown in the shaded areas, indicated IPE activities in pre-professional programs were important or very important to their professional development. While most activities in ND programs are delivered at lower levels of learning, early-career dietitians strongly relate to the transformational benefits of all experiences in applying professional competencies in the workplace. The results here validate that IPE activities are meaningful endeavors in training collaborative-ready practitioners.

Table 10 Frequencies and interpretation of IPE activities (n=103)

Interpretation	Rating	Frequency	Percent	Cumulative Percent
Not Important	0	4	3.9	3.9

	1	2	1.9	5.8
	2	5	4.9	10.7
Somewhat Important	3	5	4.9	15.5
	4	2	1.9	17.5
	5	9	8.7	26.2
Important	6	15	14.6	40.8
	7	21	20.4	61.2
Very Important	8	23	22.3	83.5
	9	17	16.5	100.0
Total		103	100.0	

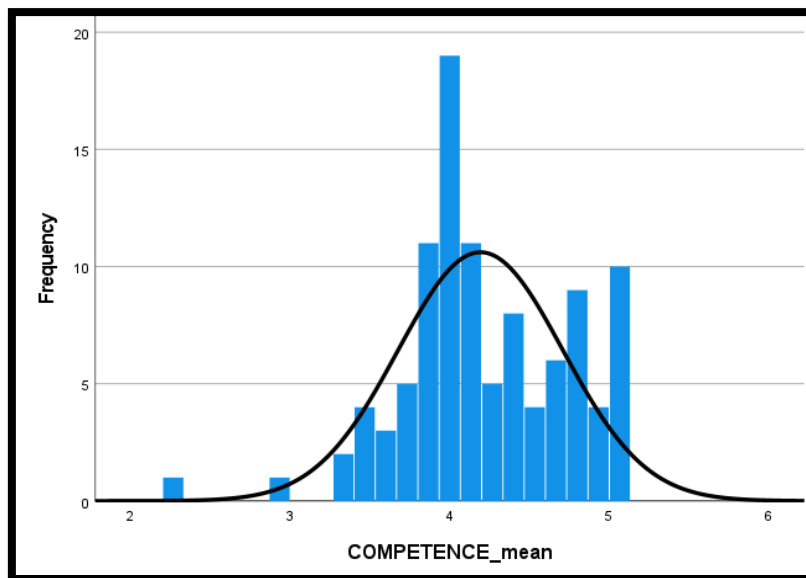
Hypothesis 2. Early-career dietitians have a moderate perception of values and interactions related to interprofessional practice. (Quantitative)

Self-assessment of interprofessional competence was important to understanding how early-career dietitians benefitted from IPE. Thus, survey participants were first asked to classify themselves in response to this item, “How would you describe your current level of competence related to interprofessional collaborative practice?” Sixty-three percent (63%) identified at the entry-level of practice (Novice or Advanced Beginner), as defined by the Academy.¹⁸ Interestingly, only 35% identified at the Proficient level, and 2% identified as Expert. This variable was then used to further analyze relationships with IPE activities.

For self-reported “competence” related to interprofessional practice (Likert scale where 1 = strongly disagree and 5 = strongly agree), the mean score was 4.19 ($SD=.516$; range = 3 with scores ranging from 2-5), with higher scores indicating higher self-reported competence. Figure 6 displays the frequency distribution of all responses in the survey sample. Ordinal response variables were collapsed into three levels: 1-2 as low, 3-4 as moderate, and 5 as high. Results indicated this sample with less than 5 years in practice has a ‘moderate’ perception of their own competence as it relates to “interaction” (e.g., “I am able to use available evidence to inform effective teamwork and team-based practices”) and

“values” (e.g., I am able to respect the cultures and values of other health professions”). The hypothesis is confirmed.

Figure 6 Frequency distribution of IPCP competence



Hypothesis 3. There is a significant difference between IPE activities with respect to self-reported practitioner competency within early-career dietitians. (Quantitative)

Regarding the postulate that there will be significant correlations between IPE activities (dichotomous data) and self-reported practitioner competency (Likert Scale) among early-career dietitians, a Mann-Whitney U test was computed as a non-parametric alternative to independent samples t-test. This test compared two groups (chose/did not choose) on a ranked DV, in this case, self-reported competency. No statistically significant associations were found between any of the IPE activities chosen and scores on the competence scale. Therefore, the null hypothesis is confirmed.

Hypothesis 4. There is a significant association between type of IPE activities and practitioner ratings of preparedness for and willingness to continue. (Quantitative)

Statistical testing for this hypothesis was completed using a Mann-Whitney U test. This test is useful for comparing two groups when parametric assumptions cannot be met as an alternative to the independent samples t-test.¹³⁹ Testing compared two groups (those who experienced the IPE activity during pre-professional education versus those who did not) on the ranked DV via two unique items from the practitioner survey using Likert scale ratings or ordinal data of self-rated competence (1-5, 1 being strongly disagree and 5 being strongly agree) to evaluate a perceived benefit (preparedness and willingness) from IPE activities. The first item evaluated how effectively pre-professional programs prepared students for IPCP, and the next item evaluated practitioner willingness to continue seeking IPE, which relates to the theoretical constructs around transformational learning and behavioral change. Results for each survey item are discussed separately.

Table 11 presents results of statistical testing for each IPE learning activity to compare two groups (chose/did not choose) on the ranked DV (Likert item, ordinal data). There were five significant findings. The first DV as “My pre-professional education program effectively prepared me for interprofessional collaborative practice” indicated that competence scores had the greatest level of significance for those who experienced “simulation case with team” as an IPE activity during their pre-professional education program ($Mdn = 4.00, n=103$) compared to those who did not ($Mdn = 3.00, n=103$), $U = 810.0, z = -3.646, p < .001$, with a medium effect size, $r = .34$. Likewise, competence scores were significantly greater for those who experienced “embedded coursework” ($Mdn = 4.00, n=103$) compared to those who did not ($Mdn = 3.00, n=103$), $U = 778.5, z = -3.201, p = .001$, with a medium effect size, $r = .32$. Significant differences in competence scores were also found for those who experienced “interactive lab” ($Mdn = 4.00, n=103$) compared to those who did not ($Mdn = 4.00, n=103$), $U = 791, z = -2.819, p = .005$, with a small effect size, $r = .28$, those who experienced “practicum experience” ($Mdn = 4.00, n=103$) compared to those

who did not ($Mdn = 4.00, n=103$), $U = 918.5, z = -2.212, p = .027$, with a small effect size, $r = .21$, and “independent assignments” ($Mdn = 4.00, n=103$) compared to those who did not ($Mdn = 3.50, n=103$), $U = 918.5, z = -1.985, p = .047$, with a small effect size, $r = .20$.

Table 11 Mann-Whitney U results for effectively prepared for IPCP

Variable	P-value (sig.)	Correlation Value (r)
Independent assignments	.047*	.20
Online case study	.064	.18
Shared lecture	.097	.16
Embedded coursework	.001**	.32
Interactive lab	.005*	.28
Simulation case with team	< .001**	.34
Practicum experience	.027*	.21
Community outreach program	.080	.17
Volunteer role	.105	.16
Health fair or screening event	.777	.03

* $p < .05$ ** $p < .01$

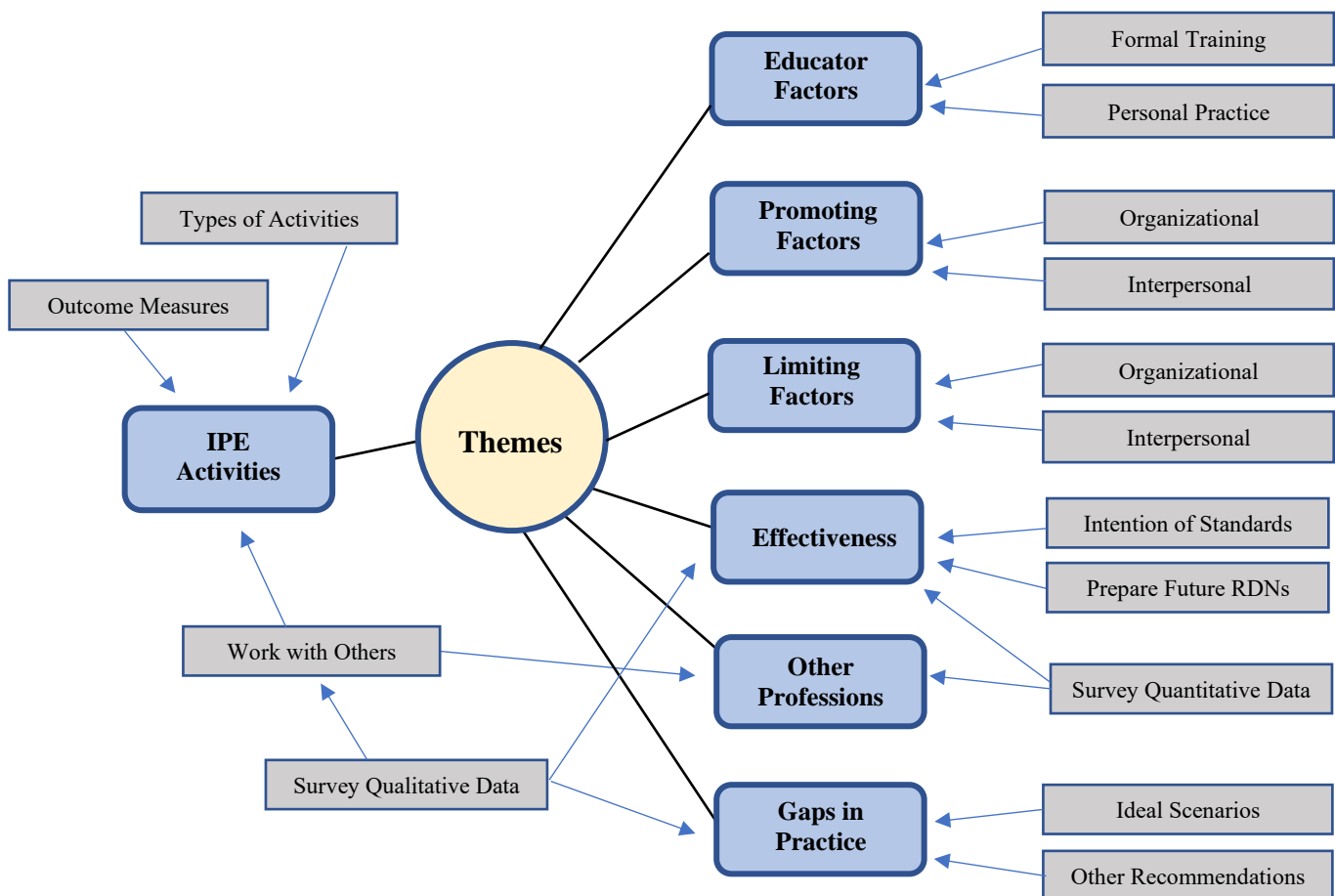
The next survey item evaluated related to how practitioners rated the statement “I will continue to seek out experiences in interprofessional education as an RDN” as the DV. This was established as a benefit of IPE in that early practitioners see the importance of collaborative practice. A Mann-Whitney U test was performed using Likert-scale ratings or ordinal data (1-5, 1 being strongly disagree and 5 being strongly agree) as the IV. Again, this test compared two groups (chose/did not choose) on the ranked DV. None of the IPE activity choices were statistically significantly associated with the DV in this case.

Hypothesis 5. There are relevant gaps in current practice that can better support the transference of IPE concepts and collaborative-ready RDN practitioners. (Mixed methods/Integrated).

Results from five focus groups and 13 key informants (5 GP: Future Graduate Programs, 5 DI: Dietetic Internships, and 3 CP: Coordinated Programs) were hand-coded and organized into seven unique themes as displayed in Figure 7 using a deductive approach. An

interview guide provided pre-determined codes based on the research questions. During the analysis, no new codes or themes emerged. Data related specifically to IPE activities are reported under Hypothesis 1. Six remaining themes related to the overall effectiveness of current practice are further analyzed, adding quantitative survey findings when applicable.

Figure 7 Thematic analysis



Educator Factors

It was postulated that educators who are prone to IPCP would actively promote IPE activities in their programs more frequently, at higher levels of learning, and as role models in the ND profession. Moreover, a key attribute of effective IPE is related to the training and education of the educators who are tasked with carrying out the mission within programs.

This theme evaluated results related to formal preparation and personal practice of educators. Quoted statements are displayed in Table 16a for a more complete illustration of the themes.

In every focus group, many participants reported that they had little to no formal training as an educator to prepare or deliver IPE activities. The most common example offered for acquiring training and skills in this area was “facilitator training” prior to an event. The next method of training most cited was through the natural work of an IP committee operating in the program setting. Interestingly, none of the participants who reported this method served in the leadership role of the IP committee. Other professions such as nursing, medicine, and health administration were identified in the key accountable position of the group. These initiatives were often driven by accreditation standards. The next most frequent sub-theme around educator training was workshops provided by the Academy of Nutrition and Dietetics, state affiliates, or practice groups of the Academy. Other responses indicated that participants must depend on their own initiative to seek out IPE training, such as reading articles or attending webinars. A few participants reported that they are “trained by doing” and bring their own skills to the IPE experience. 50% of the respondents added that IPE is often a “lived experience” and that the skills of continuous quality practice as an RDN, such as management experience or active participation in patient care, promote the sufficient development of IPE training skills for educators.

Related to the ways participants personally practiced the concepts of IPCP, the results were more varied and individual. The most frequent sub-theme in this area was the role as a program director. Several participants cited those additional duties and responsibilities that brought them into contact with other professions and organizational experiences that added to their skill sets, different from their primary role as educators. Another common observation was the work of grant or scholarly activities that, by their nature, required collaboration and leverage of other professions on a team. The creation of instructional content and innovative

learning activities for students also appeared a few times as examples of personal practice. The process of self-learning and discovery promoted this finding. Finally, three participants described their personal work in IP by achieving a terminal degree in education or advanced practice, which promoted the use of a “different lens” to envision how the role of dietitians could be more effectively integrated into complex organizations.

Promoting Factors

Many external or organizational factors promoted IPE within the representative programs. These also varied between program type and organizational setting. Accreditation standards tend to drive the attention placed on IPE within programs. The most frequent observation reported in this sub-theme was the presence of a formal structure that emphasized collaborative practice. In larger settings, this also was noted to occur with dedicated physical space, a “top-down champion,” and financial resources such as shared costs, integrated software, annual events, and funded positions to coordinate IPE. Grant activities, particularly the active funding or recent experience with a dedicated award, were cited in three groups, representing common or emerging trends in the field. Again, like it was reported in educator factors, the existence of an IPE committee with a dedicated leader was a key factor in this theme across all groups.

