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Preparing Future Dietitians for Interprofessional Collaboration: Employing an Evidence-Based Instructional Design Approach to Solve the Wicked Problem of Interprofessional Education

by

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A dissertation

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Committee Approval

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Dedication

To Johann Wolfgang von Goethe, who fueled my motivation with his words of wisdom, “Knowing is not enough; we must apply. Willing is not enough; we must do.”

Acknowledgment

This work would not have been possible without the support of my loving husband, who patiently allowed me to embrace my obsession with lifelong learning. My gratitude to all those who participated in the focus groups and shared their insights with me on how to optimize learning for future dietitians. Last, but not least, my sincere appreciation for my Committee Chair, Dr. John Curry, Graduate Faculty Representative Professor Paula Phelps, and the committee members—Drs. David Coffland, Barb Mason, and Allisha Weeden. Thanks for your time, guidance, and willingness to share your expertise.

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Terminology, Abbreviations, and Acronyms

Academy of Nutrition and Dietetics (Academy): The United States. professional organization for registered dietitian nutritionists and students (Academy of Nutrition and Dietetics, n.d.-a).

Accreditation Council for Education in Nutrition and Dietetics (ACEND): The accrediting board for nutrition and dietetics programs educating students to be future dietitians (ACEND, 2016a).

Analysis, Design, Development, Implementation, and Evaluation (ADDIE): Instructional design methodology for creating and developing educational and training programs (Morrison et al., 2013).

Commission on Dietetic Registration (CDR): National credentialing authority for dietitians practicing in the United States (CDR, 2021c).

Competency-based education (CBE): Curriculum guided by the student's ability to master the skills, abilities and knowledge (competencies) required for the practice of dietetics. (ACEND, 2016b)

Competencies for Registered Dietitian Nutritionists (CRDN): The knowledge, skill, judgement, and attitude required for a RDN to practice dietetics successfully and efficiently. (CDR, 2021b)

Continuing Professional Education (CPE): Mandated professional education products and programming required to renew registration as an RDN. (CDR, 2021c).

Coordinated Program (CP): An ACEND accredited United States-based college or university program that includes a dietetic internship concurrently with the baccalaureate degree (ACEND, 2016a).

Dietetics Didactic Program (DPD): An ACEND accredited four-year academic program coupled with a one-year dietetic internship (ACEND, 2016a).

Dietetic Internship (DI): A post baccalaureate degree program that admits only individuals who have a verification statement from a DPD or Foreign Dietitian Education program (FDE) and have earned at least a baccalaureate degree (ACEND, 2016a).

Foreign Dietitian Education program (FDE): Educational program that meets ACEND®'s standards tailored based on the needs of the host country; graduates may not be eligible to practice in the United States. (ACEND, 2016b)

Future Education Model (FEM): ACEND pilot education programs evaluating new graduate competencies and training for becoming an RDN (ACEND, 2016b).

Ill-structured problem: Instructional design problem "whose structure lacks definition in some respect" (Simon, 1973, p. 181).

Interprofessional Education (IPE): The exposure of students from diverse health profession programs to the types of cross-discipline collaborations, communication, and teamwork required in practice settings (Olson & Bialocerkowski, 2014).

Interprofessional Education Iterative Color Wheel (Color Wheel): Concept map depicting the complex matrix underlying IPE composed of seven components—professions, antecedents, consequences, empirical referents, facilitators, interprofessional learning, and challenges (Olenick et al., 2010).

Interprofessional Practice (IPP): Working with health care providers from different professions as well as the patient/family/caregiver to collaborate on the delivery of clinical care (Ketcherside et al., 2017).

Knowledge for Registered Dietitian Nutritionists (KRDN): The knowledge requirements that ACEND-accredited programs must include in the nutrition and dietetics curriculum (ACEND, 2016b)

Participatory Action Research and Systems Evaluation for Interprofessional Education (PARSE-IPE): Conceptual framework that marries three theoretical models—Participatory Action Research Spiral (qualitative research), Systems Model of Evaluation (instructional design), and Iterative Color Wheel (interprofessional education).

Participatory Action Research Spiral (Spiral): Illustration of cyclical process of participatory action research, depicting continual engagement in the steps of planning, acting, observing, and reflecting (Kemmis et al., 2014).

Preceptor: A practicing RDN who agrees to mentor and supervise dietetic students/interns as part of a supervised practice experience/dietetic internship. (Academy of Nutrition and Dietetics, n.d.).

Instructional Design Systems Model of Evaluation (Systems Model): Graphic detailing the myriad of factors that must be evaluated when designing and evaluating instruction. (Sleezer et al., 2014).

Scope of practice (SOP): Range of roles, activities, and regulations within which nutrition and dietetics practitioners perform. (Academy of Nutrition and Dietetics, n.d.-b)

Wicked problem: Socially complex challenges for which solutions are elusive (Rittel & Webber, 1973; Skaburskis, 2008).

Health Care Professions and Acronyms

Doctor of osteopathic medicine (DO)

Medical doctor, also referred to as physician (MD)

Nurse practitioner (NP)

Occupational therapist (OT)

Physical therapist (PT)

Physician assistant (PA)

Registered dietitian nutritionist (RDN)

Registered nurses (RN)

Primary care physician (PCP)

Speech language pathologist, also referred to as speech therapist (SLP)

Preparing Future Dietitians for Interprofessional Collaboration: Employing an Evidence-Based Instructional Design Approach to Solve the Wicked Problem of Interprofessional Education

Dissertation Abstract—Idaho State University (2021)

In today's health care arena, registered dietitian nutritionists (RDNs) must work collaboratively as members of interprofessional practice teams. The Accreditation Council for Education in Nutrition and Dietetics, therefore, mandates the inclusion of interprofessional education (IPE) experiences for nutrition and dietetic students. IPE is the exposure of students from disparate health professions to the types of cross-discipline collaborations, communication, and teamwork required for interprofessional practice. Despite the numerous proven benefits of IPE experiences, sustainability has been problematic. This resulted in IPE being labeled as a wicked problem. Several researchers suggest that a potential reason for the failures of IPE is the lack of evidence-based approaches employed to develop these student experiences. The literature contains no reports of evidence-based, instructional design-driven, IPE learning needs assessments for nutrition and dietetics students. Of note, the phenomenon of wicked problems parallels the ill-structured instructional design problem. This evaluation study employed an evidence-based, instructional design, complex needs assessment protocol to gather the IPE learning needs of nutrition and dietetic students. Based on those findings, the potential impact of the 2024 masters-preparation requirement to become an RDN on those learning needs was explored. The conceptual framework for the study was the Participatory Action Research and Systems Evaluation for Interprofessional Education (PARSE-IPE). PARSE-IPE marries concepts from three domains—participatory action

research, instructional design, and interprofessional education. The findings provide program directors and faculty with actionable recommendations for developing sustainable IPE activities for dietetic students.

Key words: interprofessional education, interprofessional collaboration, dietitian, dietetics, nutrition

Chapter I: Introduction

In today's health care arena, clinicians from disparate professions work in clinical care teams—referred to as interprofessional practice (IPP). Community and food service management practice areas also require dietitians to work closely with professionals from other fields. In the clinical setting, IPP enables patient-centered care by embracing a spirit of teamwork (Flood et al., 2019a; Ketcherside et al., 2017). Depending upon the needs of a patient, members of these interprofessional teams might include physicians, physician assistants, nurses, pharmacists, social workers, dietitians, physical therapists, occupational therapists, respiratory care professionals, counselors, dentists, and emergency medical service personnel (Olenick et al., 2010). Registered dietitian nutritionists (RDNs) may be part of a clinical team caring for patients with cardiovascular disease, diabetes, food allergies, and kidney disease (Kowtha et al., 2019). A survey of 183 program directors of nutrition and dietetics education programs reported that the most common collaborators for RDNs included nurses, pharmacists, speech pathologists, and social workers (Patton et al., 2018). Demonstrating the essentiality of dietitians on interprofessional teams, during the spring 2020 peak of the coronavirus (COVID) pandemic in New York City, Mayor de Blasio reported that the core COVID health care team included doctors, nurses, respiratory therapists, pharmacists, and dietitians (Malone et al., 2020).

Interprofessional education (IPE) exposes students from diverse health profession programs to the types of cross-discipline collaborations, communication, and teamwork required in practice settings (Olson & Bialocerkowski, 2014). The importance of IPE in preparing health profession students for their roles as clinical providers is emphasized on

an international level (Bianchi, 2018; Farnsworth et al., 2015; Hammick et al., 2007; O'Keefe & Ward, 2018; Paterson et al., 2007). Extensive evidence demonstrates that educating health students on interprofessional teamwork yields improvements in patient care, outcomes, and satisfaction levels, as well as health care provider recruitment, satisfaction, and retention (Farnsworth et al., 2015; Hammick et al., 2007; Khalili et al., 2013). Table 1 highlights the benefits of IPE.

Table 1

Benefits of Interprofessional Education

Source	Benefit
Farnsworth et al., 2015	• Promotes appropriate use of specialist clinical resources. • Improves health outcomes for people with chronic diseases. • Decreases patient clinical errors, complications, mortality, and hospital admissions. • Reduces staff turnover.
Hammick et al., 2007	• Improves attitudes about working collaboratively with other health professionals. • Promotes acquisition of interprofessional collaboration knowledge and skills. • Allows for transfer of learnings into practice settings. • Improves patient health and well-being.
Khalili et al., 2013	• Enhances interprofessional collaboration. • Improves health provider satisfaction, recruitment, and retention. • Increases client satisfaction and improves clinical outcomes. • Yields cost savings and management efficiencies.
Olenick et al., 2010	• Helps address gaps in workforce shortages. • Promotes collaboration and highly integrated teamwork that are essential to patient safety and quality of care. • Encourages coordinated teamwork and communication.

A variety of IPE efforts have been piloted and praised for effectiveness; however, internal and external factors impacted their long-term viability (Baldwin, 2007; +Farnsworth et al., 2015; Hammick et al., 2007; Smith et al., 2015). The sustainability of

IPE experiences is thus problematic (Olenick et al., 2010; Rojas, 2018; Varpio et al., 2017). Olson and Bialocerkowski (2014) posit that educational programs for the health professions and IPE are in an epistemological row—the theoretical foundations of health sciences are clashing with the learning theories underlying IPE. Other researchers suggest that a potential reason for the failures of IPE is the lack of evidence-based approaches in the development process (Baldwin, 2007; Hutchings et al., 2013; Paradis & Reeves, 2013). In an extensive meta-analysis of the design of IPE experiences (100,488 articles, 40-year period, 1970-2010), the authors concluded, "Particularly important in this work is the use of rigorous research designs, framed by theoretical perspectives" (Paradis & Reeves, 2013, p. 121). Hutchings et al. (2013) echo this sentiment.

The field of instructional design offers the evidence-based approach advocated by Paradis and Reeve (2013). An essential initial step in the instructional design process is compiling and analyzing learning needs (Kemp & Morrison, 2013; Sleezer et al., 2014). Though an extensive number of articles have been published on IPE, there are few peer-reviewed reports on the findings of IPE learning needs assessments. Wilson and Hagler (2015) explain that in academia, learning needs are typically based on "a preset curriculum, or course of study." Kember (1998) notes that the utilization of instructional design in the education setting is limited. Loversidge and Demb (2014, p. 1469) profess that "Nurses and physicians comprise the dominant dyad in health care, and therefore nursing and medical faculty are key in guiding future IPE approaches."

Research Questions

The research questions that were investigated are: (a) what are the interprofessional learning needs of nutrition and dietetic students and (b) how does the

2024 master-prepared requirement impact the interprofessional learning needs of nutrition and dietetic students? The implementation of a novel conceptual framework aimed at solving the ill-structured problem posed by interprofessional education was also assessed.

Significance of Research

The Accreditation Council for Education in Nutrition and Dietetics (ACEND), the national accrediting board for United States-based nutrition and dietetics programs, mandates the inclusion of IPE. Yet only four studies offered insights into the IPE learning needs of nutrition and dietetic students (Baerg et al., 2012; Karamat et al., 2018; Maree et al., 2017; Patton et al., 2018).

None of the studies used an evidence-based instructional design process; however, Maree et al. (2017) utilized a methodology comparable to the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) framework (Levac et al, 2015). Also, only one of the studies (including Maree et al., 2017) engaged a full cohort of IPE stakeholders; specifically, students, faculty, practitioners, health care administrators, and patients. Baerg et al. (2012) surveyed many of the stakeholder groups (11 health professions and educators) but did not include health care administrators or patients in their sample. Dissemination of the findings of this study will thus provide an actionable source of information for nutrition and dietetics faculty and program directors. Table 2 provides an overview of those studies.

Table 2

Studies on the IPE Learning Needs of Nutrition and Dietetic Students

Author and Year	Design Process	Stakeholders Engaged	Findings on IPE Learning Needs: Core Concepts
Baerg et al., 2012	None	• Online survey (n=486) • Students, practitioners, administrators in health professions (dietetics = 42) • Experiences, knowledge of, interest in, barriers to training	• Interprofessional collaboration models • Leadership styles • Team stages • Conflict management
Karamat et al., 2018	None	• N=74 • Dietetic students • Other health profession students	• Values and ethics • Roles and responsibilities • Interprofessional communication • Teamwork and team-based care
Maree et al., 2017	Knowledge to action framework	• N=7 health professions faculty • Document analysis • Accreditation requirements	• Teamwork and communication • Community health and health literacy • Interprofessional health care research
Patton et al., 2018	None	• N=183 program directors of nutrition and dietetics education programs	• Ethics and communication • Roles and responsibilities • Team and teamwork

Also, of note, in the early 2000s, the Academy of Nutrition and Dietetics (Academy), the professional organization for RDNs, announced evidence-based practice as an organizational priority (Academy of Nutrition and Dietetics, n.d.a; Thorpe, 2002). The ability to leverage instructional science and design principles in this investigation is thus supportive of this organizational priority. A 2018 survey of 2,000-plus faculty members revealed that about 75% of them are not aware of the value of working with instructional designers (Lederman, 2018). The study's protocol will introduce educators to the evidence-based field of instructional design.

Finally, effective January 2024, a minimum of a master's degree will be required to take the credentialing exam to become a dietitian. Thus, an impending shift in the IPE learning needs of nutrition and dietetics students is emerging. After compiling the IPE

learning needs of nutrition and dietetic students, this evaluation study will explore if the needs differ for undergraduate and graduate students.

Delimitations, Assumptions, and Limitations

To enhance the education of future dietitians, a qualitative, cross-sectional study evaluated the interprofessional learning needs of nutrition and dietetic students. Data were collected through a series of online focus groups during the summer of 2021. A convenience sample of 41 participants was recruited. The study sample was primarily composed of Caucasian females and individuals who hailed from the northwestern United States. The findings, thus, represent the views of a nondiverse group of stakeholders at one point in time. The lack of diversity among the participants impedes the transferability of the findings.

A primary assumption was that the participants were knowledgeable about the study topic and effectively communicated their insights. The recruitment materials and consent process required participants to confirm that they were familiar with the constructs of interprofessional education and/or practice and had IPE/IPP experiences. It was assumed that participants answered questions honestly and factually. To encourage such responses, all participant data was de-identified and the research protocol employed strict confidentiality procedures.

The interprofessional learning needs of collaborating disciplines were not explored. In addition, the focus group discussions on evaluation tools only explored preferred assessment modalities. Though it was discovered that many tools collected information on both student learning and execution of the IPE activity, specific factors related to student learning were not investigated. For example, do the preferred tools

explore assessment factors such as modifications of attitudes and perceptions, acquisition of knowledge and skills, behavioral change, and anticipated patient care improvements? Furthermore, actual development, implementation, and execution of an interprofessional education program was beyond the scope. Implementation and execution strategies, however, were investigated during the focus groups.

When interpreting the findings, the qualitative nature of the study must be considered. The study evaluated the opinions of various stakeholders and does not offer quantifiable generalizations. Participants were self-selected and represented a small nonrandom sample of stakeholders. The risk of proxy bias may exist due to the small number of participants and the use of incentives to encourage participation. The utilization of online focus groups may have restricted individuals with lower levels of computer literacy or restricted access to the required technology to volunteer for the study. This may have contributed to the failure to meet recruitment goals for the patients/caregivers/family members focus group. A risk of qualitative methodologies is also the introduction of personal bias; controls implemented included perspectival triangulation and member checking.

Chapter II: Literature Review

The first known interprofessional education (IPE) programs date to the late 1940s (Baldwin, 2007). Across the next eight decades, a variety of efforts were piloted but a range of barriers prevented their sustainability. This literature review focused on peer-reviewed publications about interprofessional education experiences and the IPE learning needs of nutrition and dietetics students. The review also includes a look at the employment of a Complex Needs Assessment and action research to approach the wicked problem of IPE. Finally, the emerging research need is presented.