Interpersonal factors also played a role in promoting IPE within the qualitative sample. The most frequent response was the use of “creative flexibility in applying the standards” and the “timely issue” of training students in IPCP. Several respondents commented on the Academy’s recent efforts to promote collaborative practice and agreed that IPE was the best option to achieve this. One respondent noted that “IPE activities hit a bunch of the standards at the same time,” while another respondent offered that “other professions are asking for us.” There was also another common observation in this sub-theme related to

the culture and openness of other professions to include RDNs in the ongoing programs and efforts to enhance IPE in various settings. In some cases, other professions or cultures were described as operating in a silo orientation. There was consensus in the data that interpersonal factors are closely associated with the perceived level of engagement, professional credibility, and value offered by dietitians on the team, and those attributes are directly influenced, potentially in both directions, by those individual RDN practitioners who get involved in IPCP. This finding ties back to educator factors as well as limiting factors. Quoted statements are displayed in Table 16b for more complete illustration of the themes.

Limiting Factors

Inherent to effective operations, dedicated resources are essential to the success of all priority goals of ND programs. Organizational factors are discussed first. Funding for IPE was reported most often as a limiting factor. This observation occurred in all five groups. Conversely, it was also reported as a promoter with unique examples of how individual organizations overcame fiscal challenges. In the data, sub-themes were noted frequently related to lack of funding for outside initiatives, limited space in the current settings, and faculty workloads arranged to offer IPE as volunteer activities and were not compensated with overloads for the additional time and effort. The sub-theme of operational “silos” was also reported frequently in this area, citing examples of how accreditation standards create profession-specific objectives and the natural hierarchy of dietitians within the health care teams. Similarly, the size of ND programs often limited the funding generated by the programs, the number of ND students available to participate, and the availability of faculty for ND programs to participate in broader organizational initiatives.

In many organizations, there are still barriers between colleges or departments that bring in interpersonal factors. In one program, a DI director reported they were the only

health professions program in the organization, and this created significant barriers in the ability of the interns to share in joint training or patient care activities with other students, which is a foundational tenant of effective IPE. This was echoed in comments from GP and CP directors related to variability from site to site with preceptors and services provided at practicum sites. Despite efforts to train and support preceptors, it was difficult to control the quality of the IP experiences outside of the program's direct influence. Data from three groups highlighted the sub-theme that IPE created a significant demand for personal time. Scheduling was frequently reported as a factor in managing personnel and students. Finally, as conversely reported in Promoting Factors, an organizational culture where RDNs are not valued created significant barriers and reduced the motivation of faculty to generate expansive activities. In these cases, individuals commented that "nutrition was an afterthought." Quoted statements are displayed in Table 16c for a more complete illustration of the themes.

Effectiveness

Three groups of data provided the analysis results under the theme of Effectiveness. First, quantitative results ($n=103$) are reported in Table 12 related to early-career dietitians' perception of the emphasis of IPE in the curriculum of their respective programs. This was evaluated to gain insight into what lasting impressions graduates may have about the IPE experiences during pre-professional training. Survey participants were asked to select ratings from predetermined categories. At least 60% ($n=62$) reported "moderate" or "foundational." Only 6.8% ($n=7$) saw this as "none at all" while 33% ($n=34$) rated IPE as a "minimal" emphasis. Therefore, 95% of this sample recognized IPE activities in their education, but more importantly, most of the respondents considered a moderate to strong emphasis on IPE

in their programs' curriculums; the majority ($n=48$) saw the IPE efforts in pre-professional programs as moderate.

Table 12 Reported emphasis of IPE in curriculum ($n=103$)

“Thinking about your pre-professional education program, how would you describe the emphasis of interprofessional learning activities in the curriculum?”			
Participant Response		Frequency	Percent
None at all		7	6.8
Minimal, such as lectures only		34	33.0
Moderate, with occasional interactive activities		48	46.6
Foundational, main theme throughout program		14	13.6
Total		103	100.0

Focus group participants were presented with formal definitions of interprofessional practice and IPE along with current ACEND standards related to interprofessional practice as part of the facilitated discussions. Qualitative responses to discussion prompts were analyzed into two sub-themes: how effectively do programs meet the intention of standards and which activities best prepare future RDN practitioners. Quoted statements are displayed in Table 16d for a complete illustration of the data.

There was disagreement between the groups related to how well programs perform in meeting the standards. Overall, all participants confirmed that programs are meeting the minimal intent of the IP standards. For example, one DI director reported that “we just had our site visit, and they said we were meeting the standard.” Most responses confirmed “yes” to meeting the standard. One person mentioned, “we are meeting them pretty well, but there is always room for improvement.” Variations were noted in the type of activities, experiences with preceptors, and interpretation of the standards. For example, one GP director mentioned, “the vagueness of the standard gives us a lot of flexibility, and at the same time, I’d like more guidelines on how to do this.” Another comment was related to IPE as “coming into it

backwards” and mentioned that more “intentional activities would be beneficial.” One respondent was “not sure” about the effectiveness of IPE in a GP program.

Regarding the most effective activities to prepare future RDN practitioners, there was marked consensus in the data and sub-themes. Activities reported as the best opportunities to train students in and create authentic learning activities around IPCP involved “interacting and seeing another perspective” or “having experiences as a team.” Creating IP experiences for students centered around patient care was reported in all groups. One director of a CP program described these activities as “building confidence in advocating for nutrition.” Other examples were shadowing other professionals, grand rounds or case presentations, mock simulations with standardized patients and several disciplines, and staff relief. It was a common theme that all students participating in the activity should have the same experience. Ideal activities should promote the “development of critical thinking.” Virtual platforms were mentioned in one focus group by two of the participants, making use of benefits from recent programming changes to accommodate activities in the COVID pandemic. Another participant mentioned, “it’s hard for students who have not had any work experience to relate to interprofessional teams.” Therefore, the implication is noted that pre-professional programs must provide learning activities to best equip students with real-world experiences and meet entry-level competency. One CP director offered a unique example in food systems management as a non-traditional idea of implementing IPE since the training skillset involves teamwork, collaborative practice, and other professionals. Specifically, a pureed foods lab to teach ND students about the International Dysphagia Diet and Standardization Initiative¹⁴⁰ included several other health professions and was a top-performing activity in the program.

Survey participants were prompted to add optional narrative comments about the value of these activities to current practice to gain the RDN practitioner perspective. The item stated, “Describe a few lines about the value of these activities to your practice.” Fifty-four

complete responses were captured into a Word document, initially categorized into comments with favorable impressions ($n=45$) or negative impressions ($n=9$), and further analyzed by hand-coding using the established research code book. The highest number of comments related to the value of IPE ($n=25$), followed by effectiveness ($n=21$), and then limiters ($n=9$). Representative samples of direct quotes and coding themes are displayed in Table 13.

Overwhelmingly, the data point to a highly valued impact of IPE in early-career practitioners. Segmented data for this analysis resulted in 68 unique codes. When left to openly address the interpretation of “value,” respondents provided 46 (67.6%) comments under the themes of value or effectiveness and only nine codes (13%) under the theme of limiters. The data also provided for additional information about other health professions ($n=8$) encountered during IPE activities as a student. Only one (certified nursing assistant) was unknown and therefore included in the full analysis. No new activities or assessments were uncovered in this sample, but they further emphasized the value of including interns and students in the live team activities, such as clinical team rounds, during pre-professional training. Finally, there were two unique comments about gaps in practice. One indicated the recommendation to include more “simulation and interactive labs,” and the other indicated more skills in working with teams and understanding roles, the key objectives of IPE, and collaborative practice.

Overlayed with the quantitative results about how early-career RDNs perceive their pre-professional program in terms of preparing for current practice tested for Hypothesis 3, the qualitative data in the survey affirmed those results. The most effective IPE activities are the ones that provide authentic interactions with multiple and diverse health professions. Further, students most appreciate the understanding and reflecting on the value of the RDN and being accepted as key members of health care teams. The narrative survey comments about the perceived value of IPE further enhance the information gleaned from the quantitative survey data and the focus group qualitative data. Overall, this survey question

triangulated the process of IPE education with entry-level practice competencies and transference into current RDN practice.

Table 13 Narrative survey responses about IPE value

“Describe a few lines about the value of these activities to your practice.”	
Qualitative Code/Sub-themes	Sample Qualitative Responses
Value (25)	“I learned how my work nicely fit with other professions.”
Needed for work (2)	“We got to see how all of the teams work together and their roles on an interdisciplinary team.”
Helpful/important (4)	“I learned how to advocate for my role, as well as how to work with others for the best of our clients.”
Other professions (12)	
Develop skills (7)	
Effectiveness (21)	“Learning about and normalizing interprofessional activities and collaboration is an essential skill for working in public health.”
Relevant to practice (4)	“I don’t think you realize the value of each professional and the roles they all play until you participate in an IPE conference/activity.”
Advocacy for profession (1)	“It allowed me to practice and become more confident with speaking up in my own profession.”
Understanding benefit (9)	
Enjoyment/fulfillment (4)	
Appreciate team (3)	
Limiters (9)	
Not helpful (2)	“As a dietetic intern I was looked down on or scoffed at for recommendations because they went against now outdated recommendations that doctors learned in their single nutrition class.”
Inadequate resources (1)	“I found that other training healthcare providers were less knowledgeable about the dietitian’s role in healthcare.”
Wanted more (1)	
Don’t recall (2)	
Not emphasized (1)	
Not reflective of practice (1)	“While I still value the importance of this now, I don’t feel I have the resources to initiate those activities on my own and my department does not currently foster any relationships outside of ourselves.”
Not respected (1)	
Other professions (8)	Speech therapy (3)
	Nursing (2)
	Certified nursing assistants (1)
	Physicians (1)
Activities/Assessments (3)	“Participating in hospital rounds” or “Daily huddles” (2)
	“Particularly helpful was one project where I got to witness a wound care nurse’s duties and discuss the implications of tube feeding on her patients wound healing.”
Gaps in Practice (2)	“It would have been nice to understand the roles of the teams we work with every day and what our involvement would be with them.”
	“More simulation and interactive labs would have been a great addition.”

Other Professions

Results from one practitioner item on the survey provided further insight into IP practice trends in early-career dietitians. Table 14 summarizes the frequency distribution of

the survey responses ($n=103$) to the prompt, “Thinking about your current practice, please select the rating that best describes how confident you feel about collaborative practice with the following health professionals.” The highest level of confidence was found most often in working with nurses ($n=59$), followed by nurse practitioners ($n=49$), speech language pathologists ($n=47$), and physicians ($n=42$). Physician assistants ($n=36$) and case managers ($n=34$) were also reported frequently in the high confidence category. Professions seen as “not applicable” to current ND practice were most frequently reported for optometrist ($n=55$), dental practitioners ($n=46$), and exercise specialist/trainer ($n=37$). A wide range of results was expected in designing this question. No publications on this topic were found in the literature review, a deeper investigation was therefore warranted to explore dietitians’ self-perceived confidence in working with others. The details here are helpful to correlate with qualitative results in evaluating the impact of pre-professional IPE on the level of confidence in working with other disciplines. Theoretical underpinnings of this study were based on the social psychology concepts of Intergroup Contact, Social Identity, and Transformational Leadership Theory, and adult learning concepts of Reflective Practice, Experiential Learning, and Self-Efficacy Theory.

Results from the qualitative data indicated a wide range of other professions participates in the IPE training experiences of ND programs. Responses were analyzed by counting every type of profession stated in the discussions in response to various prompts. Some were indirect, and some were a result to the direct question, “Which other professions have you worked with to develop or deliver an IPE activity for your nutrition and dietetics students?” Every group cited at least five different ones, and three groups offered as many as 12. A total of 25 professions were captured in this study using responses from all segments. As expected, the most common observation was shared between nursing and medicine. Other observations (not included in Table 14) demonstrated a wide breadth of IPE experiences as

athletics, athletic training, audiology, certified nursing assistant, clinical lab scientist or researcher, community-based health team, culinary medicine, disaster management, occupational therapy, patient advocacy, public health, and social work. Therefore, relevant gaps in current educational practices are noted in transferring practitioner competence in IPE related to many other professions, different from the traditional health care settings. Further, data confirmed that there are meaningful opportunities to gain IPCP benefits by enhancing IPE opportunities and promoting student exposure to a variety of professions, even those that are not so obvious, like legal, education, and research. Quoted statements are displayed in Table 16e.

Table 14 Reported confidence in IPCP with other professions (n=103)

“Thinking about your current practice, please select the rating that best describes how confident you feel about collaborative practice with the following health professionals:”						
Profession	Not Applicable	No Confidence	Minimal Confidence	Neutral or Unsure	Moderate Confidence	High Confidence
Case manager	15	2	4	16	32	34
Behavioral health provider	22	4	10	19	25	23
Dental practitioner	46	8	14	20	8	7
Exercise specialist/trainer	37	1	4	17	25	19
Nurse or nurse specialist	2	1	3	2	36	59
Nurse practitioner (ARNP)	5	1	3	6	39	49
Optometrist	55	8	9	19	8	4
Pharmacist	18	4	7	13	33	28
Physician	3	1	10	6	41	42
Physician Assistant	16	1	6	7	37	36
Physical Therapist	26	2	3	17	30	25
Speech Language Pathologist	18	3	1	5	29	47

Gaps in Practice

Focus group participants were prompted to identify potential gaps in current practice by asking them to design the ideal scenario to promote IPE in nutrition and dietetics in their programs. Quoted statements are displayed in Table 16f for illustration. Responses were counted and placed in descending order by frequency as 1) educator training; 2) creative tools and clear objectives specifically related to IPE in nutrition and dietetics; 3) starting IPE at the undergraduate or high school levels such as pipeline programs; 4) dedicated IPE coordinators within program and program settings; 5) academic structure or funding to promote educators to take on more IPE activities; 6) frame IPE as broader challenges and areas where nutrition can benefit many stakeholders, such as poverty, food insecurity, and disaster relief.