The Phenomenon of Wicked Problems

Rittel coined the phrase "wicked problems" to describe socially complex challenges for which solutions are elusive (Rittel & Webber, 1973; Skaburskis, 2008). The term is commonly used to identify emotionally charged public policy issues such as where to locate a new highway, revisions to school curricula, or penalties for various criminal offenses (Rittel & Webber, 1973). To further define the concept of wicked problems, Shafritz and Hyde (2012) attribute the following quote to Rittel, "We are calling them 'wicked,' not because [they] are ethically deplorable. We use the term 'wicked' in a meaning akin to that of 'malignant' (in contrast to 'benign') or 'vicious' (like a circle) or 'tricky' (like a leprechaun) or aggressive (like a lion, in contrast to the docility of a lamb)." Table 3 highlights the attributes of wicked problems.

Finding solutions to wicked problems is challenging (Rittel & Webber, 1973; Skaburskis, 2008). Resolution is messy because of a complex web of competing factors and stakeholders with divergent views invested in the solution (Skaburskis, 2008). Clear criteria for a correct solution do not readily precipitate (Skaburskis, 2008). Wicked

problems may mandate that the instructional designer consider potential solutions and navigate backward to search for the

Table 3

Ten Attributes of Wicked Problems

1.	There is no definite formulation of the problem. The problem is stuck in a permanent feedback loop with its environment.
2.	There are no stopping rules. The logic inherent in the problem does not tell you when to stop the inquiry.
3.	There are no criteria for correctness. There is nothing in the problem to say how the solution should be judged.
4.	There is no immediate test of the quality of the solution.
5.	There is no ultimate test of a solution.
6.	Once committed to a plan of action, change is consequential. You can't make consequences not happen.
7.	There is no list of permissible operations.
8.	There is no well-defined solution. You either have many solutions or none. The probability that a wicked problem has one solution is null.
9.	Every wicked problem is unique.
10.	The problem solver has no right to be wrong.

SOURCE: Skaburskis, 2008

problem (Skaburskis, 2008). Once a solution has been crafted, the ability to immediately test the quality and efficacy of the approach may not be feasible (Skaburskis, 2008). Finally, ongoing revisions to the solutions are a given (Skaburskis, 2008). Thus, an absolute solution is not truly attainable (Skaburskis, 2008).

Interprofessional Education as a Wicked Problem

Varpio et al. (2017) suggest that the characteristics of IPE mirror those of wicked problems. The wicked characteristics of IPE are characterized as "a set of challenges that are socially messy and defy commonly agreed-upon problem statements" (Varpio et al., 2017, p. 357). Furthermore, the wickedness of IPE is exposed, according to Vlarpio et al. (2017), by the inability to reach a consensus on the underlying reasons for the successes and failures of these interprofessional initiatives.

Challenges of Compiling IPE Learning Needs of Health Profession Students

Compilation of the learning needs of health professions students is a persistent challenge for educators (Baldwin, 2007; Englander, et al., 2013; O'Keefe & Ward, 2018; Smith et al., 2015; Whyte et al., 2017). Several factors complicate the scenario including disparate accreditation requirements, struggles to establish interprofessional teaching collaborations, conflicting practice environment norms, social and cultural phenomenon, and inadequate resource allocation. These elements create a chasm that traps IPE learners in the silos, which complicates the process of defining overlapping and distinct needs for heterogenous academic programs and student populations. Table 4 summarizes barriers to sustainable IPE programs.

Table 4

Barriers to Sustainable IPE Programs

Internal Factors	External Factors
• Inadequate resource allocation • Turf-guarding: Struggles to form interprofessional teaching collaborations • Administrative resistance to new approaches • No dedicated group of IPE champions • Lack of long-term commitment to IPE experiences • Failure to employ an evidence-based model to design IPE experiences	• Accreditation requirements • Limitations of traditional, linear curricula models • Conflicting practice norms of different health professions • Social and cultural dynamics among health professionals • Mixed practice models • Concepts difficult to understand and implement in the clinical setting

Accreditation Requirements. Curricula requirements enforced by external accrediting bodies are an obstacle for IPE initiatives (Baldwin, 2007; O'Keefe & Ward, 2018; Shakhman et al., 2020). Baldwin (2007) highlights a lack of adequate time for truly robust IPE experiences because of the rigid and "insular" accreditation requirements. O'Keefe and Ward (2018) comment that the "specific requirements set by individual disciplines and/or professional bodies" are a barrier to implementing IPE into health professions curricula.

Interprofessional Teaching Collaborations. Paterson et al. (2007) identified different "cultural beliefs and attitudes" across the health disciplines as a barrier to IPE. This sentiment was echoed by Shakhman et al. (2020). Disparities in definitions of "competency, for example, further complicates the dynamics of these interprofessional collaborations (Smith et al., 2015). Baldwin (2007, p. 32) reflects on the resistance of faculty to interprofessional education: "Attempts to promote such efforts seem to meet overwhelming barriers of disciplinary territoriality and systems inertia. As with the mythical Sisyphus, each forward push seems to end with a return to the point of origin, with little tangible evidence of impact or permanence. As a result, each new generation seems to have to repeat the experiences and frustrations of the past."

Practice Environment Norms. A discourse analysis by Whyte et al. (2017) identified the lack of interprofessional care within the practice environment as a barrier. This sentiment was seconded by Baldwin (2007), who noted the lack of interdisciplinary clinical teams in the teaching environment. In an extensive critical discourse analysis (52 journal articles, 35 books, 20 policy documents, licensure requirements from all 50 states, focus group findings) Smith et al. (2015) uncovered negative stereotypes and conflicting assumptions about the contributions of the various roles of different health professions.

Social and Cultural Elements. O'Keefe and Ward (2018) found an interplay with cultural factors noting that "risk-averse departmental cultures" can be a barrier to developing and compiling learning needs for IPE programs. Shakhman et al. (2020) also noted this challenge. Whyte et al. (2017), in contrast, discovered that a dedicated group of tenacious champions with considerable institutional social and cultural resources may yield sustainable IPE programs.

Resource Allocation. In a discourse analysis (110 documents; peer reviewed journals, grey literature, and unpublished materials) on the University of British Columbia's experience with IPE, Whyte et al. (2017) concluded that pilot projects and short-term funding can set IPE programs up for failure. Their research revealed that without long-term resource commitments IPE efforts waned. Likewise, O'Keefe and Ward (2018) and Shakhman et al. (2020) report that cost constraints limit the integration of IPE into university curricula.

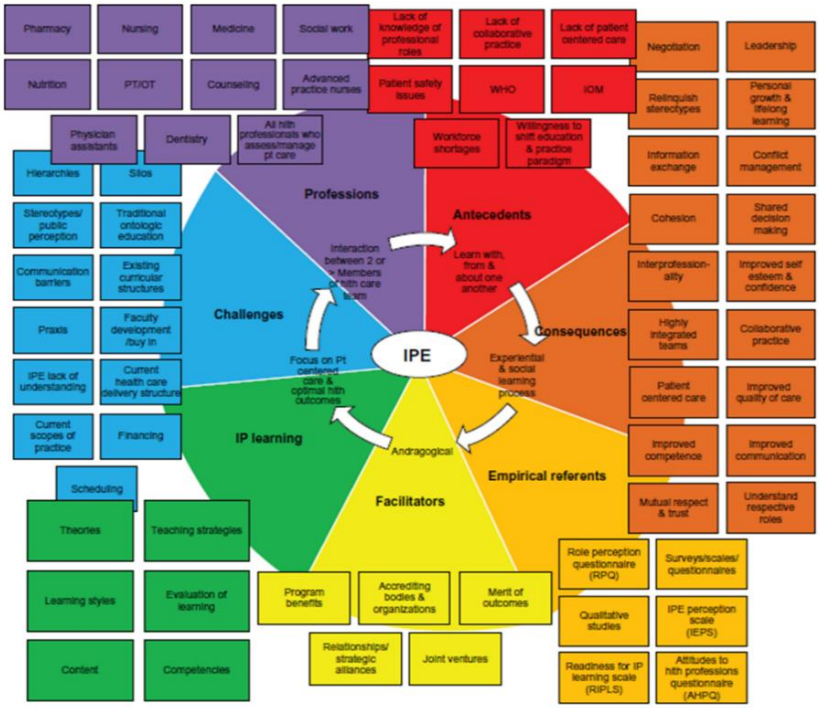
IPE Iterative Color Wheel

Olenick et al. (2010) developed a concept map depicting the complex matrix underlying the wickedness of IPE; it depicts the andragogical, interactive, experiential learning, and socialization processes of this phenomenon. Called the Iterative Color Wheel, this graphic has seven components—professions, antecedents, consequences, empirical referents, facilitators, interprofessional learning, and challenges (see Figure 1). The authors note that the color wheel incorporates the visible factors of IPE. Instructional design theory, however, advocates also considering partially visible or invisible system patterns (Sleezer et al., 2014). This suggests that the color wheel may be missing essential components.

The inner circle of the Color Wheel signifies the patient-centered philosophy of interprofessional care. Specifically, the theoretical basis of IPE that promotes sharing of knowledge, values, and decision-making among the various health profession team members. Positioned around the inner circle are the seven components of IPE identified by Olenick et al. (2010). A discussion about each component follows.

Figure 1

Interprofessional Education Iterative Color Wheel



Professions. Olenick et al. (2010) explain that IPE requires an interaction between at least two health care providers/students engaged in the delivery of patient care. Eleven professions are identified as participants in the interprofessional education process, "nursing (including nurse practitioners or nurses with advanced degrees), medicine, pharmacy, social work, nutrition, physical therapy, occupational therapy, counseling, physician assistant, dentistry, emergency medical services including paramedics, radiology professionals, and respiratory care professionals." The authors further elucidate that IPE can include all health professionals who engage in patient care (Olenick et al., 2010). Other researchers, however, suggest the benefits of including non-clinical team members (Champagne-Langabeer et al., 2018).

Antecedents. Antecedents are defined as the prerequisites that must occur before IPE as a concept becomes a reality (Schiller, 2018). Olenick et al. (2010) note that patient safety and quality of care are the primary drivers for IPE. Indeed, a considerable body of evidence demonstrates that educating health profession students in interprofessional teamwork yields improvements in patient care and improved outcomes (Englander et al., 2013; Farnsworth et al., 2015; Hammick et al., 2007; Khalili et al., 2013). Additional research links interprofessional care with higher patient satisfaction levels, as well as improved health care provider recruitment, satisfaction, and retention (Englander et al., 2013; Farnsworth et al., 2015; Hammick et al., 2007; Khalili et al., 2013). Olenick et al. (2010) also report that interprofessional training helps to address gaps in workforce shortages. Flaherty & Bartels (2019) offer evidence of this example within the field of geriatric medicine. Another antecedent is the need for a student leader to promote the collaborative approach employed in interprofessional clinical care Olenick et al. (2010).

Consequences. Consequences are the outcomes that may occur through participation in the IPE (Schiller, 2018). Olenick et al. (2010) identified 18 consequences of IPE, which fall into six sets of skills, knowledge, and abilities:

- Hone negotiation, leadership, teamwork, and communication skills.
- Practice sharing knowledge, information, decision-making, and patient-centered care.
- Learn strategies for managing conflict.
- Enhance self-esteem, self-confidence, and delivery of care.
- Foster trust, build respect, and dispute stereotypes of different health professions.
- Promote lifelong learning, personal grown, and collaboration.

Empirical Referents. Empirical referents are the factors used to measure how well the attributes of IPE have been achieved (Schiller, 2018). In the instructional design model, empirical referents are comparable with the evaluation step. Designers evaluate the instruction using formative, summative, and confirmative assessments (Sleezer et al., 2013). Empirical referents merge these three types of evaluation. Olenick et al. (2010) provide several existing evaluation instruments (e.g., self-report surveys) used for IPE experiences: Role Perception Questionnaire, Readiness for Interprofessional Learning Scale, Interprofessional Education Perception Scale, and Attitudes to Health Professions Questionnaire (Olenick et al., 2010).

Facilitators. Facilitators are the factors that help promote IPE. Oelnick et al. (2010) list accrediting bodies and other organizations that influence the scope of education for the health professions. For example, accrediting bodies such as the Accreditation Council for Graduate Medical Education (ACGME) and the Accreditation Council for Education in Nutrition and Dietetics include the requirement for IPE in the curricula of accredited programs (Oelnick et al., 2010; Eliot et al., 2020). Other requirements that facilitate the inclusion of IPE in health professions curricula include the need to hone communication skills for interacting with other health care providers, patients, and family members (Olenick et al., 2010). Interprofessional coalitions and advocacy organizations are also noted by Olenick et al. (2010) as facilitators of the concept of IPE. Missing from this list of facilitators are the administrators who push for IPE to help address workforce shortages and control health care costs (Champagne-Langabeer, 2019). Also missing are the learners, whose motivations for "actively" participating in an IPE experience are not explored (Watkins & Leigh, 2010).

Interprofessional Learning. Evidence supports the provision of mandatory IPE early in students' training to help promote theoretical learning about interprofessional clinical teamwork, reinforce the association between collaborative practice and optimal patient health outcomes, and build confidence (Olenick et al., 2010). IPE experiences are both included within the curriculum of an academic curriculum and offered as a supplement educational experience. The principles of adult learning are key in the delivery of IPE experiences. Olenick et al. (2010) suggest that IPE experiences operationalize three learning theories: cognitivism, constructivism, and humanism. IPE learning activities highly rated by students include simulation, role play, problem-based learning, small group learning, and guided reflection (Olenick et al., 2010). IPE weaves the opportunity to socialize with interprofessional colleagues into experiential learning. The learning occurs both from colleagues of the same profession and those of other professions and includes the opportunity to share both knowledge and values. IPE assessment involves measuring changes in learner knowledge, attitudes, behaviors, beliefs, skills, and/or competencies.

Challenges. Olenick et al. (2010, p. 82) identify numerous barriers to delivery of IPE experiences, including "hierarchies, silos, stereotypes, traditional ontologic education, communication barriers, existing curricular structures, faculty buy-in, praxis, faculty education, lack of understanding of IPE, current health care delivery structures, public perception, current scopes of practice, financing, and scheduling." An additional challenge not identified by these authors is the practical issue of capacity; specifically, the ability or inability of organizational units to engage learners in IPE experiences (Watkins & Leigh, 2010).

Employing Instructional Design to Solve the Wicked Problem of IPE

The field of instructional design defines an ill-structured problem as one "whose structure lacks definition in some respect" (Simon, 1973, p. 181). Jonassen (1997) explains that solutions to ill-structured problems require consideration of factors beyond the classroom, factors from multiple content domains must be addressed. Becker (2007) notes that the concept of wicked problems mirrors that of "ill-structured" instructional design problems. The generation of solutions for ill-structure problems, Becker (2007) continues, requires careful consideration of the social context of the problem. As an ill-structured problem, IPE requires components of two or more health professions, psychology (interpersonal communication), and management (teamwork). In addition, elements of interprofessional care that IPE experiences aim to address are characteristic of ill-structured problems, e.g., the unknowns that occur when clinicians interact with each other as well as patients, family members, and caregivers. Lastly, there are constraints imposed by the accreditation demands of health professions' curricula and by regulations regarding the delivery of clinical care.

Other scholars have recognized that ill-structured and wicked problems are similar phenomena. Rojas (2018) explains that both require designers to embrace the "messiness of the situation" and accept that solutions may involve factors that remain uncontrollable. Both Rojas (2018) and Olenick et al. (2010) suggest employing the wicked problem framework for designing educational experiences for health professions students. Olenick et al. (2010) specifically advocate it for the development of IPE experiences. Table 5 provides attributes of IPE as a wicked/ill-structured problem.

Table 5

Attributes of IPE as a Wicked and an Ill-Structured Problem

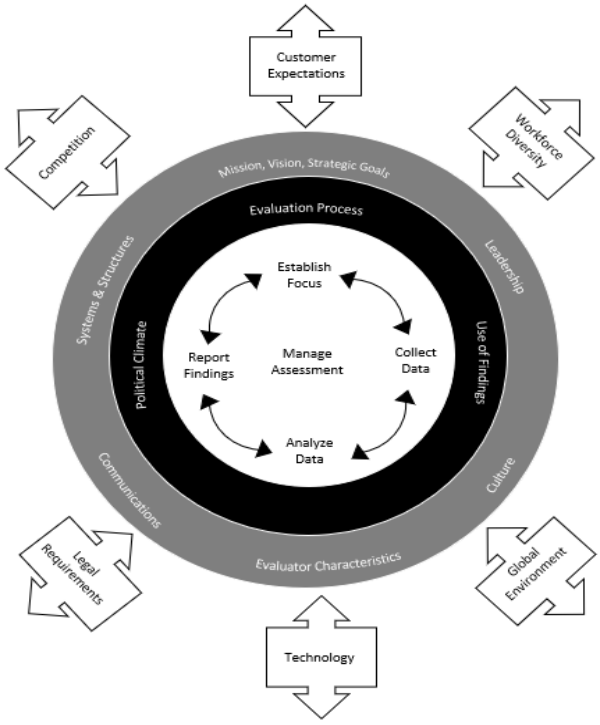
Wicked Problem	Ill-Structured Problem
• Persistent challenge to compile learning needs. • Disparate accreditation requirements. • Struggles establishing IPE teaching collaborations. • Conflicting practice environment norms. • Opposing social and cultural phenomena. • Inadequate resource allocation. • Lack of consensus on the underlying reasons for the successes and failures of past program.	• Careful consideration of the social context of problem. • Multiple domains (profession, communication, management). • Unknowns occur when practitioners interact with each other as well as administrators, patients, family members, and caregivers. • Constraints imposed by the accreditation demands of health professions' curricula and health care regulations. • Designers must embrace messiness and accept that solutions may involve factors that remain uncontrollable.