Participants were also prompted to offer any other recommendations as best practices to improve the current state of IPE in nutrition and dietetics. This was done to ensure data saturation was reached, and participants were allowed reflective time for any ideas to come forth before concluding the sessions. Two groups offered no additional responses. A common sub-theme here was about promoting the dietitian as an “equal member of the team” and developing “skills in difficult conversations.” Also, the concept of promoting “different perspectives” was mentioned, but it was coded and analyzed under Effectiveness. Educators called for the “sharing of ideas” and the development of new “case studies” to replace outdated and “archaic” activities that are currently used in many programs. Finally, rural health communities were mentioned as an opportune setting for promoting IPCP. While these recommendations were slightly different than other observations, in general, they aligned with ideas for improvement in practice and were not considered new.

Results from the practitioner survey were also analyzed for gaps in practice. Participants first rated their competence related to working with various professions. Then they were prompted to offer open text comments to the following statement, “Looking back

now on your pre-professional program, what would you recommend, if anything, be added to your learning experiences to better prepare you for interprofessional practice?” A total of 47 comments were coded into 52 segmented data components and categorized under five sub-themes: improvement, reflection, other professions, promoters, and limiters. After reviewing in more detail, the data were further reduced into three main groups as displayed in Table 15. The majority (80.7%) provided a direct or tangible suggestion for improvement. These tend to echo the suggestions of the program directors. Examples included “expanding what IPE means,” “more opportunities to work with other disciplines,” and “working with more specialties than just doctors and nurses.” Seven comments (13.5%) were noted as more reflective in nature, such as “I was well prepared for interprofessional working conditions” or “I was fortunate to have interprofessional collaborative practice.” Three comments (5.8%) related to other health professions, and these already occurred in other data sets. No new information came from this sub-theme.

In summary, the mixed methods research provided rich data to confirm the hypothesis that there are relevant gaps in current practice. When addressed via innovative educational strategies in pre-professional programs, there are ample opportunities to better support the transference of IPE concepts and collaborative-ready RDN practitioners. The discussion in Chapter 5 will develop this point further in discussing the implications for future practice.

Table 15 Qualitative survey responses on recommendations

“Looking back now on your pre-professional program, what would you recommend, if anything, be added to your learning experiences to better prepare you for interprofessional collaborative practice.”	
Qualitative Code/Sub-themes	Sample Qualitative Responses
Improvement (42)	“Involvement in interprofessional council/club to expose all healthcare students to the various roles that will communicate/collaborate with.”
Experience authentic IPE (12)	“I didn’t have to talk to doctors as much in my internship as I do now. I could have used more opportunity for this.”
Work with others (9)	“I would recommend providing experiences for collaboration outside of healthcare as some could find position or job that are not in health care.”
Know other roles (7)	“I would have liked the opportunity to witness more procedures and exams done by other professionals like a modified barium swallow.”
Shared coursework (4)	
More interaction w/others (4)	
Attention on DEI topics (2)	
Student-led IPE activities (1)	

Expanding definition IPE (1)	“More behavioral health practices”
IPE outside of healthcare (1)	“Simulation, video examples or interactions, and interactive labs between
Better teaching practices (1)	RDs and every one of the health professionals listed above.”
	“Any emphasis on diversity and inclusion, better background on the clinical care setting. I feel there is a lack of racial, gender, body size, ability, and sexuality education among folks in the health care setting.”
Reflection (7)	“I feel strongly that my program prepared me for the realm of
Well prepared (5)	interprofessional work and I continue to seek this in my position.”
Fortunate (1)	“I think communicating in general with other professionals early on helps
Builds confidence (1)	build relationships and confidence to advocate for your patient.”
	“I feel I was well prepared for interprofessional working conditions.”
Other professions (3)	Speech therapy (2)
	Physician Assistant (1)

Table 16 Focus group participant quotations and themes

a. Educator Factors	
Participant Program Type	Qualitative Responses
Dietetic Internship	“The formal training has been very limited, I would say there’s maybe a handful of webinars that I’ve participated in over the last few years, either some led by ACEND, or you know, kind of an educator focus.”
Coordinated Program	“For me, it’s mostly trying to pay attention whenever there’s webinars. I think these are really important competencies out there in the field. There’s really no life experiences or training. It’s kind of learning from others when they’re willing to share.”
Future Graduate Program	“Right now, I’m not practicing personally, but I’m working with our physician assistant department, and we are working to put a CME together for physician assistants. A large component is nutrition, so they came to me to work together.”
b. Promoting Factors	
Participant Program Type	Qualitative Responses
Dietetic Internship	“Promoters, for us, would be administration. Also, we as I had mentioned for our care conferences, we partner with a foundation that represents that patient, the disease state we want to focus on and then our care center for patients is a big promoter as well. We cover more rare diseases, and this is something that just enhances overall awareness as well.”
Coordinated Program	“I think getting experiences that hit several competencies at once would be ideal. So, if we could find some IP activities that hit. A bunch of competencies, and you know, we could roll that all in, that would be great. So, if somebody has it pass it on.”
Future Graduate Program	“There were other departments like kinesiology who want to work with our students, and they reach out. So, it’s kind of other health professionals contacting us. I guess that is the other end of it.”
c. Limiting Factors	
Participant Program Type	Qualitative Responses
Dietetic Internship	“There is the work hierarchy within the medical field, and you know, we fall under here. Those people don’t want to play with them, I feel like. It limits people’s maybe willingness to even think about collaborating

	because they feel like they're not going to be heard anywhere. They're not going to be valued, or they're just going to do what they want to anyway."
Coordinated Program	"We are an inner-city school and have students that are working full time 40 and 50 hours a week trying to do a coordinated program. We know we see burnout. In fact, I sent an email to a student today, asking 'hey I want to check up on you. You're missing some classes. You don't look like yourself,' you know."
Future Graduate Program	"I feel sometimes we get invited to events when students are in their supervised experiential learning, and I don't want to pull them out of it to go back to the classroom, and that happens a lot. And then they will not have anyone from nutrition to be able to participate, and I feel badly about that. It does not reflect well on our department."

d. Effectiveness

Participant Program Type	Qualitative Responses
Dietetic Internship	"We do not necessarily score each and everything that they are doing, but I feel like each and every encounter that they get helps build their confidence, and they have less of that imposter syndrome and recognize the value in what they're doing and they're less afraid to speak up and just builds their confidence."
Coordinated Program	"It teaches the students that, well, 'I can rely on the nurse, or I can ask a nurse a question or I can ask the pharmacist a question, or we can work with the pharmacist.' I think that that's extremely important because if they've never worked as an interdisciplinary team before they get into the field, they're not going to know how to do it, or what to do, and so you know, you can do a crisis management simulation but it's not necessarily teaching the same concepts of health professionals working together."
Future Graduate Program	"Mock simulations with standardized patients in that room with a student actor who has CVA and a family member so that's when they get to learn all the dimensions. What they do so then when they get into their rotations, they know who to call upon. I think that's so beneficial before they get there. It's a really good teaching and learning experience."

e. Other Professions

Participant Program Type	Qualitative Responses
Dietetic Internship	"We've been on a hiatus for the last two years, but there is a resurgence coming so I know there will be a push to do something to get the pharmacy students and perhaps the physical therapy students, nursing students, nutrition students, maybe medical students to do something, you know, more practice based. Nutrition is a good universal solvent."
Coordinated Program	"We tried to make it so that students usually participate in one IP simulation each semester of their coordinated program, so they have four by the time they're done. If they want to add another one, that is great. It's a case study, and we always have nursing, social work, now we have disaster management, and we have our dietitians. We have speech language pathology. We have audiology, and so they have all been very participatory. We've used family members too."
Future Graduate Program	"Our students work with the culinary or food medicine, the culinary residency program. They work with MDs and residents."

f. Gaps in Practice

Participant Program Type	Qualitative Responses
Dietetic Internship	"The goals and aspirations are barriers, but we're hoping to get at least a part-time IP coordinator that would work for our college and help coordinate all the activities between the different programs."
Coordinated Program	"None of us receive load to do all these IP activities, and although you know we're dedicated to our career, we only have some many hours in day. And we've tried hard at the university to have an IPE class or course and you know that way someone would be able to really home in with the students on IP. It could only be one credit. That helps with, well, who is going to teach it well. We want every discipline to be in there to teach it well, only one person can get load for a course, so that had gone nowhere, and that is unfortunate because I think the better simulations are the ones that we spend more time on."
Future Graduate Program	"They have to reflect every semester on what they learned, how they met the competencies and keeping track where they're going to what they want to focus on the next semester, how they're going to meet that competency. So, I'm thinking we could add you know, specifically, IP stuff to the portfolio as well, which would be another self-reflection."

Chapter 5 Discussion

Summary

The current state of IPE in nutrition and dietetics calls for quality research about the most effective ways to train students and to understand how efforts during pre-professional programs impact and promote the development of collaborative-ready RDN practitioners. While uniform professional guidelines and accreditation standards for interprofessional competencies exist, very little is known about the perceived value and benefits in the long-term practice of dietitians. Challenging the status quo, this unique study sheds light on the complex interplay between IPE training activities for dietitians and workforce demands specific to interprofessional practice. The measure of self-rated competence in IPCP variables was used to better understand how pre-professional education transfers to and promotes practitioner success in this area. Moreover, significant findings and consensus of various data showcase important future directions for ND educators.

The aims of this study, which formed at the intersection of theoretical models and current practices, were successfully met through a variety of quantitative and qualitative measures. Important and relevant information was gained about how early-career RDN practitioners perceive benefits from self-competence in IPCP, how pre-professional programs approach the challenges of providing effective IPE, and what gaps exist in current practice to shape future directions in the profession of nutrition and dietetics.

Conclusions

The first aim of this study investigated how IPE activities during pre-professional programs influence new practitioners' level of competence in IPCP. This was a broad, founding goal with smaller targeted objectives for testing various research questions. Mixed-method results found that learners' knowledge, skills, and attitudes about interprofessional

competencies are indeed assessed through a variety of activities as expected. As this was the first time such an endeavor was documented specifically in the field of nutrition and dietetics, this aligns well with recommendations from IPE leaders for optimizing the impact of educational strategies.^{1,75,78} This study embraced the call to action from leaders within the profession of nutrition and dietetics.^{14,19,66} Also, it directly responded to the work of Koemel and associates⁵¹ who identified that very little research exists on career readiness for RDNs. Overall, these results found that educators are doing what is necessary to bring important IPCP concepts into pre-professional programs and integrate the role of the Registered Dietitian into health care and other work teams.

IPE Activities

This study documented 14 different types of IP learning experiences, and many occurred at the higher levels of learning recommended for the best student outcomes in terms of adopting positive values around interprofessional collaboration and functioning within productive team environments. This is an important affirmation for educational leaders who are charged with critical work to transform students into collaborative-ready practitioners and nutrition and dietetics leaders within complex organizations. However, in this case, a meaningful opportunity was identified by finding that most IPE activities are offered at lower levels of learning. In referencing the Kirkpatrick/Barr Hierarchy,⁷⁵ current practices more often approach learners' reactions or attitudes with the experiences, and some work at the level of developing new knowledge or skills. While they are important and do meet the accreditation standards for addressing interprofessional education, they stop short of drawing students in further to the process and evaluating their performance competency within the key transformational areas of behavioral change (transferring to practice), organizational change (delivery of care), and benefits to patients/clients (improvements in client well-being). These higher levels of skills and abilities are required under Essential Practice Competencies¹⁴¹ and

involve critical thinking, decision making, cultural sensitivity, judgment, and ethical practice; all can be successfully addressed and amplified through IPE.

Consistent results to reinforce this conclusion were found on many levels throughout the process of this study. Quantitative data revealed significant findings related to the type of IPE activity and practitioner competency, and this will be described in subsequent sections. Qualitative data from survey respondents and program directors identified the most effective experiences and assessments involved authentic team training or student involvement in actual interprofessional events. This finding aligns well with the concept of Conscious Competence^{98,100} wherein professionals engage through a mindset of inquiry, concentration, and attentiveness related to a subject. In this case, the most effective IPE activities were viewed as those that occurred with purpose and intentionality. Successful IPE can be measured in many ways, however, if the goal is to truly empower ND students with this value and champion the active pursuit of this concept as a professional practice value,^{14,19} then improvement is needed in the ways this is addressed in pre-professional programs. Examples of best practices found are case presentations, embedded coursework, simulation, interactive labs, collaborative care clinics, hospital rounds, and practicums. The nature of RDN preparation involves supervised training of students or interns in professional settings. Therefore, “practicums” was expected to perform well in the analysis as this experience is typically coordinated in settings where dietitians work, and students are exposed to real-world performance in the workplace. The rest are associated with the direct influence and control of ND programs, and therefore can be aspirational in looking forward.

As health care organizations embrace stronger initiatives around quality improvement and emphasis on patient-centered care, so too must go the educational and training process of dietitians to fully promote effective teamwork and interprofessional collaborative practice. It will not be easy. Undoubtedly, improvement efforts will require intentionality, dedication,

and passionate leaders in the profession since addressing the challenge also requires the involvement of multiple stakeholders and organizational commitments. However, the current community of ND educators is strong and fit for the task. There is a multitude of global organizations that can help support the cause with professional networking, resources, and general momentum in this area such as Nexus,⁸¹ CIHC,⁸² IPEC,⁶ and the National Academies of Practice¹⁴² Results here seek to inform the profession about the maximizing the leverage of certain IPE activities.

Practitioner Self-perception of Competency

A unique attribute of this study was to consider how early-career RDNs perceive themselves in this area and evaluate their own ability to practice the expected performance outcomes as working professionals. To accomplish this, theoretical concepts from Self-Efficacy Theory¹²⁵ and Social Identity Theory¹⁰⁹ were borrowed to obtain two measures. The first was a self-classification of practitioner competency using the same definitions provided by the Academy of Nutrition and Dietetics in designating proficiency levels,¹⁸ which are based on the Dreyfus model of skill acquisition and problem-solving ability.^{47,48} The next item collected Likert-scale ratings using a validated tool⁹⁴ to measure individuals' agreement with statements in the IP domains of values and teamwork, used in many applications to inform curriculum planning and development to best promote IPCP. The underlying postulate here was to evaluate how one influenced the other as purported in the constructs that shared training can enhance students' identification with their own profession and reinforce a feeling of usefulness on the team. Each health discipline embodies a unique professional culture that influences the educational experience of its members through curriculum content, core values, customs, dress, and professional symbols, for example. Further, within IPE experiences, the framework of IPEC competencies should build on learning activities that

explore multiple roles, teamwork, and communication around the socialization process to generate a professional identity. McGuire et al¹⁰⁸ used this theoretical model to assess the effectiveness of an interprofessional course in ethical decision-making provided to over 2100 pre-health professions students. This was a very useful model to address the second research question in this study about both how professional and interprofessional identities may facilitate the development of integrated identities. This would have high merit in developing best practices in education.