Systems Model of Evaluation

The Systems Model of Evaluation (see Figure 2) details the myriad of factors that must be evaluated when designing and evaluating instruction (Sleezer et al., 2014). This model guides the collection and analysis of pertinent data regarding individual learners as well as systems, processes, and organizational considerations of the phenomenon (Watkins & Leigh, 2010). Conceived by Preskill and Russ-Eft (2002), the model was developed to offer an evidence-based, systematic approach for evaluating instruction. The original intent was to comprehensively illustrate considerations for "solving the problem" presented to instructional designers. Today, usage includes serving as a starting point for assessing learner needs and designing instruction (Sleezer et al., 2014).

Figure 2

Instructional Design Systems Model of Evaluation



The concept map of the Systems Model of Evaluation contains concentric rings—evaluation phases, evaluation content, internal factors impacting design decisions, and external forces influence the design process. The three rings of the Systems Model of Evaluation graphic depict an interwoven system of various internal and external factors that are required parts of the instruction design development process. This process is not autonomous. Furthermore, the term "systematic" reflects that the process is "planned and purposeful" (Preskill & Russ-Eft, 2002).

Evaluation Phases. The operational aspects of the evaluation process are defined in this center circle (Preskill & Russ-Eft, 2002). The five phases include:

- Focusing the evaluation on the phenomenon: During the focusing phase, the disparate stakeholders are gathered to discuss the background and history of the

phenomenon, identify any missing stakeholders, and craft a list of questions that the evaluation will seek to answer.

- Designing the evaluation, data collection protocol, and collecting the data: The model also advocates key stakeholder involvement in this process. Insights are gleaned from this core group on how to ensure data validation, high engagement among target audience members, and opinions on the logistics of implementation.
- Analyzing the findings: During this phase, analyses are conducted. In addition to the analysis, "interpretation and assigning meaning to the data" are done.
- Communicating and reporting on the evaluation process and findings: Dialogue is ongoing and preliminary findings are shared throughout the evaluation process.
- Managing the evaluation: Project management is a continual process. Tasks include facilitating roles and responsibilities, developing a work plan, overseeing the timeline, leading project communications and reporting, and addressing barriers as they emerge.

Evaluation Context. Preskill & Russ-Eft (2002) explain that the evaluation process is implemented within the context of the organization and the researchers. For example, both the political dynamics of the organization and the positionality of the designer influence implementation and execution of the process (Preskill & Russ-Eft, 2002). Furthermore, unintended consequences of the evaluation process are considered within this inner circle of evaluation process factors (Preskill & Russ-Eft, 2002). The process is also fluid, and the designer must determine how best to implement it based on the developmental stage of the phenomenon (Preskill & Russ-Eft, 2002; Rossi & Freeman, 1982).

Internal Factors. The next circle looks at the internal factors of the client/organization triggering the design evaluation process (Preskill & Russ-Eft, 2002). These factors consider the organization's mission, vision, and strategic goals that the design must complement (Preskill & Russ-Eft, 2002). The philosophy of the leadership and the influence of the systems, structure, and culture of the entity must also be weighed (Preskill & Russ-Eft, 2002). For example, leadership buy-in of the process will yield more valuable findings (Preskill & Russ-Eft, 2002). A culture that is open to teamwork, honest communication, and risk-taking will also be more supportive of the process (Preskill & Russ-Eft, 2002).

External Factors. Embracing a systems' perspective, external forces can also be facilitators and/or barriers to the design process and must be carefully assessed (Preskill & Russ-Eft, 2002). The most influential external force are the expectations of the customers/learners. Other factors include the global and regulatory environment pushing on the organization. Technology, competition, and workforce diversity are additional considerations. An important part of the process is becoming aware of how the organization responds to these external forces (Preskill & Russ-Eft, 2002).

Application of the Systems Model to the Learning Needs Assessment

An instructional design learning needs assessment employs the Systems Model of Evaluation to gather data on the specific needs of the unique set of learners; identify the broadly-based problems to be solved; ensure past or current problematic issues are avoided; leverage future opportunities; and map the learning, development, and growth (Fayzulloeva, 2020; Sleezer et al., 2014; Tipping, 1998). The needs assessment process also offers strategies for assessing systems including measurable visible patterns;

measurable, partially visible or invisible patterns; and difficult to measure, invisible patterns (Sleezer et al., 2014). Viewing learner needs employing the iceberg model has been suggested. This allows instructional designers to examine elements that may be "hidden below the surface" that may affect the learning experience. For example, social and political factors (Kossakowska-Pisarek, 2017).

This needs assessment employs an interpretive/constructive epistemological approach—the objective is to collect information about stakeholder perspectives (Tipping, 1998). Kossakowska-Pisarek (2017) explains that incorporation of the viewpoints of the various stakeholders makes the learning needs assessment process complex. Stakeholder responses are compiled into a strategic framework that is used to guide the design and development process of the instruction; there are no right or wrong answers (Tipping, 1998; Sleezer et al., 2014). Of note, Tipping (1998) refers to a focus group as a methodology for compiling learning needs.

The initial step of the learning needs assessment includes a preliminary analysis during which instructional designers assess the reason for conducting the needs assessment and organizational priorities regarding the outcomes of the assessment. Strategic priorities, for example, aim to address gaps between current/optimal conditions for the achievement of long-term organizational goals and operational priorities on short-term goals (Sleezer et al., 2014). For educators of nutrition and dietetic students, strategic priorities include the need to shift IPE learner needs from the undergraduate to graduate model required in 2024; operational priorities include the need to ensure compliance with current IPE accreditation requirements. Priorities may also focus on filling gaps to address individual performance needs and/or increasing knowledge and skills to meet

organization needs (Sleezer et al., 2014). Evaluation of the organizational priorities guides the selection of which of the five types of needs assessment to perform. Needs assessment approaches fall into five broad categories: knowledge and skills assessment; job and task analysis; competency-based needs assessment; strategic needs assessment; and complex needs assessments (Sleezer et al., 2014).

The Complex Needs Assessment

A Complex Needs Assessment investigates "multifaceted" needs by compiling perceptions from internal and external stakeholders (Sleezer et al., 2014). IPE learner needs are messy—health professions education programs must ready students for the labyrinth of the health care arena. Thus, it is not surprising that Complex Needs Assessments have been used by other researchers to identify learning needs of the students in a variety of health professions programs. Javaeed (2019) conducted a Complex Needs Assessment to ascertain the needs of undergraduate medical students; Gan and Goh (2015) to gather needs for a resident-as-teacher curriculum. Of note, however, neither followed an instructional design protocol for data collection. Javaeed (2019) based the findings on a literature review; Gan and Goh (2015) on the results of an anonymous, voluntary survey with multiple choice and free text questions. Meshkat et al. (2018), however, loosely mirrored the instructional design process for a Complex Needs Assessment on the educational needs of emergency medicine physicians.

Leveraging Action Research for Compiling a Learner Needs Assessment

Action research dates back to the 1940s (Dickens & Watkins, 1999; Masters, 1995). Dickens and Watkins (1999) state that Lewin offered the term action research to describe the requisite activities required to facilitate change among groups, organizations,

and societies. Action research involves, “creating partnerships, building coalitions, developing relationships, planning and replanning, and coordinating action” (Huffman, 2017, p. 1). The process cycles until a satisfactory outcome is reached (Dickens & Watkins, 1999; Huffman, 2017). Lewin advocated the need to study the phenomenon within its natural environment (Realin, 1999). By engaging participants as co-researchers, a community dedicated to the outcome and consequences associated with that change societies is created (Dickens & Watkins, 1999).

During the years, six action strategies emerged: action research, participatory research, action learning, action science, developmental action inquiry, and cooperative inquiry (Raelin, 1999). These strategies share the goal of systematically investigating a group or organizational phenomenon (Raelin, 1999). All of the strategies analyze the impact of specific actions on the stakeholders and organizational mission (Raelin, 1999). Raelin (1999) notes that action research theory can be employed to foster collaborations among professions from different fields. Participatory action research also helps to balance disparities in power-related inputs and decision-making authority (Raelin, 1999).

Given that it actively engages stakeholders in the research process, action research has been employed by other researchers for the instructional design data collection process (Heyerdahl et al., 2020; Huffman, 2017; Kattelman et al., 2014; Kember, 1998; Lewis & Prunuske, 2017; Muramoto et al., 2015; Olfert et al., 2018). The participatory design approach has been suggested as a strategy for solving wicked problems (Kpamma et al., 2017). Karam et al. (2019) utilized a participatory action research approach for the development of interprofessional collaboration between general practitioners and home care nurses.

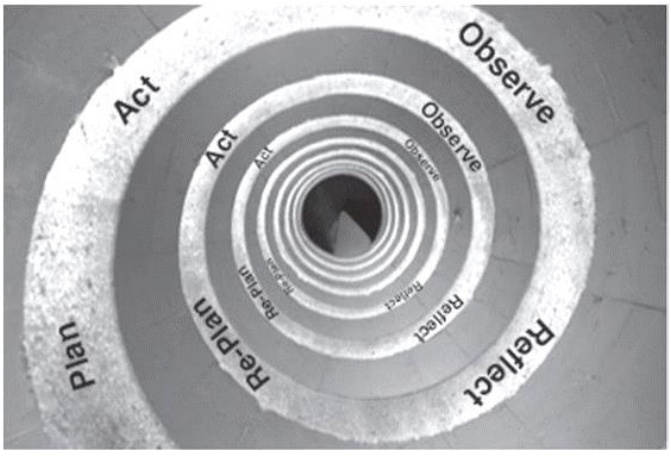
Participatory Action Research Spiral

Participatory action research entails working with stakeholder groups immersed in hegemonic relationships. Interventions aim to promote stakeholder-driven system change (Ravitch & Carl, 2016). Participatory action research has been described as a continual process in which stakeholders collaboratively engage in cycles of planning, acting, observing, and reflecting. Based on the insights gleaned during the reflective process, planning starts again, and stakeholders continue to act, observe, and reflect (Kemmis et al., 2014; Kpamma et al., 2017).

The cycling reflects that for the identified problem, flexibility is paramount. The need to remain responsive to environmental flux is required (Kemmis et al., 2014). The researcher engages as a participant. The participants engage as researchers (Kemmis et al., 2014). Kemmis et al. (2014) created the Participatory Action Research Spiral to illustrate this process (see Figure 3).

Figure 3

Participatory Action Research Spiral



Plan. During the planning stage the problem is identified, as well as the desired outcome and the stakeholders who need to be involved (Burns, 2010; Dickens &

Watkins, 1999; Kemmis et al., 2014; Raelin, 1999). Collaboratively the stakeholders craft an action plan (Burns, 2010; Kemmis et al., 2014). Details include the scope, approach, timing, and required resources involved (Burns, 2010). Challenges during this phase include overcoming political, social, and cultural barriers that might exist between different stakeholder groups involved (Burns, 2010).

Act. During this stage, the strategies and actions required to implement the plan are compiled (Burns, 2010; Kemmis et al., 2014). The stakeholders consider the steps underlying the plan that will promote change and the ramifications of those changes (Burns, 2010). Ethical considerations are weighed and strategies for optimizing objectivity during the observation phase developed (Burns, 2010). The plan is then implemented (Burns, 2010).

Observe. Prior to launching into the observation phase, the types of data to be collected and data collection tools/techniques are collaboratively selected (Burns, 2010; Watkins, 1991). Observation roles are defined (Burns, 2010). During this phase, the impact of the plan is closely monitored (Burns, 2010). Observations and other data are documented (Kemmis et al., 2014).

Reflect. The findings of the observation phase are compiled and analyzed (Burns, 2010). The team of stakeholders collaboratively discusses, analyzes, and interprets the outcomes (Burns, 2010; Kemmis et al., 2014). Evidence supporting the intended outcomes is explored, as well as the unintended outcomes (Burns, 2010). How well the potential solutions resolved the issue is analyzed (Kemmis et al., 2014).

Re-plan. Based on the findings of the reflection stage, the plan is refined, or an alternative approach developed. If a revised or new plan is crafted, the cycle of act-observe-reflect is initiated again (Kemmis et al., 2014).

Emerging Research Need

The literature contains no reports on the findings of Complex Needs Assessments used to evaluate the IPE learning needs of nutrition and dietetics students. Furthermore, among nutrition and dietetics faculty there appears to be very limited utilization of the evidence-based instructional design principles for constructing educational experiences. The accreditation mandate to offer IPE experiences to nutrition and dietetic students, supports the need for an evidence-based IPE learning needs assessment. Lastly, the shift in the academic requirement (from bachelor to master's degree) to sit for the national registration exam further elucidates the importance of this research.

The literature also reveals that the lack of a method that spans three domains—interprofessional education, instructional design, and qualitative research. Optimally, the conceptual framework for this evaluation study leverages the strengths of each of theoretical frameworks discussed above and compensates for their weaknesses. The opportunity to present a novel conceptual framework also precipitates.

Chapter III: Methods

The primary research question investigated was: What are the interprofessional learner needs of nutrition and dietetics students? The secondary question was: Does the 2024 master-prepared requirement impact the interprofessional learner needs of nutrition and dietetic students? Finally, the implementation of a novel conceptual framework, wedding the domains of qualitative research, instructional design, and interprofessional education, was assessed.

Evaluation Design

This evaluation study followed the formal protocol offered by Sleezer et al. (2014) for conducting a Complex Needs Assessment. An interpretivism/constructivist epistemology is embedded in an instructional design-driven learning needs assessment. The interpretivism epistemology introduces the researcher's beliefs and feelings into the process. The constructivism epistemology, the researcher's understanding of the phenomenon (Levers, 2013). Furthermore, the adoption of an observer-as-participant researcher role requires careful consideration of the influence of the researcher's positionality (Levers, 2013).

This research was conducted from the perspective of an RDN who has worked in the health care field for several decades and is currently employed as an Assistant Professor in Nutrition and Dietetics at a 4-year state university in the northwestern United States. As a faculty member, she held a hegemonistic position for some of the study participants. To help achieve validity and optimize trustworthiness, perspectival triangulation was employed. Specifically, participants included stakeholders (internal and external) with different roles and from a range of health professions.

Credibility for this study was gained through a participant validation protocol that mandates member checking during the data collection/analysis process. Member checking entails asking participants to review summaries of the findings and comment on their accuracy. The goal was to ensure that the researcher's conclusions resonate with the experiences of all the stakeholders. Member checking was employed three times: (a) expert review of the Moderator's Guide, (b) focus group participant review of the findings, and (c) focus group participant review of the Interprofessional Education (IPE) Learning Needs of Nutrition & Dietetic Students final report.

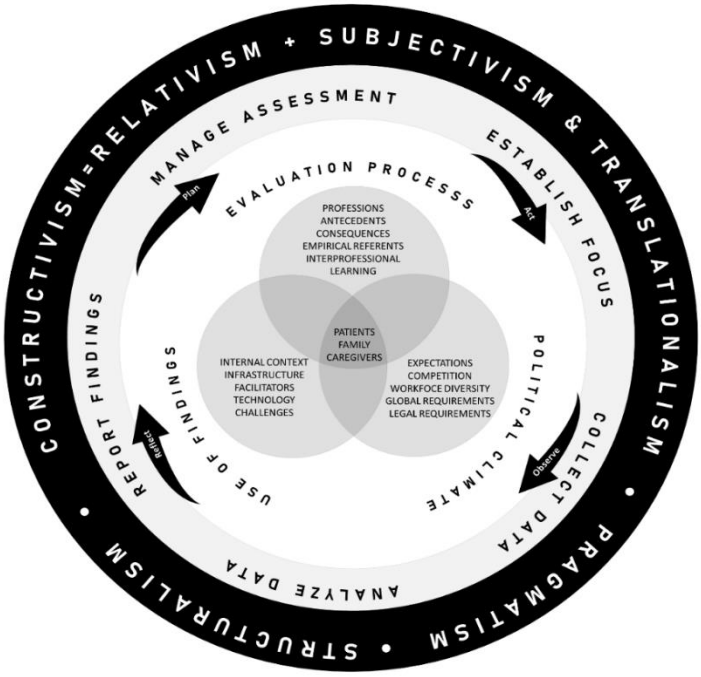
Conceptual Framework

This study employed a novel conceptual framework, called the Participatory Action Research and Systems Evaluation for Interprofessional Education (PARSE-IPE). Theoretical concepts from three domains—participatory action research, instructional design, and interprofessional education—were combined. Thereby, overcoming the barriers posed by the wicked or ill-structured nature of IPE. The PARSE-IPE conceptual framework (see Figure 4) marries three theoretical models: Participatory Action Research Spiral (qualitative research), Systems Model of Evaluation (instructional design), and Iterative Color Wheel (interprofessional education). None of these existing models are robust enough to fully address the intricacies of IPE. PARSE-IPE leverages the strengths of participatory action research and the instructional design systems model of evaluation to construct an interpretative approach for designing sustainable IPE experiences.

A two-step approach was utilized in developing the PARSE-IPE conceptual framework. The first step was a review of the literature to gather relevant studies from the three domains. The second step was a modified grounded theory approach that examined

Figure 4

PARSE-IPE Conceptual Framework



the postulatory constructs and components of the theoretical models for each domain. Grounded theory is a qualitative technique that employs a systematic approach for conducting comparative analysis and producing novel theories (Ravitch & Carl, 2016; Strauss & Corbin, 1998). Jabareen (2009) proposed a method for constructing conceptual frameworks that link multidisciplinary domains employing a modified version of grounded theory. The modified grounded theory protocol entails (a) grouping similar components of the three models and identifying conceptual labels for each group, (b) organizing findings thematically, and (c) explaining the patterns of the emerging relationships. Furthermore, it required the inclusion of ontological, epistemological, and methodological assumptions for the conceptual framework. Jabareen (2009) posits that each component of the framework must contribute to the ontological and epistemological

postulates of the framework and that the framework must also define the key components and relationships between the various components.

The outer ring of the PARSE-IPE framework holds the philosophical foundations. This includes the constructivism paradigm—the Spiral, Systems Model, and Color Wheel share this philosophy. PARSE-IPE also embeds the pragmatism and structuralism into the IPE process. The methodological assumption underlying these ontological and epistemological philosophies is interpretivism. This position posits that the social world is constructed through group interactions.

The next ring of the PARSE-IPE framework depicts the management steps of the instructional design process. These steps are managing the assessment, establishing focus, collecting data, analyzing data, and reporting findings. Positioning these steps in this outer ring illustrates that a deliberate approach drives the design process. It also emphasizes the importance of a holistic, systems approach advocated by the evidence-based instructional design process.

At the inner base of that outer ring are the four steps of the Participatory Action Research Spiral. This position indicates that this qualitative methodology drives the data collection and analysis process. It also reflects that the action research steps offer a strategy for how to implement the evaluation phases. Furthermore, it helps ensure that all relevant stakeholders are engaged in the planning, data collection, and interpretation process. Lastly, the reflect and re-plan stages of the spiral allow for the essential qualitative research step of member checking. Member checking is essential to ensure the findings are not overly influenced by researcher's positionality.

In the center ring sit three circles that incorporate elements of both the Color Wheel and the Systems Model. One circle contains the core elements of IPE (professions, antecedents, consequences, empirical referents, and interprofessional learning). The second circle includes external forces, e.g., expectations (learners, patients, instructors, accreditors, employers), workforce diversity, competition, and global and legal requirements. The final circle focuses on internal forces including the organizational context, culture and infrastructure, technology, facilitators, and challenges. In the center area, where these three circles intersect is the patient. This signifies that the patient is the primary focus of the IPE exercise.

Data Collection and Analysis

A Complex Needs Assessment was selected to explore the perceptions of diverse stakeholders on the knowledge and skills, specific jobs and tasks, competencies, and strategic needs (Sleezer et al., 2014) required for effective IPE experiences. The Complex Needs Assessment involved three phases: (a) pre-assessment (b) needs assessment, and (c) post-assessment. Specific activities to be conducted in each of these steps are reviewed below.

Phase 1: Pre-Assessment—Planning and Participant Selection/Recruitment

Phase one activities included getting organized, establishing the focus of the study, developing the assessment instrument, planning the study implementation, and establishing goals for reporting preliminary findings and insights to stakeholders (Sleezer et al., 2014). The “standards” published by the accrediting body for nutrition and dietetics programs relating to interprofessional education/practice were compiled. In addition, a

list of IPE skills and knowledge for health professions that precipitated from the literature review were compiled.

Drawing on the emerging themes from the standards and the knowledge, skills, and competencies tables, a data collection tool (moderator's guide) was developed for conducting structured interviews. Content validity testing was conducted—a group of experts/potential participants evaluated the moderator's interpretation of the topic for each of the identified audiences. This step served as the "focusing" of the evaluation phase. Appendix 1 contains a copy of the guide.

Convenience sampling was employed to gather 41 internal and external participants from colleges, health care facilities, and the community with knowledge about the topic. Recruitment of students and faculty included sending announcements via college mailing lists and other community communication channels. Health care providers were recruited through local and state professional organizations, patients through hospital networking channels. A referral process was also employed to solicit input regarding additional potential participants.

Phase 2: Needs Assessment—Data Collection and Analysis

A series of eight, 90 minute, online focus groups were conducted on Zoom, including (a) nutrition and dietetics students, (b) health professions students, (c) nutrition and dietetics faculty members, (d) health professions programs faculty members, (e) dietitians working in clinical and community settings, (f) dietitians working in food service management settings, (g) health care administrators, and
(h) patients/caregivers/family members with chronic conditions. The Zoom meeting required a password for entry. Of note, in a review article, Stewart and Shamdasani

(2017) conclude that online focus groups are a practical alternative to in-person groups, especially among populations that have access to the required technology and are comfortable communicating in Internet environments. Archibald et al. (2019) reported that Zoom is an efficacious platform for qualitative data collection. Participants provided written consent (online form) to be interviewed and video-recorded before the start of the focus groups.

The video and transcripts were downloaded and stored in a password-protected computer file; the files on the cloud were deleted. The researcher reviewed the transcripts, masked all identifiable personal data, and created a narratively compiled, thematic summary document which was sent to focus group participants for member checking. Edits from participants were incorporated into the focus group summaries. The summaries were coded narratively from a constructivist point-of-view. Themes, trends, and patterns were documented. Both the individual and combined focus group findings were compiled into the Interprofessional Education (IPE) Learning Needs of Nutrition & Dietetic Students final report.

The learner analysis employed multiple data collection methods. An evaluation was done based on the 2020-2021 population of the Idaho State University (ISU) undergraduate, graduate, and dietetic internship population. In addition, a document analysis was conducted that entailed compiling characteristics from studies published in the peer-review literature. Insights gleaned from focus group participants were compiled.

A series of coding strategies were used to analyze the data. Attribute coding was initially employed to categorize the data into learner characteristics, tasks, evaluation, and resource considerations. Descriptive coding was utilized to inventory topics. Finally,

axial coding was then used to explore relationships between the categories and subcategories.

Phase 3: Post-Assessment—Report Out and Additional Member Check

Phase three included preparing and delivering the final report. The final report and actionable research findings were presented to focus group participants for an added member check. Appendix 2 contains a copy of the report.

Chapter IV: Findings

The findings are grouped into three sections. The first section is the document analysis. It provides the results of the compiled interprofessional education (IPE) requirements imposed by the accrediting body. In addition, the findings of a literature search on the knowledge, skills, and competencies required to be an effective member of an interprofessional team is presented. The second section starts with a snapshot of the focus group participants. This section includes the summaries of the findings on the learner characteristics, as well as the task, instructional strategy, evaluation tool, and resource considerations. Peppered throughout are quotes by focus group participants. The final section is a logic model mapping the inputs and outputs needed to achieve the desired impacts.

Results of Document Analysis

After a discussion on the accreditation body's mandated requirements, the findings of a literature review on the learning needs of nutrition and dietetic students are summarized. The review focused on studies including nutrition and dietetic students. The competencies adopted by a group of interprofessional professional associations are also discussed.

ACEND Mandated IPE Requirements

There are multiple pathways to becoming a registered dietitian nutritionist (RDN). All involve completion of a college degree and supervised practicum. Afterwards, individuals must pass a national examination.

The two most common options are the Didactic Program in Dietetics (DPD) coupled with a Dietetic Internship (DI) and the Dietetics Coordinated Program (CP). The

DPD is an Accreditation Council for Education in Nutrition and Dietetics (ACEND) accredited four-year academic program coupled with a one-year dietetic internship. (ACEND, 2016a). A DI is a post-baccalaureate degree program that admits only individuals who have a verification statement from a DPD or Foreign Dietitian Education program with at least a baccalaureate degree (ACEND, 2016a). A Dietetics Coordinated Program (CP) is an ACEND accredited United States-based college or university program that includes a DI concurrently with the baccalaureate degree (ACEND, 2016a). Upon completing a DI or CP, individuals can sit for the registration exam required to become an RDN (Commission of Dietetic Registration, 2021b).

ACEND is shifting dietetics programs to a competency-based education (CBE) model that mirrors those employed by other health professions. The CBE model incorporates "hands-on supervised experiential learning activities" into didactic education (ACEND, 2016b). This new educational approach is being introduced through pilot programs evaluating the Future Education Model (FEM). FEM is an ACEND-accredited program that is approved to evaluate new competencies and training for becoming an RDN (ACEND, 2016b).

FEM programs also introduce the minimum requirement of a master's degree to take the credentialing exam to become a dietitian (ACEND, 2016b). The reason for elevating the entry-requirements for the field is to better prepare students with the knowledge, skills, and research orientation required to enter practice in today's health care environment (ACEND, 2016b).

Interprofessional Education/Practice Standards. ACEND has required standards for programs training the future RDN workforce. The ACEND Standards for

the DPD/DI and CP models include the required curricula elements for academic programs, knowledge for registered dietitian nutritionists (KRDN), and competencies for registered dietitian nutritionists (CRDN). Table 6 compares the ACEND IPE Standards for the DPD/DI and CP models with the standards for the FEM. The future model focuses on students demonstrating their ability to be effective members of IPP teams.

Table 6

ACEND Interprofessional Education/Practice Standards

DPD/DI or CP Programs		
Competency	Required Element	Knowledge
CRDN 2.4 Function as a member of interprofessional teams.	Required Element. Governance of nutrition and dietetics practice, such as … interprofessional relationships in various practice settings.	KRDN 2.2 Describe… interprofessional relationships in various practice settings. 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.

FEM Programs	
Competency	Performance Indicator
Unit 5: Leadership, Business, Management and Organization—5.2 Applies principles of organization management.	5.2.10 Understands and respects the roles and responsibilities of interprofessional team members.
Unit 7: Core Professional Behaviors—7.2 Uses effective communication, collaboration, and advocacy skills.	7.2 Uses effective communication, collaboration, and advocacy skills.

SOURCE: Accreditation Council for Education in Nutrition and Dietetics (2016a, 2016b).

Findings on the Learning Needs of Students in Nutrition and Dietetics

Numerous peer-reviewed articles offered insights into the knowledge and skills included in IPE programs targeting various health profession students (ACEND, 2016; Bambas, 2016; Coletti et al., 2020; Dacey et al., 2010; Doll et al., 2013; Karamet et al., 2018; Holthaus et al., 2015; Maree et al., 2017; Mellor et al., 2013; Mink et al., 2020; Olenick et al., 2010, Patton et al., 2018). Required knowledge included an understanding of the work of interprofessional teams, the scope of practice, and the roles of other team members (ACEND, 2016; Coletti et al., 2019; Doll et al., 2013; Holthaus et al., 2015; Karamet et al., 2018; Mellor et al., 2013; Olenick et al., 2010, & Patton et al., 2018). Maree et al. (2017) added awareness of health literacy and translational research. An understanding of patient-centered care and the cost of care was highlighted in two studies (Coletti et al., 2010, & Olenick et al., 2010). An appreciation for ethics was a theme in the Doll et al. (2013), Holthaus et al. (2015), and Patton et al. (2018) studies.

Ten studies emphasized teamwork skills (Coletti et al., 2020; Dacey et al., 2010; Doll et al., 2013; Englander et al., 2013; Flood et al., 2019b; Holthaus et al., 2015; Maree et al., 2017; Mink et al., 2020; Olenick et al., 2010; & Patton et al., 2018). The need to sharpen communication, negotiation, and conflict management skills also emerged (Dacey et al., 2010; Doll et al., 2013; Flood et al., 2019b; Holthaus et al., 2015; Maree et al., 2017; Olenick et al., 2010; & Patton et al., 2018). Additional skills included technology, time management, and writing (Bambas, 2016; Coletti et al., 2020). Coletti et al. (2020) and Holthaus et al. (2015) also emphasized patient engagement skills and Olenick et al. (2010) leadership skills.

Competencies are often the focus of interprofessional education (Flood et al., 2019b). Autonomy counterbalanced by working as part of an interdependent team was the most mentioned competency (Coletti et al., 2020; Karamet et al., 2018; Mellor et al., 2020; Mink et al., 2020; Olenick et al., 2010; Williams et al., 2020). Other interpersonal competencies included listening with care, taking others seriously, comfort being challenged, and engaging in shared decision-making (Flood et al., 2019b; Karamet et al., 2018; Mellor et al., 2013; Mink et al., 2020; Olenick et al., 2010; Williams et al., 2020). The importance of values and the ability to identify and respect unique cultures were also key competencies (Doll et al., 2013; Holthaus et al., 2015; Karamet et al., 2018; Olenick et al., 2010). Table 7 details the IPE knowledge, skills, and competencies.

To promote interprofessional practice and team-based care for enhancing patient and population optimal outcomes, the Interprofessional Education Collaborative (IPEC) convened representatives of six health professions (dentistry, nursing, medicine, osteopathic medicine, pharmacy, and public health; IPEC, 2016). Under the domain of "interprofessional collaboration," in 2011 this group crafted four IPE competencies relevant for all health professionals. The competencies were updated in 2016 to mirror changes in the health care system including the Patient Protection and Affordable Care Act. Tweaks were also made to refine the focus on improving a patient's health care experience, reducing the health care costs, and the goal of enhancing the health of populations (IPEC, 2016).

Table 7

Overview of IPE Knowledge and Skills Gleaned from the Literature

		ACEND, 2016	Bambas, 2016	Coletti et al., 2020	Dacey et al., 2010	Doll et al., 2013	Englander, et al., 2013
KNOWLEDGE	Work of interprofessional teams	X					
	Professional scope of practice			X		X	
	Roles of other team members	X					
	Cost of care			X			
	Ethics					X	
	Health literacy						
	Translational research						
	Patient-centered care						
SKILLS	Communication				X	X	
	Patient engagement			X			
	Teamwork			X	X	X	X
	Technology			X			
	Time management			X			
	Writing skills		X				
	Negotiation						
	Leadership						
	Conflict Management						
COMPETENCIES	Autonomy/ interdependence			X			
	Identify/respect unique cultures				X		
	Listening with care						
	Taking others seriously						
	Comfort being challenged						
	Values					X	
	Shared decision making						

Table 7, continued

Overview of IPE Knowledge and Skills Gleaned from the Literature

		Flood et al., 2019b	Holthaus et al., 2015	Karamet et al., 2018	Maree et al., 2017	Mellor et al., 2013
KNOWLEDGE	Work of interprofessional teams		X			
	Professional scope of practice		X	X		X
	Roles of other team members		X			
	Cost of care					
	Ethics		X			
	Health literacy				X	
	Translational research				X	
	Patient-centered care					
SKILLS	Communication	X	X		X	
	Patient engagement		X			
	Teamwork	X	X		X	
	Technology					
	Time management					
	Writing skills					
	Negotiation					
	Leadership					
	Conflict Management					
COMPETENCIES	Autonomy/ interdependence			X		X
	Identify/respect unique cultures		X	X		
	Listening with care	X		X		
	Taking others seriously	X				
	Comfort being challenged	X				X
	Values		X	X		
	Shared decision making					

Table 7, continued

Overview of IPE Knowledge and Skills Gleaned from the Literature

		Mink et al., 2020	Olenick et al., 2010	Patton et al., 2018	Williams et al., 2020
KNOWLEDGE	Work of interprofessional teams		X		
	Professional scope of practice			X	
	Roles of other team members		X		
	Cost of care				
	Ethics			X	
	Health literacy				
	Translational research				
	Patient-centered care		X		
SKILLS	Communication		X	X	
	Patient engagement				
	Teamwork	X	X	X	
	Technology				
	Time management				
	Writing skills				
	Negotiation		X		
	Leadership		X		
	Conflict Management		X		
COMPETENCIES	Autonomy/ interdependence	X	X		X
	Identify/respect unique cultures		X		
	Listening with care				
	Taking others seriously		X		X
	Comfort being challenged	X			X
	Values				
	Shared decision making		X		

To promote interprofessional practice and team-based care for enhancing patient and population optimal outcomes, the Interprofessional Education Collaborative (IPEC)

convened representatives of six health professions (dentistry, nursing, medicine, osteopathic medicine, pharmacy, and public health; IPEC, 2016). Under the domain of "interprofessional collaboration," in 2011 this group crafted four IPE competencies relevant for all health professionals. The competencies were updated in 2016 to mirror changes in the health care system including the Patient Protection and Affordable Care Act. Tweaks were also made to refine the focus on improving a patient's health care experience, reducing the health care costs, and the goal of enhancing the health of populations (IPEC, 2016). The four components of the 2016 IPEC interprofessional collaboration follow.