To look first at how early-career practitioners see themselves in the realm of interprofessional practice, survey participants were asked to classify themselves in response to this item, “How would you describe your current level of competence related to interprofessional collaborative practice?” Results in this sample of RDNs practicing four years or less showed that most (63%) identified at the entry-level of practice (Novice or Advanced Beginner), as defined by the Academy.¹⁸ Only 35% identified at the Proficient level, and 1.9% identified as Expert. This finding was a bit perplexing since pre-professional programs prepare graduate candidates for the credentialing exam at the Advanced Beginner level. Therefore, it was expected that most would feel stronger about their overall professional competence, yet this was not found. This can be explained in two ways. First, participants may not have understood or were not familiar with the formal definitions of competency, as previously discussed. The four options were simply presented, and the participants selected by their own interpretation. Therein lies the significance of the second possible explanation for this finding. Since classifications were aligned directly in this survey with IPCP, self-rated competency may have shifted left or downward to beginner levels as ND programs are still really developing this expertise and there is inconsistency in how IPE is carried out. The sample also questioned practitioners about experiences that occurred a few years ago, which are not as consistent with trends in education today. Findings were interpreted as practitioners

do not recognize a proficient level of IPCP, and therefore ND programs need to better address this in the pre-professional phases of training.

The next variable measured frequency distributions of scaled ordinal data in response to statements about teamwork and interactions to calculate mean scores. This was also a measure of competency, but it further elucidated the practitioner impressions associated with authentic applications and descriptions of IPCP in the professional work environment. The hypothesis tested here was that early-career dietitians would have a moderate perception of values and interactions related to interprofessional practice. When ratings were coded via the research tool specifications and then collapsed for final analysis, findings indicated that this sample indeed had a moderate impression of interprofessional practice. The mean score was 4.19 ($SD=.516$; range = 3 with scores ranging from 2-5) on a scale of three levels: 1-2 as low, 3-4 as moderate, and 5 as high. It was expected that active RDNs at this point in their career are truly interacting with other members of the health care team and have therefore gained more personal experiences around this topic. This is a natural evolution of building practitioner competency. In retrospect, it is difficult to say with a high level of certainty what this finding truly means to educational practices. Like the discussion by Lockeman, Dow and Randall⁹⁴ who developed the tool with health professions students, competency self-assessment is a valid measure for the IPCP competency. Important to note, the authors cautioned that their findings may suggest the instrument subscales could be affected differently by experience and training. Potentially, in this case, self-reported scores may be higher for RDN practitioners who have gained more IP practice and experience after entering the workplace. The way the data were analyzed herein attempted to mitigate this potential issue. Further, as a unique study, no valid instruments were found to permit the researcher to isolate and directly measure the effect of pre-professional activities on practitioner competency several years after the experiences occurred. This was a best-case scenario.

With the hypothesis confirmed, it is important to interpret the two measures together. While RDN practitioners are doing well in adopting the fundamental values of IPCP, there is still a gap in developing professionals who exhibit keen self-awareness about and understand the significance of the IPE process. As noted in earlier chapters laying down the foundation of this study, the future of the profession depends on those who envision themselves as valuable, productive members of a team and can effectively lead IPCP. The findings support the need for more authentic experiences with IP training to connect pre-professional ND students to an integrated identity of professional and interprofessional standing.

Relationship Between Practitioner Competency and IPE Activities

The next component focused on the relationship between the types of IPE activities in pre-professional programs and new practitioner competence. It was postulated that, based on the literature review and adopted models of Intergroup Contact Theory, Self-Efficacy Theory, and Experiential Learning, activities that are delivered through student interactions engaging with effective interprofessional teams would have a greater level of impact on competence. Again, the self-rating scales provided by the RDN practitioners were used as a DV measure. The hypothesis was tested and found to have no significant associations with the IPE activities. This was not expected, and the results were reviewed and verified. One possible explanation for this outcome could be that the relationships between these two factors are far more complex than the testing can ascertain. Another explanation could be associated with the broad terms in which practitioners may have defined the type of activity. In calculating Mann-Whitney U, two groups are compared. In the treatment of this sample, the comparisons were computed on those who did and those who did not choose a specific IPE activity on the survey. It could be possible that this introduced error in grouping data variables this way, but it is a very difficult relationship to measure. Under the circumstances, this seemed the best

option, especially with non-parametric data. As an innovative study, there were no other comparison methods to guide the analysis of this hypothesis given the data collected.

There are also many confounding variables in educational programs and IPE activities, and more than one exposure contributes to the development of an individual's competence and feelings of confidence in practice. Perhaps this broader picture is in play. However, when overlayed with rich qualitative data obtained in this study, information about the effectiveness of IPE comes to light through narrative comments from survey respondents and focus group themes. Results are described in greater detail under the integrated results analysis of Hypothesis 5, Effectiveness. There was overwhelming support that the type of IPE activity mattered to the current practice of RDNs. The type of activities described the most by expert educators when prompted, "Which activities are most effective to prepare future RDNs?" are the ones delivered at the highest level of learning and strive to engage students in meaningful, authentic team experiences. These are also associated in reflective comments by the survey participants when asked to describe the "value" of the IPE activities they encountered during their ND programs. Examples consistently cited in both samples include case presentations, care conferences, interprofessional clinics, hospital rounds, and simulation experiences (disaster drills, complex patient care cases, or skills workshops). Therefore, although statistical significance was not confirmed, for this type of research question, the qualitative feedback from those intimately involved in the process is more relevant and should prevail when composing recommendations for future practice.

Benefits from IPE Activities

It was important for the aims of this project to clarify how practitioners glean benefits from IPE during ND programs. To address this question, two unique items were added to the survey and prompted respondents to give a Likert-scale rating of how much they agreed with

the statements, “My pre-professional program effectively prepared me for interprofessional collaborative practice,” (“effectively prepared”) and “I will continue to seek out experiences in interprofessional education as an RDN” (“seek out”). Based on tenants of Intergroup Contact Theory^{103,105} and Reflective Practice Theory,¹¹⁵ collaborative-ready ND practitioners are willing and intentional to openly embrace interprofessional practice. Learners gain knowledge and skills through active learning and social experiences. Reflective practice can therefore recognize a behavioral change. Specifically, a positive change in the dimensions of professional practice is achieved. This test was also supported by the tenants of Conscious Competence.⁹⁸ Thus, it was assumed that effective IPE would be closely linked to favorable ratings from practitioners in these measures.

The results for these two measures were mixed. To evaluate for significance, each IPE activity was treated as the IV, and the scaled rating on each target item was tested as the ranked DV with the Mann-Whitney U statistic for non-parametric data. Again, for each type of IPE, two groups were analyzed as chose/did not choose. Significant findings confirmed stronger results for “effectively prepared” when individuals experienced the following: independent assignments, embedded coursework, interactive labs, simulation with team, and practicum experience. Conversely, there were no significant findings for “seek out.”

From the quantitative data, an important conclusion can be made about IPE that is intentional, well planned, and engaging for students. While all results above indicated a high perception of effectiveness in achieving the goals and objectives of interprofessional practice, three of the five activities are associated with working in teams with other professions. This is a challenge in some program settings, as reported by one dietetic internship which operates in a hospital with no other health professions students. The last two significant IPE activities for “well prepared” indicate intentional curricular elements around IP. While these are not typically conducted with others in a collaborative setting, it is not clear from this data, nor did

this research examine, how IP activities are implemented in programs to achieve such results. During focus groups directors were only asked to identify what activities they perform and how they measure student outcomes. However, by analyzing the qualitative data from survey responses about “value” of IPE activities experienced and for “recommendations” to better prepare dietitians, the significant findings are further validated and described. The details of this were discussed in Results Chapter 4 and led to important conclusions about where educators should spend their time and effort in training students in IPCP. In addition, the most significant IP activities were associated with the higher levels of learning promoted by the Kirkpatrick/Barr model.

This additional finding confirms the significance of the overall results and should therefore empower educators to strive for developing and delivering more engaging experiential training in interprofessional collaborative practice. Going one step further, the results from focus group data, analyzed under the theme of Educator Factors, yield important implications that educators, in general, report a worrisome lack of formal training in IPE which will have a negative effect on programs to implement needed changes. Also, most directors reported limited personal practice in these concepts, indicating there are persistent barriers in role modeling, implementation, and lived IP experiences in those who train ND students. This finding is contrary to the goals of IPE wherein dietitians lead practices and intentionally approach IPCP with a mindset of inquiry. Although continued competence as a dietitian and ongoing professional development are fundamental practices within the profession, there exists such a wide range of interests, methods, and specializations that IPE and IPCP may not be top of mind for all educators. This highlights the challenge of competing demands for educators’ time and attention. Certainly, more research is needed in this area to draw further conclusions and elevate the priorities of how IPE is hard-coded into professional expectations and program outcomes. As it stands now, too much variation in the

practices and guidelines hinders the ability to draw definitive recommendations other than there are significant benefits from IPE, as defined in terms of how early-career RDNs felt prepared for current practice and reflecting on their pre-professional education.

Gaps in Practice

The second overarching aim of this dissertation project was to integrate the findings to gather important insights into existing gaps in practice and to address those with possible recommendations. The results for Chapter 4, Hypothesis 5 provided much information about where efforts to strengthen IPE should go next. The results were expected for the most part and consistent with others^{37,39,57,63} who have published specifically about nutrition and dietetics, although no one has yet to study the topic in such a manner as this project did. There is an obvious matrix of factors involved in educational programs, thus the discussion herein focuses on factors that are more controllable by individuals or program directors and influenced by accreditation or professional standards of practice. As mentioned previously, educators have a direct influence on IPE for their programs and students. It was reported in all focus groups that educators had no formal training in this area. In fact, this was the same for all participants. Given the unique expectations for ND practitioners and the fact that more standardized options are available to evaluate student outcomes, correcting this issue should be an immediate response. That will require commitments from individual educators as well as setting organizational expectations to improve this variable. Educators can also step up for leadership positions that offer training and professional development in this area. Another example would be cross-linking with other professional organizations to expand IPE training opportunities. This demonstrates integration, shared perspectives, and new techniques to educators who are in constant need of creative infusions of ideas, tools, and resources.

The next area of improvement that should easily be attainable for educators involves reshaping existing perspectives about who should lead IPE within organizations and schools. Dietitians are well prepared to step out as champions in IPCP and should be more visible across all programs. It may create an uncomfortable situation at first, but volunteering to serve as an IPE coordinator or initiate a faculty committee within the organization could be a positive start. Mentoring and professional practice groups within the Academy often highlight IP training and activities, which were mentioned frequently in the focus groups. It is worth noting that most directors who responded to the recruitment emails indicated that this IPCP was already something they had an interest in or were seeking to learn more about since they were responsible for meeting the ACEND standards. The years of practice in ND education ranged from 7 to 40. This could introduce a potential bias in favor of IPE in this sample. Yet, no one reported assuming or experiencing leadership roles. Dietetic programs were usually invited to the IP events or asked to help other professions teach their students about nutrition. This dynamic must change to advance interprofessional practice in this field.

The most telling observations occurred under the theme of Effectiveness. Quantitative data from the survey confirmed that a majority (96%) of RDN practitioners could recognize an emphasis on IPE in the program's curriculum, yet 48% reported indicated the impression as moderate, and only 14% rated that as foundational. This finding is interpreted to highlight that there are weak connections between what is taught in programs and what is realized in practice. Educators can do more by looking at all learning activities and layering those to demonstrate more integrated practice. The use of reflection could be one way as a powerful tool or placing student outcomes as milestones in professional portfolios. Ensuring that students all share the same experience within IP activities could be another. Educators should promote the idea of "working smarter, not harder" in planning innovations to rely on broader

teams so that these interprofessional experiences can trickle down to students. Again, this is an opportunity for role modeling and personal practice by educators.

Educators should strive to create authentic activities outside of traditional arenas that can creatively implement IPE concepts. For example, one CP director mentioned a food service application of a pureed food lab that was very high performing for her students. Assessment of areas for improvement confirmed in this section should promote critical thinking skills and relate experiences around the team dynamics. Creating IP experiences for students centered around patient care was reported in all groups. One director of a CP program described IPE activities as “building confidence in advocating for nutrition.” Other examples of the most effective IPE activities were shadowing other professionals, grand rounds or case presentations, mock simulations with standardized patients and several disciplines, and staff relief. All can be implemented with a small dose of enthusiasm and commitment to the practice.

Another observation seen as a gap in current practice is methods for assessment of student outcomes. Effective interprofessional collaboration and practice rely on “soft skills” such as using subtle communication techniques, building rapport, interpreting non-verbal body language, developing a sense of inclusion, and resolving conflict. For example, one educator stated, “dietitians should be seen with equal skills in difficult conversations.” These are challenging skills to teach students and even more challenging to effectively assess in performance. The type of IPE activities observed in this study was previously described under Results. The focus of hypothesis testing did not require a comprehensive review of what educators reported about this area during the focus groups. Qualitative data recorded by the researcher provided the conclusion that programs struggle with student assessment for IPCP. Comments such as “looking at growth over time,” “designed to be meaningful,” or “evaluate the experience” were offered in response to the question, “How do you measure

student outcomes?” Three of the five groups went silent at that point and could not offer any further comment, even with probing from the researcher. One group then offered “ice breakers so they can learn about each other” which is considered an activity or learning experience and not an assessment of competency. Specific examples of evaluation tools provided were surveys about the experience, pre- and post-tests to check for knowledge change and a learning assessment portfolio. Only one group member reported that students assess the effectiveness of the activity, and two educators mentioned the use of reflection to elicit qualitative data on how students see themselves in the team as part of the event. Therefore, most student assessments in IPE reported were confirmed to be performed at the lower levels of learning (reactions, attitudes, and knowledge). The most frequent assessment tool reported was a grading rubric, but the scope and criteria of student performance was not further elucidated due to timing limitations. This could be an effective tool if applied to key performance criteria around behavior change, organizational change, or benefits to patients. Two groups reported that preceptors are tasked with evaluating student competencies in this area despite that all the educators mentioned they offer no specialized training for IPE and assessment for IPCP skills in students. This would be one helpful way to improve student experiences in practicums since this was such a significant activity found in this study.