- Values/ethics: Collaboratively work with other professionals; embrace mutual respect and the shared values of interprofessional collaboration.
- Roles and responsibilities: Employ one's professional scope of knowledge and practice, and leverage those of other professionals to assess and address the needs of patients and populations.
- Communication: Communicate with patients, families, communities, and other members of the IPP team in a manner that reflects a team approach and helps maintain health and prevent and treat disease.
- Teams and teamwork. Build and value relationships and embrace shared decision-making to plan, deliver, and evaluate patient/population-centered care and programs/policies that are safe, timely, efficient, effective, and equitable.

Dissemination of the IPEC competency led to other health professionals adopting this framework for their student populations (Belleza, 2020; IPEC, 2016; Ludwig et al., 2019). Examples of other professions employing the IPEC model are occupational therapy, optometry, physical therapy, podiatry, psychology, and social work (IPE, 2016). Speech language pathology developed their schema within the IPE framework (Belleza, 2020). Today, IPEC includes 21 health professions (IPEC, 2021). The IPEC model was also embedded into the IPE activity reported in the Holthaus et al. (2015) study.

Learner Traits, Task Analysis, and Evaluation and Resource Considerations

After an overview of the participants the eight focus groups, details of this part of the learning needs assessment are provided. Data was organized in a series of tables. Quotes from focus group participants are provided to support the findings.

Snapshot of Focus Group Participants

The recruitment survey was open for seven weeks (May 30, 2021 – July 16, 2021). Ninety-three responses were received; however, of those only 73 consented and were available to participate in focus groups during June and July 2021. About half (56.2%, 41/73) of that group participated in one of the focus groups. See Table 8.

Table 8

Overview of Responses to the Recruitment Survey

Total respondents	93
Did not meet age criteria	0
Not available for focus group (June/July)	2
Did not consent	9
Not submitted	4
Duplicate submissions	5
Submitted, consented, and available	73
Participated in focus groups	41
Participated in member-check	40

Eight focus groups were conducted. Participants were divided by specific stakeholder groups: (a) students enrolled in nutrition and dietetic programs, (b) students enrolled in other health professions programs, (c) faculty of nutrition and dietetic programs, (d) faculty of other health professions programs, (e) RDNs practicing in clinical and community settings, (f) RDNs practicing in community and foodservice management settings, (g) administrators in the health care sector, and (h) patients/caregivers/family members. Forty-one individuals participated in the focus groups (females = 35, males = 6). There were 20 internal and 21 external stakeholders. The majority of the participants were from the northwestern United States. Table 9 is an overview of participants per focus group. Of note, 98% of them participated in the member check step.

Table 9

*Snapshot of Participants per Focus Group**

Stakeholder Group	Students		Faculty		RDNs		ADMIN	Patients
	NUTR	Other	NUTR	Other	C&C	FSM		
Administration							2	
Family Medicine				1				
Nurse Practitioner		3						
Nursing				1				
Nutrition and Dietetics			6					
Undergraduate	5							
Graduate	5							
Clinical					2			
Community					1		3	
Food Service Mngt.						6		
Pharmacy				1				
Physician Assistant		1						
Social Worker				2				
Speech Pathology		1						
Family Member								1
Totals	10	5	6	5	3	6	5	1
					Total focus group participants			41

Table 10

*Cumulative Perspectives Stratified by Five Stakeholder Types**

Stakeholder Group	Students		Faculty		RDNs		Admin	Patients
	NUTR	Other	NUTR	Other	C&C	FSM		
Administration						6	2	
Family Medicine				1				
Nurse Practitioner		3						
Nursing		3		1				
Nutrition and Dietetics			6					
Undergraduate	5							
Graduate	5				2	1	1	
Clinical	1		3		5		3	
Community			3		4		3	
Food Service Mngt.						6		
Pharmacy								
Physician Assistant				1				
Social Worker		1						
Speech Pathology				2				
Family Member		1						1
Totals	11	8	12	5	11	13	9	1
							Cumulative perspectives	70

*ADMIN = Administrator in the health care sector
C&C = Clinical and community nutrition practice setting
FSM = Foodservice management practice setting
NUTR = Nutrition

Some participants represented multiple perspectives. For example, many of the participants were both clinicians and faculty members. One dietitian was a graduate student in Health Sciences; she worked in an administrative food service role and taught at a university. Seven of the health care providers (who were not dietitians) participated in the focus groups. The cumulative perspectives thus reflect 70 insights from the five key stakeholder groups (students, faculty, practitioners, administrators, and patients/caregivers/family members). Table 10 provides a breakdown of the cumulative perspectives.

Learner Analysis

The learner analysis provides a snapshot of the characteristics of the nutrition and dietetic students. Findings are divided into the three modes of data collection: (a) ISU student body analysis, (b) characteristics compiled from the literature, and (c) insights from the focus groups.

Learning Characteristics Compiled by Faculty. ISU Nutrition and Dietetic students are predominately white females in the first two decades of life. They have done well in college (3.0 or better cumulative GPA in their major area of study) and typically are highly motivated learners. Many of the students share a common desire to "help others" as a reason for becoming a dietitian. About one-third of the group are transfer and/or second-degree students; thus, they tend to be more mature students who may also be the primary caregivers for young children. There typically is at least one male student. Though most of the students hail from the Pacific Northwest, there is also a small number of culturally diverse students (Hispanic/Latino, Asian, Native American). Some of the students have learning disabilities, known because of the need to provide accommodations. Most are interested in practicing in a community setting. They lack confidence in their clinical skills and have limited interest in food service management. Table 11 provides a snapshot of learning characteristics compiled based on an analysis of the ISU student body.

Learner Characteristics Compiled from the Literature. Four studies provided insights into the learner characteristics of nutrition and dietetic students. Clark et al. (2017) reported on graduate student traits predictive of program success among the active-duty military. High undergraduate biochemistry grades and starting graduate

Table 11

Learner Characteristics for Nutrition and Dietetic Majors at ISU

Category	ISU Dietetics and Nutrition Majors*
Demographics	• 18-35 years of age. • 98% female. • Mostly Caucasian, one Native American, and one Hispanic/Latino student. • All fluent in the English language.
Social Traits	• The majority hail from Idaho or surrounding states. • The majority are living on tight budgets; thus, financial security is a looming cloud. • Work experience spans 2 to 10 years. • 100% use technology for various tasks, all have Internet access. • The most common reason for selecting major is to help others. • Need safe place for role play and try new skills. • Personal comfort level and natural abilities for employing counseling techniques and exploring personal issues with others vary.
Entry Requirements	• High school graduate with at least a B grade point average (undergraduate students). • Admitted to Didactic Program in Dietetics (DPD). • College graduates with a degree in nutrition or related field (graduate students). • Participate in a national match for MS/Dietetic Internship program.
Academic Information	• Upper-division students with at least a cumulative B average in prerequisites. • Fulfilled ISU GERC plus DPD prerequisites. • About one-third are transfer/second-degree students. • The educational program includes an introduction to different practice settings, specifically, clinical, community, and foodservice management. • Predominately highly motivated learners, though there are some exceptions. • A small number of students have accommodations due to disabilities (typically, additional time for taking quizzes and tests). • Generally, enjoy learning via small group activities. • Lack confidence in professional scope of knowledge and practice. • Unfamiliar with scope of practice of other professionals.

*The categories of learning characteristics overlap. On this chart, data were only recorded once.

programs soon after taking the Graduate Record Exam (GRE) were the primary success factors. Odds of optional performance decreased by a factor of 0.2 times for each grade point decrease in biochemistry grade. In addition, student performance declined by 4.5 times with each year between taking the GREs and start of combined MS/DI graduate program.

Hughes and Desbrow (2005) explored the attitudes, expectations, and career plans of aspiring dietetic students. Students in the study compiled a list of 20 competencies (knowledge, skills, and attributes) they thought were required to be an RDN. Competencies included nutrition knowledge, autonomy, communication, interpersonal skills, empathy, teamwork, as well as organizational, pedagogue, and counseling skills.

Both Mitchell et al. (2005) and Schrader et al. (2004) evaluated the learning styles of nutrition and dietetic students. Mitchell et al. (2005) concluded that four learning styles were equally distributed: (a) accommodators—prefer hands-on experiences, rely on intuition rather than logic, (b) divergers—learn through observation, brainstorming, and information collection, (c) assimilators—organize information into logical categories and develop theories, and (d) convergers—pragmatic; employ deductive reasoning to solve a problem.

Schrader et al. (2004) found that students attending online programs preferred learning by doing. They enjoyed their interdependence and preferred flexibility in didactic programming. Two types of learning styles were common among virtual students—assimilator and accommodator Table 12 details the learner characteristics of students compiled from the literature.

Table 12

Learner Characteristics Compiled from the Literature

Study	Learner Characteristics			
	Study Aim	Demographics	Findings	Comment
Clark et al. (2017)	• Identify graduate student traits predictive of program success	• Mean age 26 years • 65% female	• Odds performance declined: – 0.2 times with each decrease in biochemistry grade – 4.5 times with each year between GRE and graduate program start	• Active-duty military, 94% US Army
Hughes and Desbrow (2005)	• Explore attitudes, expectations, and career plans of aspiring dietetic students	• 84% mid-20s, 16% mature age • 87% female • High GPAs	• 20 competencies identified by students needed to be a dietitian	• Passion for nutrition • Help others improve health • Combination of two
Mitchell, et al. (2005)	• Compare learning styles of dietetic students and faculty	• 69%, 21-26 years • 92% female • 90% white	• Four learning styles equally distributed among students	
Schrader et al. (2004)	• Compare learning styles and cognitive behaviors of distance vs. campus-based dietetics students	• 26-39 years • 100% female • 75% second degree	• Learn by doing • Assimilator/accommodator • Conceptualization • Prefer independence and flexibility	• Strong interest in subject matter

GRE = Graduate Record Exam

Focus Group Insights on Learners. Four themes emerged about the learners from the focus group: (a) exposure to IPE, (b) enjoyment of IPE activities, (c) lack of understanding about roles of IPP team members, and (d) the need to instill confidence in knowledge and competence.

Nutrition and dietetic students are currently exposed to interprofessional educational experiences. Also of note, students were positive about their experiences with

IPE. Both undergraduate and graduate nutrition and dietetics students noted that the most prominent learning need was a lack of familiarity with the scope of practice of different health professions.

Commentary by other health professions students, practitioners, and faculty highlighted the importance of students building more confidence in their role—and demonstrating that confidence when collaborating on IPP teams. This sentiment was also echoed by a family member of an adolescent patient. A graduate student who was also a practicing clinical dietitian emphasized the need for students in other health disciplines to also learn about the scope of practice of dietitians. Table 13 highlights learner characteristics collected from the focus groups.

Task Analysis

The first step of the task analysis involved compiling a list of other individuals that dietitians may work with on IPP teams. The second step analyzed, prioritized, and compiled a comprehensive list of the needed knowledge, skills, and competencies for effective interprofessional collaboration.

Interprofessional Practice Teams that Include Dietitians. IPP collaborations were reliant on the practice setting. Clinical RDNs (inpatient and outpatient) interact with different health care providers, administrators, and patients/caregivers/family members. Specific health care providers varied greatly—for example, an RDN working with individuals with eating disorders would interact with psychologists and psychiatrists. A dietitian working with patients on nutrition support, in contrast, collaborates with pharmacists. Community dietitians often work with IPP teams that include public health officials, school district superintendents, and marketing communications professionals.

Foodservice management dietitians team up with other administrative managers, technology experts, and kitchen staff.

Table 13

Learner Characteristics Collected from the Focus Groups

Exposure to IPE	I feel like we do get quite a bit of IPE in our first two years of college when we're in nutrition classes … [also] with students from other majors like the biology classes—those are with a lot of pre-med and pre-nursing students. So, I think we do learn how to interact with them. But when it comes to specifically their scope of practice, when we're thinking about the clinical setting [it's] probably only once a year. (Student, Dietetics Program) They would do it daily. The dietitian. pharmacists, nurses, doctor and social work. And, PT and OT. All would get together. and it was a really good collaboration. (RDN, Clinical Setting)
Students Enjoy IPE Activities	"We had a lot of guest speakers during my undergrad[uate program] and I feel that was super effective." (Graduate Student, Nutrition Program) A seminar style class would be really interesting with students from other health professions." (Student, Dietetics Program) I know for me personally I want to do what's best for the client or patient. I think working together as a team can provide a lot more education as well as different viewpoints. And so, I think it's a great way. (Graduate Student, Nutrition Program)
Lack of Understanding About Roles of Team Members	I had a pretty good idea of what the nurses did and what [the] doctors did [but] outside of that, I was not confident what other professions really [did, or] what their scope [of practice] was. (Graduate Student, Nutrition Program) I had a huge challenge with a PA. They wanted me to write a referral for a GI consult and I talked to her three times explaining, I cannot write a referral…So, helping them understand our scope is really important. (Graduate Student, Nutrition Program) A kid is going to trust somebody who's more confident than mousy. (Family Member)
Need to Instill Students with Confidence in Knowledge and Competencies	You're hired as a nutritionist to help this multidisciplinary clinic. Tell them why you're there and what good you are to them. (Faculty Member, Health Professions Program) I would have them know what they do, what they have to offer my patients when I can refer my patients to them for what services. (RN and Graduate Student, Health Professions Program) All three of us mentioned the word confidence and I think that's a theme… giving students the confidence to go toe-to-toe with doctors even and say no, you can still eat eggs when you have high cholesterol. (RDN and Faculty Member, Nutrition and Dietetics Program)

Nurses, physicians, and speech therapists/pathologists were the most commonly discussed interprofessional team member for dietitians. Six out of the eight focus groups noted including patients/clients as members of interprofessional teams. Also often mentioned were occupational therapists, pharmacists, and physical therapists. Figure 5 graphs the frequency of groups mentioned as potential IPP team members. Table 14 is a compiled list of potential IPP members.

Figure 5

Frequency of Professions Mentioned as IPP Team Members

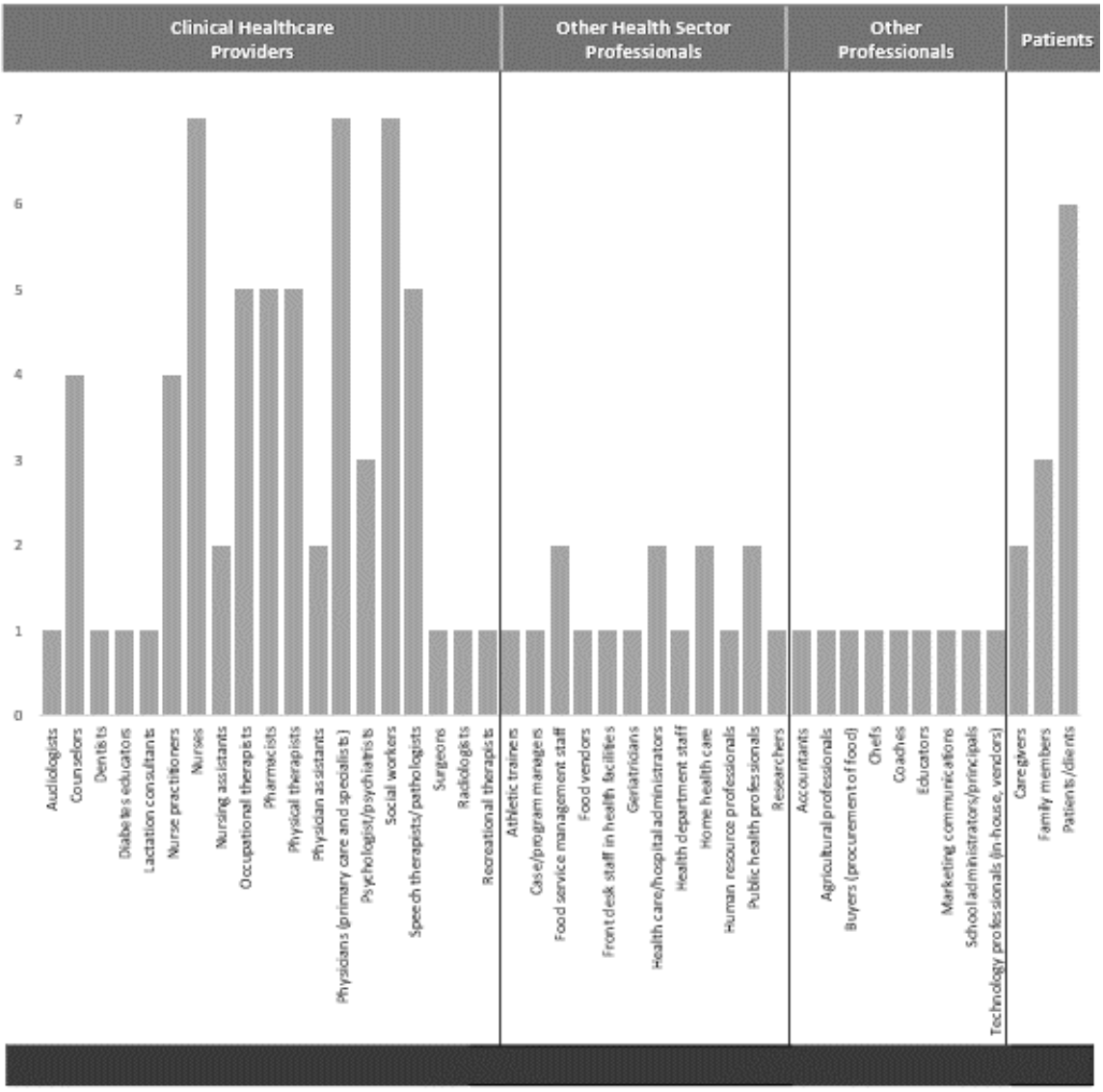


Table 14

Potential IPP Team Members Stratified by Focus Group

IPP Team Members	Focus Group Participants							
	Students		Faculty		Administrators		RDNs	Patients
	NUTR	Other	NUTR	Other	FSM	Other		
Audiologists					X			
Counselors/therapists	X			X			X	X
Dentists			X					
Diabetes educators	X							
Lactation consultants	X							
Nurse practitioners	X	X		X				
Nurses	X	X	X	X	X	X	X	
Nursing assistants			X				X	
Occupational therapists	X	X	X		X	X		
Pharmacists	X	X	X			X	X	
Physical therapists	X		X		X	X	X	
Physician assistants	X			X				X
Physicians	X	X		X	X	X	X	X
Psychologist/psychiatrists	X	X					X	
Social workers	X	X	X	X	X	X	X	
Speech pathologists	X	X	X		X	X		
Surgeons	X							
Radiologists			X					
Recreational therapists					X		X	
Athletic trainers							X	
Case/program managers							X	
Coaches							X	
Foodservice staff	X				X			
Food vendors					X			
Desk staff in health facilities			X					
Geriatricians							X	
Health care administrators			X		X			
Health department staff						X		
Home health care			X			X		
Human resource staff					X			
Public health professionals			X	X				
Researchers			X					
Business analysts					X			
Agricultural professionals						X		
Procurement staff					X			
Chefs					X			
Educators			X					

FSM = Foodservice management
NUTR = Nutrition and dietetics
RDNs = Registered dietitian nutritionists

Table 14 , continued

Potential IPP Team Members Stratified by Focus Group

IPP Team Members	Focus Group Participants							
	Students		Faculty		Administrators		RDNs	Patients
	NUTR	Other	NUTR	Other	FSM	Other		
Marketing communications						X		
School administrators					X			
Technology professionals					X			
Caregivers		X					X	
Family members				X			X	X
Patients/clients	X	X		X		X	X	X

FSM = Foodservice management
NUTR = Nutrition and dietetics
RDNs = Registered dietitian nutritionists

Review of Knowledge, Skills, and Competencies

Members of each focus group prioritized a list of knowledge, skills, and competencies compiled from the literature. They also suggested missing elements. The construct of a spectrum of knowledge, skills, and competencies was offered.

Knowledge. Participants in all eight focus groups identified the following six knowledge topics as essential for being effective members of IPP teams: patient-centered care, professional scope of practice, roles of other team members, work of interprofessional teams, cost of care, and translational research. Table 15 supplies quotes from focus group participants supporting this finding.

Ethics was prioritized in many of the focus groups and described as a universal concept for all members of the IPP team. Within the framework of ethical behavior and care, the importance of knowledge about diversity and implicit bias was noted. The expansion of "scope of practice" to include "scope of knowledge" was advised.

Table 15

Priority Knowledge Topics Identified by All Focus Groups

Patient-Centered Care	Patient-centered care is super important when we're considering knowledge because of… all the other factors that go into health care (convenience, time, and affordability). I think it's really important to have that mindset when looking at each patient individually and conveying that to other health care providers on the interprofessional team. (Graduate Student, Nutrition Program) They treated me like somebody worthy of the information and the time. They were always very gracious with their time. (Family Member)
Professional Scope of Practice	I would say that the professional scope of practice is huge because that's how I understand what you can do, and you understand what I can do and how we can coordinate those efforts best. (RDN, Foodservice Management)
Roles of Other Team Members	I would say, especially within the team, knowing your scope of practice and the roles of the other people within the team really makes communication more efficient and effective. And, at the end of the day, that leads to better patient-centered care that has greater health outcomes. (Graduate Student, Health Professions Program)
Work of Interprofessional Teams	Understanding the structure… of the interprofessional team. How is it set up? What are the ingredients? Are we really doing interprofessional collaboration? Are we doing one of the other varieties of things? (Faculty Member, Health Professions Program)
Cost of Care	We spent a lot of time and money on her, and I'm not super sure she moved the needle with him. (Family Member)
Translational Research	I was thinking translational research, it's big in my particular area… actually. in every area that I have practiced in. (RDN, Outpatient Setting) I would say something important is to keep up to date on evidence-based practice and realize you're a member of the team that has really important information. (Graduate Student, Health Professions Program)

Comments from a mother of an adolescent son with anorexia nervosa supported that suggestion. The need for students for a better understanding of the business of dietetics (e.g., funding sources and costs of care) emerged. RDNs working in all practice settings shared this sentiment. Another theme was knowledge of technology. The administrative RDNs emphasized the significant degree of automation now employed for back-end operations. Table 16 supplies quotes from focus group participants supporting these findings. Table 17 provides a list of knowledge topics stratified by stakeholder groups.

Table 16

Other Priority Knowledge Topics

Ethics	I think an ethical approach [is] a core value that we all have. And I think it is a way to connect us all in a team and get us on the same page. (Administrator, Health Care Sector) The other biggie in this group is ethics. I think everything that we do as health professionals needs to come down to the reason [that] we're doing it…I feel confident saying that every scope of practice for every discipline has their own code of ethics. So, I think that's a base foundation for every discipline. (Graduate Student, Nutrition Program)
Diversity and Implicit Bias	Recognizing our biases or different cultural [backgrounds], different cultural components of everything of life. (Faculty Member, Nutrition and Dietetics Program)
Scope of Knowledge	I think the term "professional scope of practice" is a little narrow. When I think of the scope of practice for physicians, it's about what they do—histories, physical exams, deliveries, sewing up wounds… I think that the [professional] body of knowledge [also needs to be included]. (MD and Faculty Member, Health Professions Program) They had to understand the eating disorder disease. They had to know the pathology—that it's a mental illness, all of its manifestations, all the nutritional impacts, the malnutrition that happens. (Family Member)
Business of Dietetics	I would put a pretty strong emphasis on the cost of care [and] the business aspect [of dietetics]. I don't think we get enough of it in dietetics. (RDN, Foodservice Management) I've really been trying to give my interns a business orientation… [and] how to start a business and do coding. I definitely think that's lacking. (RDN, Outpatient Setting)
Technology	I would like to focus on technology. I'm an informatics dietitian… whenever we have interns come in, they are completely blown away about the amount of technology that we use in our food service department. (RDN, Foodservice Management)

Table 17

List of Knowledge Topics Stratified by Focus Group

Knowledge Topics	Focus Group Participants							
	Students		Faculty		RDNs		ADMIN	Patients
	NUTR	Other	NUTR	Other	C&C	FSM		
Knowledge topics compiled from the peer-reviewed literature								
Community health			X		X	X	X	
Cost of care	X	X	X	X	X	X	X	X
Ethics	X		X	X	X	X	X	X
Health literacy			X		X	X	X	
Patient-centered care	X	X	X	X	X	X	X	X
Professional scope of practice	X	X	X	X	X	X	X	X
Roles of other team members	X	X	X	X	X	X	X	X
Translational research	X	X	X	X	X	X	X	X
Work of interprofessional teams	X	X	X	X	X	X	X	X
Additional knowledge topics compiled from the focus group findings								
Advocacy							X	
Business of dietetics					X	X	X	
Counseling theories								X
Diversity and implicit bias			X		X	X		
Leadership				X			X	
Pedagogue		X		X				
Professional scope of knowledge				X				X
Technology/informatics	X					X		

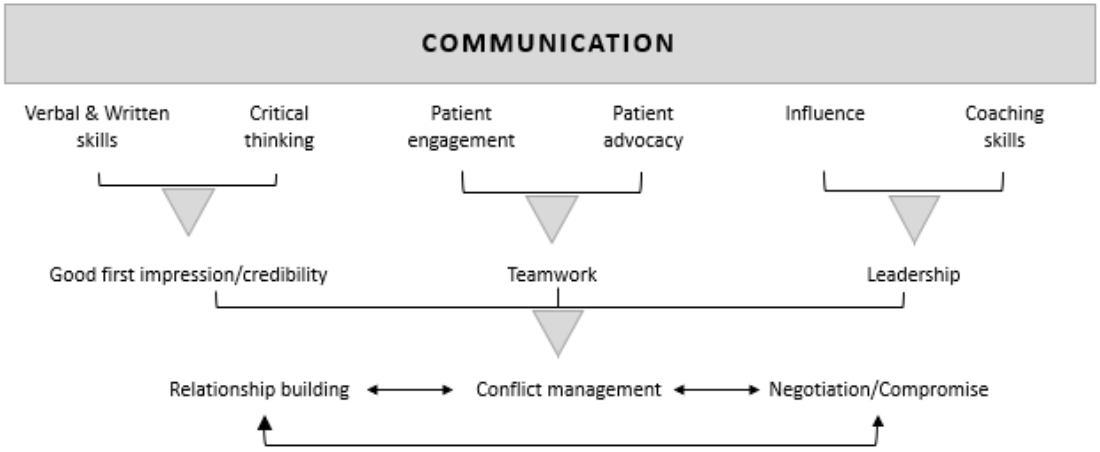
ADMIN = Administrators in the health care sector
C&C = Clinical dietetics and community nutrition
NUTR = Nutrition and dietetics
RDN = Registered dietitian nutritionist

Skills. required to be an effective member of an IPP team. Many participants described communication as an umbrella term and provided examples of the other skills that were subsets of communication. See Figure 6 for a depiction of the concept and supporting participant quotes. All of the focus groups identified teamwork and conflict management as essential skills. The importance of recognizing that the leader on the team may not be reflective of the organizational hierarchy was also noted. The suggestion to

include negotiation training in the didactic curriculum was made by one of the students majoring in nutrition.

Figure 6

Focus Group Findings Depicting Communication as an Umbrella Construct



If you are charting, sometimes that can be your first impression and I think communication is verbal and written. And in teamwork, I think it brings that all together. And you have to negotiate, and you have to manage conflict. So, to me, communication is an all-encompassing thing. (Faculty Member, Nutrition and Dietetics Program)

I feel communication covers a lot of those like negotiation and patient engagement. (RDN, Outpatient Setting)

I agree with communication. Being able to advocate for your patient and compromise. Those are all… really just communication. (Faculty Member, Nutrition and Dietetics Program)

One of the ones that I'm surprised is not here is relationship building…What are the ingredients of that? One of them is communication. (Faculty Member, Health Professions Program)

It's really important to have patient engagement because that's a big part of communication when we're thinking about interprofessional, skills. (Graduate Student, Nutrition Program)

I think that the influencer part of leadership… includes communication. (Faculty Member, Health Professions Program)

In the skills section… for both leadership and working as a dietitian is coaching skills. I think that could come under communication. (Administrator, Health Care Sector)

Several skills not included on the list compiled from the literature were also discussed. The first is pedagogue. The need for RDNs to be able to articulate and demonstrate their scope of practice and value to the interprofessional team emerged in two of the focus groups composed of "other" health professionals. Emotional intelligence was an added umbrella skill suggested. Barreiroa and Treglowna (2020) defined emotional intelligence as "a set of self-perceived abilities or perceptions concerning the way individuals identify, make use of, deal with, and process emotions." Several focus groups recommended the addition of problem-solving as a necessary skill. Professionalism was mentioned as a skill to hone and demonstrate during an IPE activity and in the practice setting. Based on focus group findings, the traits of professionalism included punctuality, reliability, time management, respect for others, respect for other's time, consistent performance, and being responsible. Table 18 supplies quotes from focus group participants supporting these findings. Table 19 provides a list of skills stratified by stakeholder group.

Table 18

Additional Required Skills Compiled from the Focus Groups

Pedagogue	Pedagogy ability to teach colleagues what you do and to share your knowledge with other people … I think that's a really important skill. (MD and Faculty Member, Health Professions Program)
Emotional Intelligence	And I don't know where emotional intelligence fits, but I love that idea. If it's part of leadership and teamwork, I suppose it could be a subcategory of that … Maybe humility … conflict management … It's a larger construct or constructive several of these. (RN and Faculty Member, Health Professions Program)
Problem-Solving	One that I'm really shocked is not on the [list of] skills would be problem-solving. I feel that's huge. (Student, Nutrition Program) One that I suggest would be problem-solving … being able to problem-solve or be engaged with others in solving a problem is critical. (RDN, Foodservice Management)
Professionalism	They have to demonstrate professionalism ... it shows up in areas like timeliness. You show up on time, so you don't waste other people's time. (Faculty Member, Health Professions Program) Another skill I think about, especially with interns, is dependability, consistency, and punctuality. (Faculty Member, Nutrition and Dietetics Program)

Table 19

List of Skills Stratified by Focus Group

Skills	Focus Group Participants							
	Students		Faculty		RDNs		ADMIN	Patients
	NUTR	Other	NUTR	Other	C&C	FSM		
Skills compiled from the peer-reviewed literature								
Communication	X	X	X	X	X	X	X	X
Conflict management	X	X	X	X	X	X	X	X
Leadership/followership	X			X		X	X	
Negotiation/compromise	X		X		X			
Patient engagement	X		X		X	X		X
Technology	X				X	X		
Teamwork	X	X	X	X	X	X	X	X
Time management	X		X	X		X		
Writing skills	X		X		X			X
Additional skills compiled from the focus group findings								
Active listening			X		X		X	X
Adaptability/flexibility				X		X		
Advocacy			X					
Coaching							X	
Compassion			X					
Counseling/group dynamics					X			X
Critical thinking			X		X			
Emergency management						X		
Emotional intelligence				X				
Good first impression/credibility			X	X			X	X
Humility				X				
Pedagogue		X		X	X			X
Problem-solving	X	X	X	X		X	X	
Project management						X	X	
Professionalism*	X		X	X	X			X
Relationship-/trust-building			X	X				X
Self-reflection		X	X	X	X	X		

*Includes punctuality, reliability, time management, respect for others, respect for other's time, consistent performance, and being responsible

ADMIN = Administrators in the health care sector
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RDN = Registered dietitian nutritionist

Competencies. Three of the groups discussed the importance of all the competencies (compiled from the literature) to ensure RDNs can be effective members of IPP teams. Three competencies were unanimously essential per the focus group participants: (a) autonomy/self-esteem/interdependence, (b) confidence in knowledge, and (c) identify/respect other cultures. The comments offered by the participants illustrate how the first two items overlap. Identifying and respecting other cultures was discussed in the framework of both patients/family members and other IPP team members. Of note, the mother who took part suggested expanding the concept of respecting others to respecting others' experiences. In addition, participants recommended adding to this construct self-reflection about one's individual biases. Table 20 supplies quotes from focus group participants supporting these findings.

Table 20

Competencies Identified as Essential by Focus Groups

Autonomy/Self-Esteem/ Interdependence	One of the things that we see the most is lack of confidence about our own scope and where we are the experts. Because if you're with the DOs and nurse practitioners they go to school to be the experts on everything and… having the confidence to step up and say, no, this is what we should be doing. (Student, Nutrition Program)
Confidence in Knowledge	I think [dietetic] interns can sometimes struggle, especially when they are the only person representing [the] dietitians on the interprofessional team. If they are not confident in their knowledge and expertise, that's a problem. (RDN and Faculty Member, Nutrition and Dietetics Program)
Shared Decision-Making	Shared decision-making stands out because whether you're a dietitian, nurse, or pharmacist the patient's got to buy into the plan of care. (Graduate Student, Health Professions Program) Shared decision-making is standing out to me because in my role it's so important on a daily [basis].(RDN, Foodservice Management)
Identify/Respect Other Cultures	The [ACEND] 2022 new standards are… more about competent cultural competency, and also [about] understanding your own bias. (RDN, Foodservice Management) Cultural competence comes into play not only of the patients but of one another … I think that is a very important piece to consider. Not just identifying unique cultures, but to have cultural competence and to be able to work through those. (Faculty Member, Health Professions Program)

The importance of students having “comfort being challenged’ was echoed by many focus group participants. The ease with being questioned by other members of the IPP team, as well as patients and family members also emerged from multiple groups. Expanding the construct of “comfort being challenged” was suggested during two of the focus groups. One group discussed the need to extend the construct to include proactively seeking and providing feedback to team members. Another participant suggested expanding the concept to include comfort with change. Table 21 supplies quotes from focus group participants supporting these findings.