Overall results here underscore a continued need for the development and sharing of tools and evaluation resources specific to nutrition and dietetics. As noted in the discussion for Hypothesis 5, educators called for “guidance,” “reciprocation,” and “new case studies” to serve programs better. The data suggest programs that are part of a large health care organization or academic center for health professions are better suited for IPE, especially when it comes to resources and practices. Standardized tools, for example, are easier to implement when they are provided by a centralized IP center as a universal benchmark for all students. This is certainly the ideal model promoted by many authors.^{40,143,144} Smaller

programs and those in unique settings demand more intricate relationships and initiatives to achieve similar results, which may not always be possible. Technology applications and advanced virtual platforms could be used more readily to generate information highways for educators in this field. Professional associations and member interest groups in nutrition and dietetics can also contribute to a network of resources to help educators along with professional development in IPE education best practices. Alternatively, educators could work more collaboratively with other professions and implement the wide sources of student assessment tools available to the IP community.^{7,81,85,122,142,145,146} Given that the survey participants agreed that IPE activities are highly valued in their professional development and that educators expressed uncertainty and hesitation about the direct assessment of learners' competency from the same activities, work in this area is greatly needed to address the gap.

Finally, opening public dialog and professional spaces for IPCP is a critical element in building collaborative-ready practitioners. Through the RDN survey, some interesting data came forth about new opportunities where IPE is not currently being emphasized or practiced. It was expected that working with physicians and nurses would yield a higher level of practitioner confidence as the nature of their relationships promote this connection. However, opportunities are yet untapped to work with behavioral health, dental medicine, exercise/trainer, pharmacy, and optometry, physical therapy, for example, were found in this sample. Perhaps networking with these professions could start the process on a smaller scale in programs that do not have a strong IPE effort. These all have important areas where nutrition can make an impact. Working with professional associations in these areas could also bring some collaborative solutions. For example, the ACEND standards involve pharmacology recommendations that could involve pharmacy students in creating a nutrient and drug interaction tool. Developing a nutrition and eye health program could be another desirable option with optometry students. It was a big surprise to find that 36% of RDNs do

not see working with exercise specialists as applicable to practice when nutrition and physical activity are critical elements in ND practice. As professionals, dietitians certainly have much to gain by allying with experts in this area. Seeking out alternate professions in delivering IPE could also help steer away from the traditional barriers seen in health care by team hierarchies. This finding was observed a few times during the analysis of Limiting Factors.

In conclusion, IPE can be further enhanced by evaluating the resources and interests in the current program setting as well as across ND programs. Building IPE activities around the inherent strengths where collaboration is easier to start up and can assist the program in setting long-term goals on key strategies to add more along the way. One final idea that was mentioned generates the benefit of promoting student-led IPE whenever possible as a way to touch on several related competencies, especially leadership, communication, and teamwork.

Strengths and Limitations

This study has the strength of this mixed-methods research design to collect a wide range of data to help explain the possible relationships between pre-professional education and the outcomes of professional competencies for IPCP. It also examined both perspectives, students and educators, to consider long-term implications in practice. Focus groups provided rich qualitative data about how educators train student dietitians in IPE competencies as well as more clearly defined limiters and promoters of IPE activities in practice. The quantitative portion collected variables about practitioners' current IPCP, which is the first time this focus area was explored and documented. The study used a reliable and effective tool to measure practitioners' IPCP interactions and values. This 16-item instrument has been refined and confirmed on multiple occasions with high validity evidence to improve respondents' responses while reducing survey fatigue and effectively measuring the IPEC domains of Teams and Teamwork and Values/Ethics.⁹⁴ Another strength of this study is that built upon

the latest summary of the state of IPE in nutrition and dietetics¹⁴ and shifts the research questions from testing *if and why* programs conduct IPE activities to examining *how* programs meet the competencies and *what impact* pre-professional training has on preparing collaborative-ready practitioners.

However, the research is not without limitations. For the quantitative portion, one observation is that the RDN sampling was predominantly female. Five males participated in the survey process, and two others chose a different gender response. Not unlike the natural distribution of the profession, this analysis could potentially exclude important perspectives from other genders that were not captured. Another concern is a less-than-desired response rate from a larger group of eligible participants. A target pool of early-career dietitians was set at 172 for the maximum statistical power. However, complications and barriers in how the RDN practitioner sampling took place through the Academy of Nutrition and Dietetics did occur. While a total of 463 (9.3% response rate) surveys were returned, many were incomplete and excluded from the analysis. Further, refining the pool to include only the group of early-career practitioners limited the final analysis sample to 103. While significance was found with small to medium effect sizes for non-parametric data, this could affect the margin of error and the reliability of the results. Findings should be taken with caution. When integrated with the qualitative data, however, the impact of this issue was mitigated.

Focus groups take a greater amount of participant time, and the number of participants who joined was limited from an ideal target of 20, despite the incentive offered. Participant no-shows, late cancellations, and failed responses to choose an interview date accounted for some attrition. Many session options were offered, including nights and weekends, to meet a variety of schedules. Recruitment took place over the spring recess for many universities, and this could have affected the responses. However, the final sample count (13) was within an

acceptable range. The resulting sample was all female and therefore does not have any perspectives from other genders, although program directors should be able to fully represent their universal role without bias. Once the final group took place, it was determined that no new information had come forth, and the study had reached data saturation.

Another factor that could reduce the generalizability of this study is that there is not a full representation of all possible ND programs. Sampling for the practitioner survey was randomized in a list of 4967 names provided by the Academy of Nutrition and Dietetics, for which there was no control in selection. This information was handled by the research committee of the Academy. Snowball or convenience sampling helped to reach broader audiences through social media and networking, but this too had little control to precisely target a representative sample. Overall, there was a reasonable composition of programs analyzed that approximated the true proportions of current RDN pathways (CP: Coordinated Programs 23; DPD/DI: Didactic Program in Dietetics + Dietetic Internship: 83; GP: Future Graduate Programs 7; Other 1). No foreign education programs were included in this study.

Finally, the researcher is a program director of a Future Graduate Program and could introduce some unintentional personal bias, potentially during the focus groups or when interpreting the results of the study. The area of IPCP is of personal interest, and therefore it was important to use checks and balances along the research process to expand the sampling and interpretation of the data. Personal ethics and reliance on a strong network of expert consultants helped the study stay as objective as possible. Objective volunteer readers and faculty advisors reviewed the data to ensure objective analysis.

Recommendations for Future Research

In conclusion, this dissertation project integrated many important variables to address what becomes of the IPE efforts during early independent practice. The goals of effective educational concepts and accreditation standards for student performance at the entry-level

practice are met by the end of a pre-professional program. The direction of future research should aim at finding effective, long-term solutions to make the most of learning experiences and resources during training programs that promote and integrate foundational practice in interprofessional collaborations. Specifically, captured in this study, assessment tools and methods to effectively measure required competencies are recommended. Also, a deeper understanding of IPE benefits for practitioners related to how IPCP is practiced in the field by dietitians will help inform accrediting bodies and educators. For example, this study found that 68% of practitioners have dedicated space and time to engage in IP activities, while educators reported that they are burdened with many responsibilities and have competing priorities. These two stakeholder groups could operate more complementary in efforts to further IPCP.

If interprofessional collaborative practice is the ideal measure of quality education, the results of this study help inform educators and stakeholders about effective IPE activities and how training programs support the new practitioners in facing real workplace demands. The collectively applied theories in this study provided a strong basis for expectations that new RDNs will openly embrace IPCP and feel well prepared for what they encounter in the workplace. This assumption was validated through participant survey responses and then further elucidated through qualitative focus groups.

References

1. Barr H, Freeth D, Hammick M, Koppel I, Reeves S. The evidence base and recommendations for interprofessional education in health and social care. *Journal of Interprofessional Care*. 2006;20(1):75-78. doi:10.1080/13561820600556182
2. Blue A, Chesluk BJ, Conforti LN, Holmboe ES, Professions H. Assessment and Evaluation in Interprofessional Education Exploring the Field. *Journal of Allied Health*. 2015;44(2):73-82.
3. Rubin M, Cohen Konrad S, Nimmagadda J, Scheyett A, Dunn K. Social work and interprofessional education: integration, intersectionality, and institutional leadership. *Social Work Education*. 2018;37(1):17-33. doi:10.1080/02615479.2017.1363174
4. World Health Organization. *Framework for Action on Interprofessional Education and Collaborative Practice*.; 2010.
5. Institute of Medicine. *Educating for the Health Team*.; 1972.
6. Interprofessional Education Collaborative. *Core Competencies for Interprofessional Collaborative Practice: 2016 Update*.; 2016.
7. National Academies of Science Engineering and Medicine. *Strengthening the Connection Between Health Professions Education and Practice: Proceedings of a Join Workshop*.; 2019.
8. Visser CLF, Ket JCF, Croiset G, Kusrkar RA. Perceptions of residents, medical and nursing students about Interprofessional education: a systematic review of the quantitative and qualitative literature. *BMC Medical Education*. 2017;17(1):77-undefined. doi:10.1186/s12909-017-0909-0
9. Olson R, Bialocerkowski A. Interprofessional education in allied health: a systematic review medical education in review. *Medical Education*. 2014;48:236-246. doi:10.1111/medu.12290
10. Allvin R, Thompson C, Edelbring S. Assessment of interprofessional competence in undergraduate health professions education: Protocol for a systematic review of self-report instruments. *Systematic Reviews*. 2020;9(1). doi:10.1186/s13643-020-01394-7
11. Whyte S, Paradis E, Cartmill C, et al. Misalignments of purpose and power in an early Canadian interprofessional education initiative. *Advances in Health Sciences Education*. 2017;22(5). doi:10.1007/s10459-016-9746-x
12. Abu-Rish E, Kim S, Choe L, et al. Care Current trends in interprofessional education of health sciences students: A literature review: Current trends in interprofessional education of health sciences students: A literature review. *Journal of Interprofessional Care*. 2012;26(2):444-451. doi:10.3109/13561820.2012.715604
13. Reeves S, Suter Esther, Goldman Joanne, Martimianakis Tina, Chataisingh Carole, Dematto Dale. *A Scoping Review to Identify Organizational and Education Theories Relevant for Interprofessional Practice and Education*.; 2007. Accessed June 27, 2021. <https://www.researchgate.net/publication/237784416>
14. Eliot KA, L'Horsset AM, Gibson K, Petrosky S. Interprofessional education and collaborative practice in nutrition and dietetics 2020: An Update. *Journal of the Academy Nutrition and Dietetics*. 2021;121(4):637-646. doi:10.1016/j.jand.2020.08.010
15. Accreditation Council for Education in Nutrition and Dietetics. *ACEND Accreditation Standards for Nutrition and Dietetics Coordinated Programs*.; 2016.
16. Accreditation Council for Education in Nutrition and Dietetics. *Accreditation Standards for Graduate Degree Programs in Nutrition and Dietetics (FG)*.; 2019.

17. Academy of Nutrition and Dietetics. Academy mission, vision, and principles. Published 2017. Accessed June 27, 2021. <https://www.eatrightpro.org/media/press-releases/leadership-announcements/academy-announces-new-vision-mission-principles>
18. Border K, Endrizal C, Cecil M. Academy of Nutrition and Dietetics: Revised 2018 Standards of Professional Performance for Registered Dietitian Nutritionists (Competent, Proficient, and Expert) in Education of Nutrition and Dietetics Practitioners. *Journal of the Academy of Nutrition and Dietetics*. 2019;119(1):124-136.e29. doi:10.1016/j.jand.2018.10.014
19. Kicklighter JR, Dorner B, Hunter AM, et al. Visioning Report 2017: A Preferred Path Forward for the Nutrition and Dietetics Profession. *Journal of the Academy of Nutrition and Dietetics*. 2017;117(1):110-128. doi:10.1016/j.jand.2016.09.027
20. Miller G. The assessment of clinical skills/competence/performance. *Academic Medicine*. 1990;65(9):S63-S67. Accessed May 29, 2021. <http://winbev.pbworks.com/f/Assessment.pdf>
21. Barr H, Freeth D, Hammick M, Koppel I, Reeves S. *Evaluations of Interprofessional Education: A United Kingdom Review for Health and Social Care*.; 2000. Accessed January 6, 2021. file:///Users/alphapetro/Downloads/Barr-H.-FreethD.-Hammick-M.-Koppel-I.-Reeves-S.-2000-Evaluations-of-interprofessional-education.pdf
22. The IHI Triple Aim | IHI - Institute for Healthcare Improvement. Accessed July 31, 2021. <http://www.ihl.org/Engage/Initiatives/TripleAim/Pages/default.aspx>
23. National Health Expenditure Projections 2019–28. Published online 2020.
24. Affordable Care Act (ACA) - HealthCare.gov Glossary | HealthCare.gov. Accessed August 1, 2021. <https://www.healthcare.gov/glossary/affordable-care-act/>
25. Institute of Medicine (U.S.). Committee On Measuring The Impact Of Interprofessional Education On Collaborative Practice and Patient Outcomes. *Measuring the Impact of Interprofessional Education on Collaborative Practice and Patient Outcomes*. The National Academies Press; 2015.
26. Interprofessional Education Collaborative. About Us. Accessed August 1, 2021. <https://www.ipecollaborative.org/about-us>
27. Leander S, Maloney M, Ruebling I, Banks R. “The Power of Many Minds Working Together”: Qualitative Study of an Interprofessional Service-Learning Capstone Course. *Journal of Research in Interprofessional Practice and Education*. 2014;4.2. www.jripe.org
28. Salvati LA, Weber ZA, Trinh M, Rustem DR, Etelamaki CL. An assessment of interprofessional education in schools/colleges of pharmacy in the United States. *Currents in Pharmacy Teaching and Learning*. 2020;12(6):626-632. doi:10.1016/j.cptl.2020.01.030
29. Paradis E, Whitehead CR. Louder than words: Power and conflict in interprofessional education articles, 1954-2013. *Medical Education*. 2015;49(4):399-407. doi:10.1111/medu.12668
30. Walker LE, Cross M, Barnett T. Students’ experiences and perceptions of interprofessional education during rural placement: A mixed methods study. *Nurse Education Today*. 2019;75. doi:10.1016/j.nedt.2018.12.012
31. Stadick JL. The relationship between interprofessional education and health care professional’s attitudes towards teamwork and interprofessional collaborative competencies. *Journal of Interprofessional Education and Practice*. 2020;19. doi:10.1016/j.xjep.2020.100320