Table 21

Expanding the Concept of Comfort Being Challenged

Comfort Being Challenged	I'm looking at comfort being challenged… I really like it because I witnessed some providers that, when a patient challenges them, they are very comfortable. They're respectful in a way that they can discuss the patient's concerns without demeaning them or being hostile or fighting with them… (Graduate Student, Health Professions Program)
Comfort Being Challenged and Seeking Feedback	The idea of "comfort being challenged" is a little narrow. I think if you really want to learn, you've got to invite feedback. That's really what you're there for to make people comfortable [considering] a new way, "I should listen to this. And not take it personally.” (MD and Faculty Member, Health Care Professions Program)
Comfort with Change	I think I would change that to comfort with change. One thing that I see holds people back is their inability to adjust or accept change… And the reality is we live in a world where there's going to be volatility, uncertainty, and ambiguity. To me "comfort being challenged" is a subset of "comfort with change. (Administrator, Health Care Sector)

Another concept that all but one of the focus groups prioritized was shared decision-making. Based on the comments, it was defined as a collaborative process between the clinical team and the patient, as well as among an IPP team in community and foodservice management settings. The importance of professionalism also emerged as a competency. Elements of professionalism identified by the participants included punctuality, reliability, time management, respect for others, respect for other’s time,

consistent performance, and being responsible. Table 22 supplies a list of competencies stratified by stakeholder group.

Table 22

List of Competencies Stratified by Focus Group

Competencies	Focus Group Participants							
	Students		Faculty		RDNs		ADMIN	Patients
	NUTR	Other	NUTR	Other	C&C	FSM		
Competencies compiled from the peer-reviewed literature								
Autonomy, self-esteem, interdependence	X	X	X	X	X	X	X	X
Identify/respect unique cultures	X	X	X	X	X	X	X	X
Listening with care		X	X	X	X	X		X
Taking others seriously		X		X	X	X		X
Comfort being challenged	X	X	X	X	X	X	X	
Values				X	X	X	X	
Shared decision-making		X	X	X	X	X	X	X
Additional competencies compiled from the focus group findings								
Business of dietetics					X			X
Coaching							X	
Comfort with change							X	
Compassion			X					
Commitment continuing education	X							
Confidence in knowledge	X	X		X	X	X	X	X
Curiosity				X				
Ethics (demonstrate)			X	X				
Evidence-based practice				X	X			
Patient advocacy	X							
Patient-centered care (demonstrate)			X	X			X	
Problem-solving			X					
Professionalism*			X	X		X	X	
Relationship-/trust-building				X				X
Self-reflection, continuous improvement, bias awareness				X	X			
Teamwork (demonstrate)			X	X	X	X	X	

*Includes punctuality, reliability, time management, respect for others, respect for other's time, consistent performance, and being responsible

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Spectrum. In two of the focus groups, participants debated which elements fell into which category. They both decided that many of the items might be considered knowledge, skills, and competencies. The concept of a spectrum of building knowledge, demonstrating skills, and consistently performing competencies precipitated. Figure 7 depicts this concept and includes insights from faculty members of health professions programs about this concept.

Figure 7

The Spectrum of Knowledge, Skills, and Competencies

BUILD → DEMONSTRATE → CONSISTENTLY DO

Knowledge	Skills	Competencies
Principles of nutrition research	Conduct research; interpret and explain findings verbally and in writing	Translate research for patients and IPP team members
Principles of advocacy (how to advocate for self and others)	Publicly support or recommend a particular position	Advocate for patients Communicate RDN role on IPP team
Medical nutrition therapy, nutrition care process	Counseling and educating patients, caregivers, family members	Execution of the nutrition care process

Competencies… incorporate communication skills and knowledge of patient-centered care. They require demonstrating cultural competence and maybe listening with care.

I would also put ethics under competencies… It's one thing to know [about ethics]; it's another thing to do it and show it. Just knowing the ethical construct isn't as important as actually living it.

I wonder where patient-centered care belongs. I don't think of it as a body of knowledge. I think of it as a behavior, or an attitude, possibly a competency. Maybe it belongs in more than one of the other areas because it's something that you demonstrate in your attitude toward the patient and all the rest and has all kinds of implications. Like taking the patient's perspective in life, knowing what the meaning of the illness to the patient.

Instructional Strategies

Delivery of IPE events was discussed, including potential learning objectives, topics, when to include IPE within the academic program, and modes of instruction.

Learning Objectives. Participants were asked to complete the sentence, "upon completion of this interprofessional education program, students will be able to …" The following list of potential objectives was generated from those responses:

- Demonstrate engagement through active participation in the IPE activity.
- Explain interprofessional collaboration and/or practice.
- Articulate the scope of practice and knowledge of their profession.
- Provide examples of the unglamorous and difficult tasks that RDNs perform.
- Define and provide examples of the term social determinants health.
- Give an example of how RDN's consider the social determinants of health when developing nutrition care plans.
- Define patient-centered care.
- Provide an example of an RDN employing a patient-centered care approach.
- Discuss the roles and competencies of IPP team members that promote efficient assistance of your patient/client.
- Identify when to utilize and proactively bring in other professions.
- Explain why before they do things, how they evaluate the situation and the players involved.
- List their profession's priorities for a patient/client case study; negotiate three priorities with other members of the IPP team.

- Demonstrate …a better understanding of fluid volume deficit (signs and symptoms) for assessing malnutrition or severe weight loss.
- Discuss initial nutritional counseling steps to employ before referring a patient/client to another RDN who specialized in their nutrition problem.
- List the steps for engaging a patient/client with an interprofessional team without diminishing the trust they have established with that patient/client.
- Discuss how to lead and manage a foodservice operation, including how things work from the perspectives of different personnel (e.g., director vs. dietitian).

Several participants noted that a variety of factors influence the development of learning objectives. Examples included students' progress in the academic program and setting of the IPE activity. Table 23 supplies quotes from focus group participants supporting these findings.

Table 23

Academic Status and IPE Setting Influence Learning Objectives

Academic Status	It depends on where they are [in their program. The learning objective for] a first-year student [differs from that for] of a… fourth year [student]. Because we have a spectrum of knowledge, skills, and competencies…, learning objectives would evolve as the students learn and train. (Faculty Member, Health Professions Program)
IPE Setting	I think it depends on what your setting is. If you are in a classroom setting, you can… [have the students] cite examples. But then for skills, you have them demonstrate how they would have a specific kind of a conversation. I think those verbs are really important, from… Bloom's Taxonomy. (Administrator, Health Care Sector)

Potential Topics. No one potential topic for IPE activities was universally suggested; however, the topics did fall into two categories—general workplace topics and health specific topics. In the workplace topics category, three themes emerged: (a)

introduction to IPP (b) IPP in different practice settings, and (c) building skills/competencies. Included with the health specific topics list are the social determinants of health, interventions for specific populations, and controversial and current nutrition topics.

The compiled list mirrors the suggestion that precipitated from several of the focus groups; specifically, the recommendation to include interprofessional education opportunities that prepare students to practice in a variety of settings. The need for students to experience how clinical and foodservice RDNs collaborate was emphasized by several participants. Table 24 supplies quotes from focus group participants supporting these findings.

Table 24

Expanding IPE Beyond Clinical Settings

Foodservice Management and Community Collaboration	I think it would be interesting from an interprofessional perspective to have something that collaborates with food service and community organizations. [For example, with RDNs] who work in a grocery store or different organizations that have more of a food service [orientation]. (Student, Nutrition Program)
Beyond Clinical and Community Nutrition	This conversation is making me think more about how we need to expand our interprofessional events beyond clinical or even the public health and get more into other areas that might help dietitians or dietetic students see how they could be more involved. (RDN and Faculty Member, Nutrition and Dietetics Program)
Foodservice Management and Clinical Collaboration	When we talk about therapeutic diets and supplements, it is taught from that clinical perspective ... I struggle daily to loop our clinical dietitians into [the] barriers from the foodservice perspective. It is that business management piece… if they want another supplement, where are we going to put it in the storeroom, how do we add it to the software system, [what are the] allergies and diet, [how do we] document [for] compliance ease. Is it something that we're able to afford? Are we going to take a different supplement away? … [Clinical RDNs] don't realize that there's a whole stream of things behind the scenes that need to go on. (RDN, Foodservice Management)

Among suggestions for topics on health conditions, one participant emphasized the importance of including an IPE activity on eating disorders. She shared that the prevalence of patients presenting with these disorders was high. Another highlighted the importance of IPE lessons to better reflect the complexities dietitians face in daily practice. Table 25 provides quotes from focus group participants supporting these findings. Tables 26 and 27 provide compiled lists of general workplace topics and health specific topics suggested by the focus group participants.

Table 25

Developing Complex IPE Scenarios

Comorbid Conditions	We learned one disease state at a time like each different chapter in the textbook was a disease state and then you have patients that come in and they have five of those disease states. So how do [you] prioritize certain things? (RDN, Outpatient Setting)
Social Determinants of Health	Food insecurity, economics, and elder abuse are some of these things that we encounter day-to-day in practice that aren't in a textbook. (RDN, Outpatient Setting)
Complicated Patients	The patients we were seeing were not textbook patients. They were super complicated—very low health literacy, very low income, challenging [socioeconomic] factors compiled into one. I did not feel prepared coming out of school to handle these very challenging cases. (RDN, Outpatient Setting)

Table 26

Potential IPE General Workplace Topics Stratified by Focus Group

Potential Topic	Focus Group Participants						
	Students		Faculty		RDNs		ADMIN
	NUTR	Other	NUTR	Other	C&C	FSM	
Introduction to Interprofessional Practice							
Introduction to IPP				X			
Interprofessional practice models	X			X			
SOP/roles of IPP team members	X	X		X			
Teachings others about your profession				X			
Influence of nutrition on health				X			
Influence of nutrition on outcomes				X			
Patient-centered care					X		X
Behavioral change (uniform message)				X			
Rounds	X						
Resolving team conflict/SOP creep			X				
Shared visits					X		
Discharge planning teams					X		
IPP in Different Practice Settings							
Inpatient and outpatient scenarios	X		X		X		X
Community/public health nutrition					X		X
Foodservice management						X	
Interdependence of clinical and FSM						X	
Niche areas of dietetics practice	X						
Public policy			X				
Partners outside of the health care			X			X	
Long-term care/residential scenarios			X		X		
End-of-life/ no chance of recovery			X				
Skill/Competency Building							
Business of nutrition (coding, billing)					X	X	
Budgeting and resource management						X	
Emergency management						X	
Communication skills		X	X				
Conflict management			X			X	
Leadership							X
Negotiation	X						
Personnel coaching						X	
Values/ethic		X					X
Current topics (media-generated)					X		

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Table 27

Potential IPE Health Specific Topics Stratified by Focus Group

Potential Topic	Focus Group						ADMIN
	Students		Faculty		RDNs		
	NUTR	Other	NUTR	Other	C&C	FSM	
Behavioral Health							
Eating disorders (disordered eating)	X		X		X		
Substance abuse			X				
Cardiovascular Disease, Diabetes, Metabolic Syndrome, & Weight Management							
Diabetes	X	X	X		X		
Heart disease, hypertension, and stroke	X	X	X				
Hypercholesterolemia		X					
Metabolic Syndrome		X					
Overweight/obesity	X				X		
Developmental Disabilities & Neurological Conditions							
Developmental disabilities			X				
Intellectual disabilities			X		X		
Neurocognitive disorders					X		
Parkinson's disease			X		X		
Nutrition Support							
Refeeding syndrome					X		
Oncology & Organ Transplantation							
Head and neck cancer			X				
Transplant teams			X				
Social Determinants of Health							
Elder abuse					X		
Food insecurity					X		
Sociodemographic factors		X			X		
Interventions for Specific Populations							
Maternal and infant health			X				
Families and those group dynamics	X						
Geriatrics			X				
Sports nutrition					X		
Individuals with comorbid conditions		X			X		
Tailoring solutions to patient needs					X		
Nutrition Hot Topics							
Anti-inflammatory diets					X		
Controversial topics (probiotics)					X		
Current topics (media-generated)					X		

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Timing/Prerequisites. Probing on when to offer IPE events led to discussions about the (a) the value of frequent IPE activities, (b) influence of the type of program (DPD vs. CP vs. DI), (c) challenge of full student schedules, (d) disparate views on offering IPE during lower-division coursework. The clinical and community RDNs unanimously agreed that including IPE experiences often throughout the didactic training was optimal. A student echoed that sentiment, suggesting frequent IPE activities help motivate students. It was suggested that the type of accredited dietetics program determined when to incorporate IPE. Of note, one faculty member commented on how her school overcame that barrier; specifically, offering one hour of IPE every Friday during the academic year. Table 28 supplies quotes from focus group participants supporting these findings.

Table 28
When and How Often to Offer IPE Activities

The Value of Frequent IPE Activities	How often I'm thinking as she said, as often as possible. (RDN, Outpatient Setting)
	It would be really good to incorporate it here and there because it brings things [that go beyond] the regurgitation [of information] for an exam. They have to verbalize it in a way that makes sense to a group. (RDN, Outpatient Setting)
	We have an hour on Fridays in the academic year where there are no classes held. And, we have to schedule our IP on those Fridays, but that limits the number of events we can have. (RDN and Faculty Member, Nutrition and Dietetics Program)
Challenge of Very Full Student Schedules	The other thing that's been a challenge for us… is just finding a time…Our students are very involved in extracurricular activities. They're working in addition to going to school (RDN and Faculty Member, Dietetics Program)
	We're all trying to provide this comprehensive knowledge and experience for students, but…we just keep adding more and the amount of time they spend in these experiences, or their education doesn't get any longer. (RDN and Faculty Member, Nutrition and Dietetics Program)
Influence of Program Type	I think it also depends on…whether it's a DPD or Coordinated Program or DI. (RDN and Faculty Member, Nutrition and Dietetics Program)
	I think the competencies are mostly taught when you're in supervised practice…. (RDN and Faculty Member, Nutrition and Dietetics Program)
Wait until the supervised practice for real-world" experience	I think a lot of the things that are listed under knowledge are hard to teach in a classroom setting and they are just going to come from practice in a clinical setting because it's not textbook knowledge. (RDN, Outpatient Setting)

Different viewpoints emerged for the optimal timing and needed prerequisites for IPE activities. Some participants supported the concept of offering IPE events throughout the students' education (didactic and supervised practice). This translated to offering opportunities in introductory classes, upper-division courses, and experiential opportunities. Discussions focused on types of IPE programs and topics that might be incorporated into lower-division vs. upper-division coursework. Some participants felt that IPE activities were most valuable for students in upper-division courses. They noted that imposing the requirement to incorporate IPE into general biology, for example, can be challenging for those faculty members. In addition, these general requirement courses include students who are not enrolled in health professions programs. Furthermore, the students may not be ready for IPE during lower-division courses because they are not yet knowledgeable about their role as a health professional. The need to wait until the dietetic internship or other experiential "real-world" learning experiences was also discussed. Table 29 supplies quotes supporting/opposing offering IPE during the lower-division courses.

Instructional Modalities. Realistic, in-person, interactive scenarios were identified as most valuable for promoting learning about the nuances of IPP. Case studies and simulations were the preferred instructional modalities. Of note, the students participating in the focus groups were very positive about these modes of learning. Focus group participants stressed the importance of employing real-life scenarios and the value of embedding these into didactic coursework. Engagement of an interprofessional team of content developers was emphasized as a strategy to ensure the IPE scenarios are realistic.

Table 29

Quotes Supporting and Opposing IPE into Lower-Division Coursework

Advocates	Opponents
I think it's got to start early. So, it's how you're brought up in the profession—you were raised with an interprofessional approach. (Faculty Member, Health Profession Program)	Now we have to get all the science teachers to broaden their scope and to put in some little IPE component in their professional design of their course. You're talking about a huge system change. (Faculty Member, Health Professions Program)
It could be implemented into those 100 and 200 level classes. It would be beneficial to implement it as often as possible. Maybe light … in those earlier classes. Then as you're further along in the program, there's more of the application. It's more in-depth and/or more hands-on. (Administrator, Health Care Sector)	When you're in a four-year program, it's the last two years where they really getting into the role of nutrition and being a dietitian … it's years three and four. I think that would be where we start. (RN and Faculty Member, Health Professions Program)
I would say early on start with creating an understanding of what your scope is and where you would fit in with the interprofessional team. Then, as you progress through, begin working with other undergrads who are in an interprofessional setting. (Graduate Student, Health Professions Program)	I would say once they're in the 400 levels because they're starting to learn how to make recommendations and major disease states. So, I think if it's going to be something that's clinically based or patient-centered, then probably not until the 400 level. (Graduate Student, Nutrition)
I think you could infuse it all the way through. And it really does need to be a continuum if students are going to … [get something] out of the program. (Administrator, Health Care Sector)	Their last year when they that knowledge, incorporate [IPE] here because they have to recall information … They have to be able to verbalize it in a way that makes sense to a group. So, … at least those last two semesters. (RDN, Outpatient Setting)

One nutrition and dietetics faculty member noted that many faculty members do not have personal IPP experience. Thus, they are not familiar with the intricacies of participating as a member of an interprofessional team. A willingness to include a preceptor or other faculty member with direct IPP experience was noted as essential for the development of realistic IPE scenarios. The inclusion of patients/caregivers and preceptors in IPE activities was another strategy for mirroring the practice setting. Table

30 provides quotes from focus group participants supporting these findings. Table 31 lists potential instructional modalities stratified by focus group.