32. Eliot KA, Wilson M, Breitbach AP, Chushak-Polevska M. Incorporation of Interprofessional Education in Nutrition and Dietetics Education Programs. *Topics in Clinical Nutrition*. 2017;32(3):184-192. doi:10.1097/TIN.000000000000106
33. The Academy of Nutrition and Dietetics. Academy History. Accessed August 1, 2021. <https://www.eatrightpro.org/about-us/academy-vision-and-mission/academy-history>
34. About CDR - Commission on Dietetic Registration. Accessed August 1, 2021. <https://www.cdrnet.org/about>
35. Worsfold L, Grant BL, Barnhill GC. The Essential Practice Competencies for the Commission on Dietetic Registration's Credentialed Nutrition and Dietetics Practitioners. Published online 2015. doi:10.1016/j.jand.2015.03.027
36. Essential Practice Competencies for the Commission on Dietetic Registration's Credentialed Nutrition and Dietetics Practitioners.
37. Eliot K, Kolasa K. The Value in Interprofessional, Collaborative-Ready Nutrition and Dietetics Practitioners. *Journal of the Academy Nutrition and Dietetics*. 2015;115(10):1578-1588. doi:10.1016/j.jand.2015.03.025
38. Earland J, Gilchrist M, Mcfarland L, Harrison K. Dietetics students' perceptions and experiences of interprofessional education. *Journal of Human Nutrition and Dietetics*. 2011;24(2):135-143. doi:10.1111/j.1365-277X.2010.01141.x
39. Evans S, Ward C, Margerison C. Online interprofessional education in dietetic students. *Nutrition and Dietetics*. 2016;73(3):268-274. doi:10.1111/1747-0080.12235
40. Patton Z, Vernon M, Haymond K, Anglin J, Heboyan V, de Leo G. Evaluation of Interprofessional Education Implementation among Nutrition Program Directors in the United States. *Topics in Clinical Nutrition*. 2018;33(3):196-204. doi:10.1097/TIN.0000000000000143
41. Heyerdahl E, Ottesen M, Molin M, et al. Nutrition Students' Experiences of Interprofessional Learning in a Nursing Home. *Journal of Research in Interprofessional Practice & Education*. 2020;10(1). doi:10.22230/jripe.2020
42. Bacon R, Kellett J, Dart J, et al. A Consensus Model: Shifting assessment practices in dietetics tertiary education. *Nutrition and Dietetics*. 2018;75:418-430. doi:10.1111/1747-0080.12415
43. Cade JE, Eccles E, Hartwell H, Radford S, Douglas A, Milliner L. The making of a nutrition professional: the Association for Nutrition register. *Public Health Nutrition*. 2012;15(11):2102-2019. doi:10.1017/S1368980011003338
44. Christaldi J, Bodzio JR. Cultural competence and the global role of dietitians: A Haitian medical mission and inter-professional, service-learning nutrition course. *The Open Nutrition Journal*. 2015;9(Suppl 1-M5):35-42.
45. MacQuillan EL, Ford J, Baird K. Clinical Competence Assessed Using Simulation: Development of a Standardized Tool to Assess Nutrition-Focused Physical Exam Skill Competence for Registered Dietitian Nutritionists. *Journal of Nutrition Education and Behavior*. 2021;53(2):174-182. doi:10.1016/j.jneb.2020.10.014
46. MacQuillan E. Integrating competency-based dietetics education into traditional grading and scheduling schema: lessons from other health professions. *NDEP-Line*. May 2021:4-7.
47. Dreyfus SE, Dreyfus HL. *A Five-Stage Model of the Mental Activities Involved in Directed Skills Acquisition*.; 1980.
48. Peña A. The Dreyfus model of clinical problem-solving skills acquisition: a critical perspective. *Medical Education Online*. 2010;15(1). doi:<https://doi.org/10.3402/meo.v15i0.4846>

49. Olle Ten Cate TJ, Snell L, Carraccio C, Cate O ten. Medical competence: The interplay between individual ability and the health care environment. *Medical Teacher*. 2010;32(8):669-675. doi:10.3109/0142159X.2010.500897
50. Khan K, Ramachandran S. Conceptual framework for performance assessment: Competency, competence and performance in the context of assessments in healthcare- Deciphering the terminology. *Medical Teacher*. 2012;34(11):920-928. doi:10.3109/0142159X.2012.722707
51. Koemel NA, Shafieizadeh K, Farr BR. Career readiness in the dietetics curriculum. *Journal of the Academy Nutrition and Dietetics*. 2021;121(1):15-24. doi:10.1016/j.jand.2020.07.015
52. Petrizzo M, Block L, Olvet DM, et al. Implementation of an interprofessional nutrition workshop to integrate nutrition education into a preclinical medical school curriculum. *Journal of the American College of Nutrition*. 2021;40(2):111-118. doi:10.1080/07315724.2020.1737985
53. Costello M, Prelack K, Faller J, Huddleston J, Adly S, Doolin J. Student experiences of interprofessional simulation: Findings from a qualitative study. *Journal of Interprofessional Care*. 2018;32(1):95-97. doi:10.1080/13561820.2017.1356810
54. Mckenna L, Boyle M, Palermo C, Molloy E, Williams B, Brown T. Promoting interprofessional understandings through online learning: A qualitative examination. *Nursing and Health Sciences*. 2014;16(3):321-326. doi:10.1111/nhs.12105
55. O'Shea MC, Reeves NE, Bialocerkowski A, Cardell E. Using simulation-based learning to provide interprofessional education in diabetes to nutrition and dietetics and exercise physiology students through telehealth. *Advances in Simulation*. 2019;4(S1). doi:10.1186/s41077-019-0116-7
56. Murray B, Judge D, Morris T, Opsahl A. Interprofessional education: A disaster response simulation activity for military medics, nursing, & paramedic science students. Published online 2019. doi:10.1016/j.nepr.2019.08.004
57. Miles A, Friary P, Jackson B, Sekula J, Braakhuis A. Simulation-based dysphagia training: teaching interprofessional clinical reasoning in a hospital environment. *Dysphagia*. 2016;31:407-415. doi:10.1007/s00455-016-9691-0
58. Sevin AM, Hale KM, Brown N v, Mcauley JW. Instructional design and assessment. assessing interprofessional education collaborative competencies in service-learning course. *American Journal of Pharmaceutical Education*. 2016;80(2).
59. Dacey M, Murphy JI, Anderson DC, McCloskey WW. An interprofessional service-learning course: uniting students across educational levels and promoting patient-centered care. *Journal of Nursing Education*. Published online 2010. doi:10.3928/01484834-20100831-09
60. Darlow B, Coleman K, McKinlay E, et al. The positive impact of interprofessional education: A controlled trial to evaluate a program for health professional students Approaches to teaching and learning. *BMC Medical Education*. 2015;15(1):1-9. doi:10.1186/s12909-015-0385-3
61. Darlow B, Donovan S, Coleman K, et al. What makes an interprofessional education program meaningful to students? Findings from focus group interviews with students based in New Zealand. *Journal of Interprofessional Care*. 2016;30(3):355-361. doi:10.3109/13561820.2016.1141189
62. Tong B, St John M, Li E, Wilbur K. Could interprofessional education assessment in workplace learning be streamlined? *Journal of Interprofessional Education and Practice*. 2020;19. doi:10.1016/j.xjep.2020.100321
63. Williams B, Mccook F, Brown T, et al. Are undergraduate health care students “ready” for interprofessional learning? A cross-sectional attitudinal study. *The Internet Journal*

- of *Allied Health Sciences and Practice*. 2012;10(3). Accessed May 30, 2021. <http://ijahsp.nova.edu>
64. Whelan K, Thomas JE, Cooper S, et al. Interprofessional education in undergraduate healthcare programmes: the reaction of student dietitians. *Journal of Human Nutrition and Dietetics*. 2005;18:461-466.
 65. Eliot K, Breitbach A, Wilson M, Chushak M. Institutional readiness for interprofessional education among nutrition and dietetics and athletic training Education Programs. *Journal of Allied Health*. 2017;46(2):94-103.
 66. Lewis GR, Pole D, Linsenmeyer W, Rahman R, Briggs E, Eliot K. The relationship between interprofessional education experience and perceptions, values, and attitudes towards interprofessional collaboration in dietetics practice. *Journal of Interprofessional Education & Practice*. 2020;20:100346. doi:10.1016/j.xjep.2020.100346
 67. Mace KL, Welch Bacon CE. The future of health professions education: Considerations for competency-based education in athletic training. *Athletic Training Education Journal*. 2019;14(3):215-222. doi:10.4085/1403215
 68. Leach DC. A model for GME: shifting from process to outcomes. A progress report from the Accreditation Council for Graduate Medical Education. *Medical Education*. 2004;38(1):12-14. doi:10.1111/J.1365-2923.2004.01732.X
 69. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. National Academies Press (US); 2001. doi:10.17226/10027
 70. Barr H. Competent to collaborate: Towards a competency-based model for interprofessional education. *Journal of Interprofessional Care*. 1998;12(2):181-187. doi:10.3109/13561829809014104
 71. Gillan C, Lovrics E, Halpern E, Wiljer D, Harnett N. The evaluation of learner outcomes in interprofessional continuing education: A literature review and an analysis of survey instruments. *Medical Teacher*. 2011;33(9). doi:10.3109/0142159X.2011.587915
 72. Lapkin S, Levett-Jones T, Gilligan C. A systematic review of the effectiveness of interprofessional education in health professional programs. *Nurse Education Today*. 2013;33(2):90-102. doi:10.1016/J.NEDT.2011.11.006
 73. Davis A, Affenito S. Interprofessional education to create and sustain high-performance teams to support our transforming health care system and future educational model: how nutrition and dietetics can ``weigh-in''. *Journal of the Academy Nutrition and Dietetics*. 2017;117(12):1871-1877. doi:10.1016/j.jand.2016.10.021
 74. Kirkpatrick D. Great ideas revisited: Revisiting Kirkpatrick's four-level model. *Training and Development*. 1996;50(1):54-undefined.
 75. Freeth Della, Hammick Marilyn, Reeves Scott, Koppel Iva, Barr Hugh. Effective interprofessional education: development, delivery and evaluation. In: *Promoting Partnership for Health*. Blackwell Pub; 2005:206.
 76. Curran V, Sargeant J, Hollett A. Evaluation of an interprofessional continuing professional development initiative in primary health Care. Published online 2007. doi:10.1002/chp
 77. Gillan C, Wiljer D, Harnett N, Briggs K, Catton P. Changing stress while stressing change: The role of interprofessional education in mediating stress in the introduction of a transformative technology. <http://dx.doi.org/10.3109/13561820903550796>. 2010;24(6):710-721. doi:10.3109/13561820903550796

78. Reeves S, Zwarenstein M, Goldman J, et al. Interprofessional education: Effects on professional practice and health care outcomes. *Cochrane Database of Systematic Reviews*. 2008;(1). doi:10.1002/14651858.CD002213.PUB2
79. Schmitz C, Cullen M. *Evaluation of Interprofessional Education and Collaborative Practice: What Should I Consider When Selecting a Measurement Tool?*; 2015. Accessed May 29, 2021. <http://nexusipe.org/evaluating-ipecp>
80. The Canadian Interprofessional Health Collaborative (CIHC) Research & Evaluation Committee's Quantitative Tools Working Group. *An Inventory of Quantitative Tools Measuring Interprofessional Education and Collaborative Practice Outcomes*.; 2012.
81. About the Nexus | National Center for Interprofessional Practice and Education. Accessed August 4, 2021. <https://nexusipe.org/informing/about-nexus>
82. Canadian Interprofessional Health Collaborative (CIHC) framework | Office of Interprofessional Education - McGill University. Accessed August 4, 2021. <https://www.mcgill.ca/ipeoffice/ipe-curriculum/cihc-framework>
83. Norris J, Carpenter JG, Eaton J, et al. The development and validation of the Interprofessional Attitudes Scale: Assessing the interprofessional attitudes of students in the health professions. *Academic Medicine*. 2015;90(10):1394-1400. doi:10.1097/ACM.0000000000000764
84. Groessl JM, Vandenhouten CL. Examining students' attitudes and readiness for interprofessional education and practice. *Education Research International*. 2019;2019. doi:10.1155/2019/2153292
85. Frost JS, Hammer DP, Nunez LM, et al. The intersection of professionalism and interprofessional care: development and initial testing of the interprofessional professionalism assessment (IPA). *Journal of Interprofessional Care*. 2019;33(1):102-115. doi:10.1080/13561820.2018.1515733
86. Hinyard L, Toomey E, Eliot K, Breitbach A. Student perceptions of collaboration skills in an interprofessional context: development and initial validation of the self-assessed collaboration skills instrument. *Evaluation and the Health Professions*. 2019;42(4):450-472. doi:10.1177/0163278717752438
87. Valentine MA, Nembhard IM, Edmondson AC. Measuring teamwork in health care settings a review of survey instruments. *Medical Care*. 2015;53(4): e16-e30. doi:10.1097/MLR.0b013e31827feef6
88. Oates M, Davidson M. A critical appraisal of instruments to measure outcomes of interprofessional education - PubMed. *Medical Education*. 2015;49(4):386-398.
89. Havyer RDA, Wingo MT, Comfere NI, et al. Teamwork assessment in internal medicine: a systematic review of validity evidence and outcomes. *Journal of General Internal Medicine*. 2013;29(6):894-910. doi:10.1007/s11606-013-2686-8
90. Shoemaker SJ, Parchman ML, Kerwin Fuda K, et al. A review of instruments to measure interprofessional team-based primary care. *Journal of Interprofessional Care*. 2016;30(4):423-432. doi:10.3109/13561820.2016.1154023
91. Schmitz CC, Radosevich DM, Jardine P, Macdonald CJ, Trumpower D, Archibald D. The Interprofessional Collaborative Competency Attainment Survey (ICCAS): A replication validation study. *Journal of Interprofessional Care*. Published online 2016. doi:10.1080/13561820.2016.1233096
92. Dow AW, Diazgranados D, Mazmanian PE, Retchin SM. An exploratory study of an assessment tool derived from the competencies of the interprofessional education collaborative. *Journal of Interprofessional Care*. 2014;28(4):299-304. doi:10.3109/13561820.2014.891573

93. Lockeman KS, Dow AW, DiazGranados D, et al. Refinement of the IPEC Competency Self-Assessment survey: Results from a multi-institutional study. *Journal of Interprofessional Care*. 2016;30(6). doi:10.1080/13561820.2016.1220928
94. Lockeman KS, Dow AW, Randell AL. Validity evidence and use of the IPEC Competency Self-Assessment, Version 3. *Journal of Interprofessional Care*. 2019;35(1):107-113. doi:10.1080/13561820.2019.1699037
95. Keeley C. Conscious competence model and medicine. *Foot & Ankle Surgery: Techniques, Reports & Cases*. 2021;0(0):100053. doi:10.1016/J.FASTRC.2021.100053
96. The Stages of Learning: How You Become More Competent at Skills – Effectiviology. Accessed August 2, 2021. <https://effectiviology.com/the-stages-of-learning-how-you-slowly-become-more-competent-at-new-skills/>
97. Cannon HM, Feinstein AH, Friesen DP. Managing complexity: applying the conscious-competence model to experiential learning. *Developments in Business Simulations and Experiential Learning*. 2010;37:172-182.
98. Houldsworth A. Conscious competence in interprofessional learning in healthcare education. *Medical Education*. 2018;7(1). doi:10.15694/MEP.2018.0000039.1
99. Morell VW, Sharp PC, Crandall SJ. Creating student awareness to improve cultural competence: Creating the critical incident. *Medical Teacher*. 2002;24(5):532-534. doi:10.1080/0142159021000012577
100. Wilhelm JD. Working toward conscious competence: the power of inquiry for teachers and learners. *Voices from the Middle*. 2016;23(3):58-60.
101. Newman FM, Wehlage GG. *Successful School Restructuring: A Report to the Public and Educators.*; 1995.
102. Social psychology | Britannica. Accessed July 31, 2021. <https://www.britannica.com/science/social-psychology>
103. Intergroup Contact Theory: Past, Present, and Future | In-Mind. Accessed July 30, 2021. <https://www.in-mind.org/article/intergroup-contact-theory-past-present-and-future>
104. Rademaker F, de Boer A, Kupers E, Minnaert A. Applying the contact theory in inclusive education: a systematic review on the impact of contact and information on the social participation of students with disabilities. *Frontiers in Education* | www.frontiersin.org. 2020;5:602414. doi:10.3389/feduc.2020.602414
105. Hewstone M, Brown R. *Contact and Conflict in Intergroup Encounters*. (Hewstone M, Brown R, eds.). Basil Blackwell; 1986.
106. Mohaupt J, van Soeren M, Andrusyszyn MA, Macmillan K, Devlin-Cop S, Reeves S. Understanding interprofessional relationships by the use of contact theory. *Journal of Interprofessional Care*. Published online 2012. doi:10.3109/13561820.2012.673512
107. Michalec B, Schneider JM, Mackenzie M. Teaching empathy in an interprofessional setting with a focus on decategorization: Introducing I-Team. *Journal of Interprofessional Education and Practice*. Published online 2020. doi:10.1016/j.xjep.2020.100395
108. McGuire LE, Stewart AL, Akerson EK, Gloeckner JW. Developing an integrated interprofessional identity for collaborative practice: Qualitative evaluation of an undergraduate IPE course. *Journal of Interprofessional Education and Practice*. 2020;20. doi:10.1016/j.xjep.2020.100350
109. Pecukonis E. Interprofessional education: a theoretical orientation incorporating profession-centrism and social identity theory. *Journal of Law, Medicine, and Ethics*. 2014;42(s2):60-64. doi:10.1111/JLME.12189

110. What Is The Transformative Learning Theory? Accessed July 30, 2021. <https://www.wgu.edu/blog/what-transformative-learning-theory2007.html#close>
111. Dweck CS. Motivational processes affecting learning adaptive and maladaptive motivational patterns. *American Psychologist*. 1986;41(10):1040-1048.
112. Brewer ML, Flavell HL, Trede F, Smith M. A scoping review to understand “leadership” in interprofessional education and practice. *Journal of Interprofessional Care*. 2016;30(4):408-415. doi:10.3109/13561820.2016.1150260
113. Thompson N, Pascal J. Developing critically reflective practice. *Reflective Practice*. 2012;13(2):311-325. doi:10.1080/14623943.2012.657795
114. What Is Constructivism? Accessed July 31, 2021. <https://www.wgu.edu/blog/what-constructivism2005.html>
115. Osterman KF. *Bridging the Gap Using Constructivism and Reflective Practice to Bridge the Theory/Practice Gap*; 1998.
116. Experiential Learning Theory. Accessed July 31, 2021. <https://www.wgu.edu/blog/experiential-learning-theory2006.html>
117. Kolb David. *Experiential Learning: Experience as the Source of Learning and Development*. Prentice Hall; 1984. Accessed July 31, 2021. https://www.researchgate.net/publication/235701029_Experiential_Learning_Experience_As_The_Source_Of_Learning_And_Development
118. Miettinen R. The concept of experiential learning and John Dewey’s theory of reflective thought and action. *International Journal of Lifelong Education*. 2000;19(1):54-72. doi:10.1080/026013700293458
119. Krol M, Adimando A. Innovation center using Kolb’s experiential learning to educate nursing students about providing culturally and linguistically appropriate care. *Nursing Education Perspectives*. 2020;42(4):246-247. doi:10.1097/01.NEP.0000000000000650
120. Hodza-Beganovic R, Berggren P, Hugelius K, Edelbring S. Survey-based experiential learning as a new approach to strengthening non-technical skills in LMIC health care settings. *BMC Medical Education*. 2021;21(1). doi:10.1186/s12909-021-02619-6
121. Fewster-Thuente L, Batteson TJ. Kolb’s experiential learning theory as a theoretical underpinning for interprofessional education. *Journal of Allied Health*. 2018;47(1):1-8.
122. Walker JP, Rocconi LM. Experiential learning student surveys: indirect measures of student growth. *Research and Practice in Assessment*. 2021;16(1):21-undefined.
123. Seifert T. Understanding student motivation. *Educational Research*. 2004;46(2):137-149. doi:10.1080/0013188042000222421
124. Sulastri Akhmad V, Yusuf S, Safitri A, Juwita H. The relationship between self-efficacy and readiness of interprofessional education (IPE) among students at the faculty of medical and health sciences UIN Alauddin Makassar. *Journal of Health Science and Prevention*. 2019;ISSN 2459-919x:99-106. doi:10.29080/jhsp.v3i3S..297
125. Holthaus V, Sergakis G, Rohrig L, et al. The Impact of interprofessional simulation on dietetic student perception of communication, decision making, roles, and self-efficacy. *Topics in Clinical Nutrition*. 2015;30(2):127-142. doi:10.1097/TIN.0000000000000027
126. Illingworth P, Chelvanayagam S. Benefits of interprofessional education in health care. *Br J Nurs*. 2007;16(2):121-124. doi:10.12968/BJON.2007.16.2.22773
127. Gingras J, Aphramor L. Critical dietetics: A discussion paper. *Journal of Critical Dietetics*. 2014;2(1):2-11. doi:10.32920/cd.v2i1.759
128. Schoonenboom J, Johnson · R Burke. How to construct a mixed methods research Design. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*. 2017;69(Suppl 2):107-131. doi:10.1007/s11577-017-0454-1

129. Zoellner J, Harris J. Mixed-methods research in nutrition and dietetics. *Journal of the Academy Nutrition and Dietetics* 2017;117(5):683-697. doi:10.1016/j.jand.2017.01.018
130. dos Santos Marques I, Theiss LM, Johnson CY. Implementation of virtual focus groups for qualitative data collection in a global pandemic. *American Journal of Surgery*. 2021;221(5):918-922. doi:10.1016/j.amjsurg.2020.10.009
131. Hennink MM, Kaiser BN, Weber MB. What influences saturation? estimating sample sizes in focus group research. doi:10.1177/1049732318821692
132. Flynn R, Albrecht L, Scott SD. Two approaches to focus group data collection for qualitative health research: maximizing resources and data quality. doi:10.1177/1609406917750781
133. REDCap. Accessed July 4, 2021. <https://www.project-redcap.org/>
134. Roland D. Proposal of a linear rather than hierarchical evaluation of educational initiatives: the 7Is framework. *Journal of Educational Evaluation for Health Professions J Educ Eval Health Prof*. 2015;12:35. doi:10.3352/jeehp.2015.12.35
135. In J, Kang H, Kim JH, et al. Tips for troublesome sample-size calculation. *Korean Journal of Anesthesiology*. 2020;73(2):114-120. doi:10.4097/kja.19497
136. Bhalariao S, Kadam P. Sample size calculation. *International Journal of Ayurveda Research*. 2010;1(1):55. doi:10.4103/0974-7788.59946
137. Determining Sample Size: How many survey participants do you need? Accessed July 4, 2021. <https://www.cloudresearch.com/resources/guides/statistical-significance/determine-sample-size/>
138. Faul F, Erdfelder E, Lang A, Buchner A. G*Power3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavioral Research Methods*. 2007;39(2):175-191.
139. Kim MJ, Mallory C. *Statistics for Evidence-Based Practice in Nursing*. Jones and Bartlett Learning; 2017.
140. IDDSI - Home. Accessed May 20, 2022. <https://iddsi.org/>
141. Commission on Dietetic Registration. Essential practice competencies for the Commission on Dietetic Registration's Credentialed Nutrition and Dietetics Practitioners. Published 2020. Accessed June 27, 2021. https://admin.cdrnet.org/vault/2459/web/files/FINAL-CDR_Competency.pdf
142. National Academies of Practice. Meet the National Academies of Practice. Accessed May 22, 2022. <https://www.napractice.org/>
143. Kris-Etherton PM, Akabas SR, Bales CW, et al. The need to advance nutrition education in the training of health care professionals and recommended research to evaluate implementation and effectiveness. *Am J Clin Nutr*. 2014;99(Suppl):1153-1166S. doi:10.3945/ajcn.113.073502
144. McCabe CF, O'Brien-Combs A, Anderson OS. Cultural competency training and evaluation methods across dietetics education: A Narrative Review. *Journal of the Academy Nutrition and Dietetics*. 2020;120(7):1198-1209. doi:10.1016/j.jand.2020.01.014
145. Smeets H, Moser A, Sluijsmans D, Janssen-Brandt X, Merrienboer J van. The design of interprofessional performance assessments in undergraduate healthcare & social work education: a scoping review. *Health, Interprofessional Practice and Education*. 2021;4(2):2144. doi:10.7710/2641-1148.2144
146. National League for Nursing. *Guide to Effective Interprofessional Education Experiences in Nursing Education - Toolkit*.

Appendix A: IRB Approval



Office of Research and Sponsored Programs
1 UNF Drive
Jacksonville, FL 32224-2665
904-620-2455 FAX 904-620-2457
Equal Opportunity/Equal Access/Affirmative Action Institution

MEMORANDUM

DATE: December 13, 2021

TO: Ms. Stephanie Petrosky

VIA: Dr. Lauri Wright
Nutrition & Dietetics

FROM: Dr. Jennifer Wesely, Chairperson
On behalf of the UNF Institutional Review Board

RE: Declaration of Exempt Status for IRB#1817277-1
“Interprofessional education activities and new practitioner competence:
Implications for practice in nutrition and dietetics education.”

UNF IRB Number: 1817277-1
Exemption Date: 12-07-2021
Processed on behalf of UNF's IRB

This is to advise you that your above-referenced study has been reviewed on behalf of the UNF Institutional Review Board and has been declared “**Exempt**” from further IRB oversight under Exempt Category, **45 CFR 46.104(1) and (2)(iii)**. A “**limited IRB review**” was conducted to confirm the safeguards in place are sufficient to protect subjects’ privacy and to maintain confidentiality of the data. This exemption applies to your project in the form and content as submitted to the IRB for review.

According to the Code of Federal Regulations (45 CFR 46), once a study is declared “**Exempt**” from further IRB review, the study remains exempt for the life of the study. **No amendment** is required for an exempt study. However, if the PI determines that there has been a **substantive change** to the project that may result in alteration of the IRB review classification, the PI must notify the IRB and may be required to submit a new package in IRBNet.

Substantive changes could include, but may not be limited to,


- New knowledge that increases the risk level
- Use of methods that do not meet the exempt criteria
- Surveying or interview children or participating in activities being observed

- Change in the way identifiers are recorded so that participants can be identified
- Addition of an instrument, survey questions, or other change in instrumentation that could pose more than minimal risk
- Addition of vulnerable populations
- Under certain circumstances, addition of a funding source

Exempt studies do not expire and do not undergo continuing review. However, the PI is required to submit a Closure Report Form to the IRB once the study is completed.

Please be advised that any subject complaints, unanticipated problems, or adverse events that occur are to be reported to the IRB as soon as practicable, but no later than 3 business days following the occurrence. Please use the Event Report Form to submit information about such events.

Should you have questions regarding this determination, please contact the Research Integrity unit of the Office of Research and Sponsored Programs by emailing IRB@unf.edu or calling (904) 620-2455.

UNF IRB Number: 1817277-1 Exemption Date: 12-07-2021 Processed on behalf of UNF's IRB 

Appendix B: Recruitment Email (Practitioners)

Dear Colleague,

Congratulations on achieving the professional credentials of Registered Dietitian Nutritionist (RDN). You have been selected to participate in a research study that I am conducting, as part of my doctoral dissertation, to identify best practices related to interprofessional education (IPE) in nutrition and dietetics.

As a newly credentialed practitioner, you can provide valuable input and inform this important research. I hope you will consider the service to your profession in spending no longer than 15 minutes to complete a one-time electronic survey. <https://redcap.link/RD4IPE>

A large amount of literature confirms the benefits and value of IPE and has contributed to the accreditation standards for pre-professional programs. However, there is little information documented for our field related to the types of learning activities are provided to students to meet the expected student competencies. Also, long-term effects are still unknown. Following a [recent practice paper](#) published on this topic by the Academy of Nutrition and Dietetics, my research aim is to examine relationships between the various learning experiences to better understand the impact on newly credentialed practitioners. I would like to refine the findings into best practice recommendations to share with our profession.

Interested in participating?

Please complete this survey at <https://redcap.link/RD4IPE>

If you have any questions or would like to know more about this study, please contact:

Stephanie N. Petrosky, D.C.N.(c), M.H.A, RDN, LDN, FAND

Email:

Office:

Thank you in advance for your time and consideration.

Research Information:

Principle Investigator: Stephanie N. Petrosky, Candidate – Doctorate in Clinical Nutrition

Advisor: Lauri Wright, Ph.D., RDN, Department of Dietetics and Nutrition, Brooks College of Health, University of North Florida.

The project has been approved by the Institutional Review Board of University of North Florida (1817272-1). Please contact (904) 620-2457 for further information.

Appendix C: Practitioner Survey

Confidential

Page 1

Interprofessional education activities and new practitioner competence: Implications for practice in nutrition and dietetics education.

Please complete the survey below.

Thank you!

The following statements present the details of the research study information, and to move forward, you will be required to affirm YES to the consent question presented at the bottom of this page.

This research study is being conducted through the University of North Florida under the Department of Dietetics and Nutrition. The purpose of this study is to identify best practices related to interprofessional education (IPE) in nutrition and dietetics. Your participation is voluntary, and there is no penalty for refusal or withdrawal from the study. You may choose not to participate in this research without negatively impacting your relationship with the University of North Florida or the principal investigator or other program directors.

Eligible participants must be at least 18 years of age and have obtained the credentials of Registered Dietitian Nutritionist (RDN) within the past three years. We expect that participation in this study will take no more than 20 minutes of your time to complete this practice questionnaire. Your responses will be completely anonymous. Only authorized personnel (the approved research team) will have access to the responses collected.

This research involves no more than minimal risk to participants. With no foreseeable risks for joining, your participation in this study will provide valuable information about the educational process of nutrition and dietetics practitioners and may benefit others within the profession. There is no direct compensation being offered for completion of this survey.

If you have any questions or concerns about this project, please contact me or my faculty supervisor. You may print a copy of this consent information for your records before moving on to the screening questionnaire.

If you have questions about your rights as a research participant or if you would like to contact someone about a research-related injury, please contact the chair of the UNF Institutional Review board by calling (904) 620-2498 or emailing irb@unf.edu.

Thank you for your consideration.

If you have any questions or would like to know more about this study, please contact:

Principal Investigator: Stephanie N. Petrosky, D.C.N.(c), M.H.A, RDN, LDN, FAND

Email:

Office:

Faculty Advisor: Lauri Wright, Ph.D., RDN

Department of Dietetics and Nutrition, University of North Florida.

Email: lwright@unf.edu

Office: (904) 620-1436

Your informed consent is required in order to proceed with survey. Please select your choice from the options below.

- ☐ I consent to participate in this study.
☐ I do not wish to participate in this study.

2. Are you currently practicing as Registered Dietitian Nutritionist? (RDN)

- ☐ Yes
☐ No

Please enter your current age in whole numbers.
(Example format: 18 or 27)

What is your primary gender identity today?

- ☐ Male/man
☐ Female/woman
☐ Part time as one gender, part time as another
☐ Prefer not to answer

In whole years, how long have you been practicing since you passed the RDN exam for the first time?
(Example format: 1, 3 or 10)

Which type of pathway did you complete to qualify for the CDR registration exam for dietitians?

- ☐ Coordinated Program (CP)
- ☐ International Coordinated Program (ICP)
- ☐ Future Education Model Graduate Program (FG)
- ☐ Didactic Program in Dietetics (DPD) + Dietetic Internship (DI)
- ☐ Foreign Equivalency (FE)
- ☐ Individualized Supervised Practice Program (ISSP) + other qualifying degree or educational program
- ☐ Other not listed

In which state or US territory was your professional training program completed? Foreign programs are listed at the end of choices.

- ☐ AL|Alabama
- ☐ AK|Alaska
- ☐ AZ|Arizona
- ☐ AR|Arkansas
- ☐ CA|California
- ☐ CO|Colorado
- ☐ CT|Connecticut
- ☐ DE|Delaware
- ☐ DC|District of Columbia
- ☐ FL|Florida
- ☐ GA|Georgia
- ☐ GU|Guam
- ☐ HI|Hawaii
- ☐ ID|Idaho
- ☐ IL|Illinois
- ☐ IN|Indiana
- ☐ IA|Iowa
- ☐ KS|Kansas
- ☐ KY|Kentucky
- ☐ LA|Louisiana
- ☐ ME|Maine
- ☐ MD|Maryland
- ☐ MA|Massachusetts
- ☐ MI|Michigan
- ☐ MN|Minnesota
- ☐ MS|Mississippi
- ☐ MO|Missouri
- ☐ MT|Montana
- ☐ NE|Nebraska
- ☐ NV|Nevada
- ☐ NH|New Hampshire
- ☐ NJ|New Jersey
- ☐ NM|New Mexico
- ☐ NY|New York
- ☐ NC|North Carolina
- ☐ ND|North Dakota
- ☐ OH|Ohio
- ☐ OK|Oklahoma
- ☐ OR|Oregon
- ☐ PA|Pennsylvania
- ☐ PR|Puerto Rico
- ☐ RI|Rhode Island
- ☐ SC|South Carolina
- ☐ SD|South Dakota
- ☐ TN|Tennessee
- ☐ TX|Texas
- ☐ UT|Utah
- ☐ VT|Vermont
- ☐ VI|Virgin Islands, U.S.
- ☐ VA|Virginia
- ☐ WA|Washington
- ☐ WV|West Virginia
- ☐ WI|Wisconsin
- ☐ WY|Wyoming
- ☐ Foreign program outside of US

In which type of organization is your current primary position?

- ☐ For profit
- ☐ Not for profit (religious, arts, social, etc)
- ☐ Government
- ☐ Health care
- ☐ Education
- ☐ Other not listed

Which of the following best describes your current primary practice setting?

- ☐ Acute care inpatient
- ☐ Outpatient program
- ☐ Long-term care/rehab
- ☐ Community agency
- ☐ Public health
- ☐ School nutrition
- ☐ Government
- ☐ Higher education
- ☐ Business and industry
- ☐ Private practice or consulting
- ☐ Sales and marketing
- ☐ Media and communications
- ☐ Food service operations
- ☐ Other not listed

Specify Other:

For the remaining portions of this survey, please review the following definitions as the basis for your responses.

Interprofessional Education (IPE)

The most commonly accepted definition, adapted from the Centre for the Advancement of Interprofessional Education in the United Kingdom and the World Health Organization, states that it "occurs when two or more professions (students, residents and health workers) learn with, about, and from each other to enable effective collaboration and improve health outcomes."

Interprofessional Collaborative Practice (IPCP)

The World Health Organization explicitly articulated that the purpose of IPE is to enable collaboration with the intentional goal of improving health outcomes. IPCP "occurs when multiple health workers from different professional backgrounds provide comprehensive health services by working with patients, their families, caregivers, and communities to deliver the highest quality of care."

How would you describe your current level of competence related to interprofessional collaborative practice?

- ☐ Novice
☐ Advanced Beginner
☐ Proficient
☐ Expert

In your current work setting, do you have dedicated physical space (such as integrated meeting rooms and virtual platforms) or regular work activities which promote interprofessional collaboration?

- ☐ Yes
☐ No

In your current work setting, on average, how many interprofessional rounds or activities do you attend per month? Enter your response in whole number such as 0, 2, or 10.

Thinking about your pre-professional education program, how would you describe the emphasis of interprofessional learning activities in the curriculum?

- ☐ None at all
☐ Minimal, such as lectures only
☐ Moderate, with occasional interactive activities
☐ Foundational, main theme throughout program

During your pre-professional education program, which of the following interprofessional activities did you experience? (Check all that apply)

- ☐ Independent assignments
☐ Online case study
☐ Shared lecture
☐ Embedded coursework
☐ Interactive lab
☐ Simulation case with team
☐ Practicum experience
☐ Volunteer role
☐ Health fair or screening event
☐ Community outreach program
☐ None of these
☐ Other

Specify other:

Regarding the inter-professional activities you checked in the previous question, please rate on the scale of 0-9 how important these activities (overall) were for your professional development, where 0 = "not important at all to my professional development" and 9 = "extremely important to my professional development."

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Describe a few lines about the value of these activities to your current practice.

At this point in your career, select the option that corresponds with your level of agreement or disagreement on each item.

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I am able to choose communication tools and techniques that facilitate effective team interactions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to place the interests of patients at the center of interprofessional health care delivery.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to engage other health professionals in shared problem-solving appropriate to the specific care situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to respect the privacy of patients while maintaining confidentiality in the delivery of team-based care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to inform care decisions by integrating the knowledge and experience of other professions appropriate to the clinical situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to embrace the diversity that characterizes the health care team.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to apply leadership practices that support effective collaborative practice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to respect the cultures and values of other health professions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to engage other health professionals to constructively manage disagreements about patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to use strategies that improve the effectiveness of interprofessional teamwork and team-based care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I am able to demonstrate high standards of ethical conduct in my contributions to team-based care.

☐☐☐☐☐

I am able to use available evidence to inform effective teamwork and team-based practices.

☐☐☐☐☐

I am able to act with honesty and integrity in relationships with other team members.

☐☐☐☐☐

I am able to understand the responsibilities and expertise of other health professions.

☐☐☐☐☐

I am able to maintain competence in my own profession appropriate to my level of training.

☐☐☐☐☐

My pre-professional education program effectively prepared me for interprofessional collaborative practice.

☐☐☐☐☐

I will continue to seek out experiences in interprofessional education as an RDN.

☐☐☐☐☐

Thinking about your current practice, please select the rating that best describes how confident you feel about collaborative practice with the following health professionals:

	Not applicable to my practice	No confidence	Minimal confidence	Neutral or unsure	Moderate confidence	High confidence
Case manager	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Behavioral health provider	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dental practitioner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercise specialist or trainer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nurse or nurse specialist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nurse practitioner (ARNP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Optometrist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pharmacist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physician	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physician assistant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical therapist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Speech language pathologist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Looking back now on your pre-professional program, what would you recommend, if anything, be added to your learning experiences to better prepare you for interprofessional collaborative practice?

Appendix D: Recruitment Flyer (Practitioners)



Quick Survey:
A Dietitian's Perspective on Interprofessional Education

Help identify best practices in interprofessional education for nutrition and dietetics.

All active RDN practitioners are invited to participate.

We need your input – please share this survey with others.

One-time <15-minute electronic survey



Scan or click to take the survey

For Study Information Contact:
Principle Investigator: Stephanie N. Petrosky, D.C.N. (c), MHA, RDN, FAND
spetrosky@nova.edu | Advisor: Lauri Wright, Ph.D., RDN, Chair, Department of Dietetics and Nutrition, University of North Florida.
The project has been approved by the Institutional Review Board of University of North Florida (IRB 1817277-1).
Please contact (904) 620-2457 for further information.

Appendix E: Recruitment Email (Program Directors)

Dear Program Director,

I am contacting you to ask that you please consider participating in a qualitative research study that I am conducting, as part of my doctoral dissertation, to identify best practices related to interprofessional education (IPE) in nutrition and dietetics.

As an educator of an integral and complete training program leading to the eligibility of graduates to take the registration examination for dietitians, you can provide valuable input and inform this important research.

A large amount of literature confirms the benefits and value of IPE and has contributed to the accreditation standards for pre-professional programs. However, there is little information documented for our field related to the types of learning activities are provided to students to meet the expected student competencies. Also, long-term effects are still unknown. Following a [recent practice paper](#) published on this topic by the Academy of Nutrition and Dietetics, my research aim is to examine relationships between the various learning experiences to better understand the impact on newly credentialed practitioners. I would like to refine the findings into best practice recommendations to share with all educators.

Understanding and cataloging your experiences as a leader in the field of nutrition and dietetics education will help this study move forward. I am currently recruiting participants for small focus groups by Zoom. Your time will be limited to no more than 90 minutes, and those who complete the focus groups will be compensated with a small \$20 gift card.

Interested in participating?

Please complete this query form <https://redcap.link/IPEPD2022>

If you have any questions or would like to know more about this study, please contact:

Stephanie N. Petrosky, D.C.N.(c), M.H.A, RDN, LDN, FAND

Email: spetrosky@nova.edu

Office: (954) 262-1597

Thank you in advance for your time and consideration.

Research Information:

Principle Investigator: Stephanie N. Petrosky, Candidate – Doctorate in Clinical Nutrition

Advisor: Lauri Wright, Ph.D., RDN, Department of Dietetics and Nutrition, Brooks College of Health, University of North Florida.

The project has been approved by the Institutional Review Board of University of North Florida (1817277-1). Please contact (904) 620-2457 for further information.

Appendix F: Focus Group Interview Guide

Sample Interview Guide

Project Title: The relationship between interprofessional education activities and new practitioner competence: Implications for practice in nutrition and dietetics education.

Research Information:

Hi, my name is Stephanie Petrosky, and I am a doctoral student at the University of North Florida. I'm also an educator and a program director, so I do truly understand the challenge it took to be here.

The purpose of this group is to gather information about current activities in your programs regarding interprofessional education and collaborative practice. Specifically, I will ask questions about the nature of the activities and how you evaluate your students' competencies in this area.

The format of the interaction today is more conversational in nature. The information shared will be correlated with quantitative survey data from early RDN practitioners. Please be as open and honest as possible. You may notice me taking notes while I facilitate the session.

You were assigned a generic name to facilitate privacy and confidentiality of this forum. Please refer to identifier when addressing others, even if by some chance you may know someone in this group.

This session will be recorded. By remaining present, you are giving permission to be recorded. All personal information will remain confidential with me as the principal investigator.

I'd like to also mention that at the conclusion, all participants will be provided with an Amazon gift card made possible by a research stipend from the University of North Florida Department of Nutrition and Dietetics.

Before we begin, what questions may I answer for you?

Session Opening

2. I'm sharing the technical definitions of IPE and IPCP. Please review them.
3. In what ways have you been ***trained*** as an educator to prepare or deliver IPE activities?
4. How do you ***personally practice*** these concepts?

Key Questions

5. I'm displaying a summary of various ACEND competencies related to IPE. Think about your program for a minute and answer the next few questions for the specific accreditation standards that you cover. ***What IPE activities*** do you perform in your program?
6. How do you ***measure the student outcomes***?
7. Which ***other professions*** have you worked with to develop or deliver an IPE activity for your nutrition and dietetics students?
8. What are some of the ***outcomes*** that you measured in this activity?
9. Are there any ***other activities*** that you can think of?
10. How effectively do these activities ***meet the intention*** of the standards?
11. Compared with that last response, how effectively do the activities ***prepare future RDN practitioners***?

Closing Questions

12. Finally, let's shift to talk about the *potential gaps*. If you could design the ideal situation of promoting IPE in nutrition and dietetics, what would that look like?
13. What are some *limitations* to the organization's readiness to support IPE activities?
14. What are the *promoters* or ways that your organization shows readiness for IPE?
15. Are there any *other recommendations* for best practices that you can suggest improving upon the current state of IPE in nutrition and dietetics?

I'd like to personally thank you again for taking the time to be with us today. I've learned so much from your comments, and you all have provided a strong basis for my research.