Housing health professions students in one building versus in siloed buildings across the college/university campus was suggested as a way to promote interprofessional interactions. Likewise, a university-based clinic was also mentioned as a potential learning modality.

Table 30

Suggestions on Instructional Modalities

Real-life Scenarios	Real-life experiences … the learning [during] my internship was a game-changer for me ... So, I think the more real-life experiences [students] get more out of (than the textbook lecture type of education). (RDN and Administration, Health Care Sector)
Case Studies, Simulations, and Role-Plays	I really like the case study idea and being able to work on a case study with other professionals or students in different degrees. I think that's a really good idea because then we're able to share ideas and hear different ideas, too. (Student, Nutrition Program) I agree with case studies. I think it would be really great to be able to practice in school [by] working with other health profession majors to … learn how to work with other people [and] also to learn to be more open-minded to others' ideas. (Student, Nutrition Program) "I like the case study idea and being able to work … with other professionals or students in different degrees … because then we're able to share ideas and … hear different ideas." (Graduate Student, Nutrition Program) "I think role plays are always good … [role plays] are uncomfortable, that can be good [for students]." (Student, Dietetics Program)
Interprofessional Development Team	All of the case studies that we utilized were pre-developed … [by] the faculty from the various disciplines and I mean all of these individuals had been practitioners in their respective fields and so we tried to make them realistic. In some situations, they were based on actual experiences that a practitioner had … Otherwise, it's not truly doing justice for the students. (RDN and Faculty Member, Nutrition and Dietetics Program) I don't mean this in any way ill, but a lot of our instructors haven't actually worked as an RD[N]. They are an RD[N], but they've never worked in any kind of a [practice] setting … the ethics or the role in teams or patient-centered care … they've never experienced that themselves. We have seen that as a little bit of a barrier. (RDN and Faculty Member, Nutrition and Dietetics Program)
Inclusion of Patients and/0r Community Members	One huge benefit to ours is it is geriatrics and so we have people who come in from the community, who could be caregivers, who could be recipients [of care] and they sit at the tables with the students. So, the students get the outside perspective as well. It's not just the professionals, it's much more because who are we all there for? (RDN and Faculty Member, Nutrition and Dietetics Program)

Table 31

Potential Instructional Modalities Stratified by Focus Group

Instructional Modality	Focus Group Participants						
	Students		Faculty		RDNs		ADMIN
	NUTR	Other	NUTR	Other	C&C	FSM	
Embedded in Didactic Coursework							
Group work*			X	X			X
Online discussion boards**	X			X			
IPP course	X	X		X	X		X
Guest speakers	X		X	X			X
Seminar with panels of potential IPP	X		X	X			X
Video recordings of IPP			X				
Virtual forums	X						
Case study exam questions					X		
Interactive Experiences During Academic Programming							
Case studies/realistic scenarios	X	X	X	X	X	X	X
Simulations (different settings)	X	X	X	X	X	X	X
Networking with students in other professions	X	X					
Roleplaying	X				X	X	
Health fairs			X				
Modeling			X				
Experiential Learning in Real World Practice Settings							
Shadowing (RDNs and others)	X	X		X	X	X	
Rounds	X			X			X
Dietetic internship	X			X	X	X	X
Interdisciplinary huddles	X			X			
Modeling			X	X			
University clinics		X	X	X			

*Builds teamwork, shared decision making, conflict management, time management, and communication skills
**Fosters comfort being challenged

ADMIN = Administrators in the health care sector
C&C = Clinical dietetics and community nutrition
NUTR = Nutrition and dietetics
RDN = Registered dietitian nutritionist

Evaluation

The emerging preferences for evaluating achievement of the learning objectives for IPE activities were (a) self-assessment, (b) self-reflection, (c) peer review, and (d) debriefings. The influence of self-assessment on self-efficacy was highlighted by one participant. The nutrition and dietetics students described peer evaluations as impactful; their preference was for anonymous feedback. The concept of the 360 evaluations, where a group of colleagues whom an individual works with offer feedback was suggested as a way to provide an interprofessional evaluation. Debriefings were discussed in the faculty focus groups. These involve discussing the objectives before the IPE activity (pre-brief) and then, after the event, holding an informal group discussion to gather student perceptions of the event. Also of note, many schools evaluate both the student learnings and the delivery of the event. Table 32 supplies quotes from focus group participants supporting these findings.

Most of the participants did not recommend grading performance; both letter grades and pass/fail options were discouraged. Some faculty, however, noted that self-reflections were graded; albeit liberally. Others noted the value of rubrics to help evaluate the achievement of objectives. Also, whether to grade was dependent on the nature of the IPE activity. Two faculty members noted that assessment of the achievement of the competencies as the ultimate evaluation factor. The need for long-term, consistent demonstration of competencies was also noted. In that vein, the involvement of an interprofessional team in the student evaluation process was considered (reflecting the 360-evaluation concept). A standard evaluation tool utilized by all participating health profession programs was suggested. The importance of IPE experiences providing

realistic scenarios was also discussed. Specifically, the recognition that there may not be only one "right answer." In addition, concerns regarding the time commitment required to provide valuable, actionable feedback arose. Table 33 supplies quotes from focus group participants supporting these findings.

Table 32

Sample Comments Demonstrating Top Evaluation Preferences

Self-Assessment	An important piece is measuring specific knowledge, skills, competencies, and self-confidence. So, something at the end that asks if people feel like they've improved in these areas would be a good way to measure. (Student, Nutrition Program)
	[A self-review] is great. It is also important to realize that your feel more calm, more comfortable in these settings. (Student, Nutrition Program)
	The pre and post-test is great to test their knowledge. Take one before on the basic objectives and then take one after and see how much more they knew and then based on that you can also tweak the activity to incorporate more stuff if a lot of people missed out on certain objectives. (Student, Nutrition Program)
Self-Reflection	I tend to like self-reflections because I can review in my head what I would have done, what I could have done better, and what I did well. (Graduate Student, Health Professions Program)
	One of the things we have students do that's been helpful is … reflection about the challenges your team experienced not having someone representing a particular discipline. (RDN and Faculty Member, Nutrition and Dietetics Program)
Peer-Review	I definitely think [peer review is] a way to hold each other more accountable because I know when other people are looking at my work, I want to put my best foot forward. (Student, Nutrition Program)
	I like anonymous [peer feedback] because especially if you're in a smaller group you can still maintain that respect for one another rather than feeling singled out or possibly attacked. (Student, Nutrition Program)
	People who do best know how to perform within the team … So, I think do a peer evaluation… [the types of items to be evaluated might include] oral communication skills, respect for other team members. understanding their own scope of practice, understanding others' scopes of practice, health literacy, and some of those things. (Graduate Student, Health Professions Program)
	I feel [peer review] helps teach them to accept feedback from other people, which was one of the skills [identified]. (Faculty Member, Health Professions Program)
Debriefing	"You do a debrief afterwards and part of that debriefing is the interprofessional aspect of it from an evaluation standpoint. It's the degree of engagement in the discussion. Not so much about what they're saying.

Table 33

Evaluation Implementation Considerations

Interprofessional Evaluation	With IPE one thing I think about is the 360-degree evaluation. So, everyone's evaluating you and you're also evaluating yourself. I think this is where that reflection comes in. (Faculty Member, Health Professions Program) IPE is supposed to be taught by multiple professions, so I would hope that multiple professions are involved in the evaluation [process]. Thus, nursing isn't just evaluating the nursing students. (RN and Faculty Member, Health Professions Program) Multiple people giving you input is the thing that's going to stimulate that interdisciplinary team, the best. (RDN, Outpatient Setting) From the experiential clinical world, we get together as a group on a quarterly basis. All the faculty … and clinic management talk about every individual ... what they contributed to the team—did they show up, did they make the care better, did they waste people's time? And we come to a consensus of all the folks that are around them and I think it's really a helpful process. (MD and Faculty Member, Health Professions Program)
Standard Tool	Something I've read is … that there be central assessments [to evaluate if] the outcomes were achieved. So that all the stakeholders, all the disciplines are involved in creating one consistent evaluation tool. And that all the different disciplines use that same tool. (RDN and Faculty Member, Nutrition and Dietetics Program) We have one survey that all students regardless of their program complete, it is very much based on their perceptions. There's a Likert scale to [collect feedback on] to what extent the activity increased confidence. (RDN and Faculty Member, Nutrition and Dietetics Program)
Achievement of Competencies	The competencies are kind of the outcomes because [students demonstrate that they] can do that. This is what I should be seeing on a daily basis as you're providing care in that last semester or whatever it might be. (Faculty Member, Health Professions Program) A multiple-choice quiz can get a lot of those knowledge things. Skills get to be a little more involved. Competencies are really something that you have to kind of watch in a sustained way over time. I mean, that's really in a clinical rotation setting or an internship which isn't a one-time thing. (RDN, Foodservice Management)
No Right Answer	A lot of what we learn in school is hard and fast. I remember in simulations…if you didn't have the right answer verbatim you had the wrong answer. That's not how nutrition [practice] is by any means. (RDN, Outpatient Setting) It's definitely hard to … have there be certain [right] answers … because everyone does things differently. There might be a better way for some people and another way for other people. It could depend on available resources. (RDN, Foodservice Management)
Constructive Feedback is Time Intensive	There's always an issue with providing feedback in terms of who's going to read all of those reflections and then how is that, then brought back to the students [in ways] that they can actually learn from [it]. (RDN, Foodservice Management) As you move deeper into your program, that's where it becomes more labor-intensive to really give good constructive feedback. (Administrator, Health Care Sector)

Resource Considerations

The two faculty focus groups provided insights into the importance of colleges/universities increasing their tangible support for IPE activities. Emerging themes included funding streams, human resource considerations, accreditation requirements, student considerations, organizational norms, and organizational priorities. The lack of sustainable funding for IPE experiences emerged. Soliciting grant monies was a common approach embraced for covering some of the costs associated with the design, development, execution, and evaluation of IPE events.

The lack of funds to cover the faculty labor required to plan and execute the events also emerged as a barrier. Furthermore, faculty expressed a lack of recognition about the time required for planning and hosting IPE activities and, therefore, the failure of organizational policies to include these labor hours in faculty workload calculations. Others noted models where IPE experiences were integrated into university services (e.g., clinics) and faculty course releases were an option to accommodate the added workload. An additional human resource need was the necessity to collaborate across several departments, thereby, expanding the labor requirements. Faculty experience with IPP was also discussed as a benefit to the students.

Accreditation requirements were also identified as a potential obstacle to offering interprofessional experiential learning experiences. Student comments favored including IPE events often. Meeting the educational goals of the students is thus another resources consideration. For example, as noted above, enthusiastic discussion occurred among nutrition and dietetic students around the suggestion of offering one IPE experience for the three main practice areas of dietetics (clinical, community, and foodservice

management). In contrast, one student discussed the need to recognize the competing demands which may influence their acceptance of IPE experiences. The historical structure and operations of academic organizations also emerged as a barrier. Specific examples included teaching in siloed programs, organizational reporting, and the academic calendar. The value of taking time to compare curricula across the health professions to create IPE experiences that are optimally beneficial for all students was raised. The need for university-level support for IPE also precipitated. Extending this construct to create a truly integrated interprofessional approach to education was suggested. Table 34 supplies quotes from focus group participants.

Table 34

Focus Group Comments on Resource Considerations

Funding Streams	Funding is an issue we've experienced ... (RDN and Faculty Member, Dietetics) IPE events [at the] undergraduate level are funded through grants …But it is certainly a challenge, and it limits how much we can expand or how many events we can do. (RDN and Faculty Member, Nutrition and Dietetics)
Human Resources	It takes a lot of time and that is not appreciated. In terms of faculty load, it takes a long time to plan and coordinate these types of events. (RDN and Faculty Member, Nutrition and Dietetics Program) Our dean mandated for an IPE clinic. And so, he appointed one representative from each of the 11 departments. (RDN and Faculty Member, Dietetics)
Accreditation Requirements	The idea of us having one preceptor for each profession out there. I know it's required for accreditation, but it's a huge barrier. There's no reason that we can't be doing a lot of what we do on multidisciplinary teams but the precepting intensity that's required [can be a barrier]. *(*Faculty Member, Health Professions Program)
Student Considerations	I think it would be cool to have a public health IPE and also have a clinical IPE. I think having one per class subject. (Student, Nutrition Program) [IPE] took time away from the more urgent tasks that we had, like, studying for exams the very next day. (Graduate Student, Health Professions Program)
Organizational Norms	You're in your silo and you're expected to stay there and not really develop relationships outside of it. (Faculty Member, Health Professions Program) How do you organize classes across different colleges that everybody [needs to take]? How do you pull all these different educators out of those [silos]? (Faculty Member, Health Professions Program)
Organizational Priorities	I think we all have the intellectual support for IPE but there's got to be that tangible support. (Faculty Member, Health Professions Program) We should have some time set aside where all the professions are in the same room. (MD and Faculty Member, Health Professions Program)

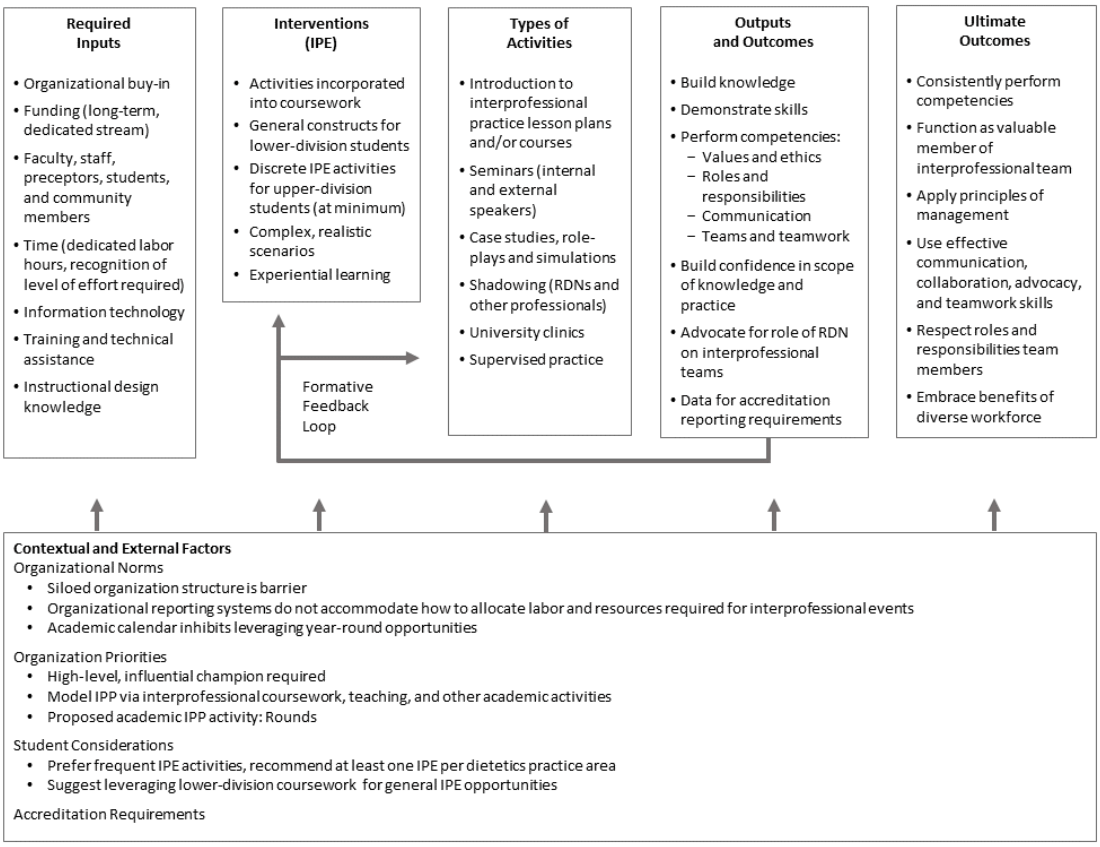
Logic Model

Figure 8 is a logic model depicting the relationships of the inputs and outputs required to achieve the desired outcomes and intended impact. The inputs include organizational buy-in, dedicated funding stream, human resources, training and technical assistance, and instructional design knowledge. The intervention is the inclusion of IPE into lower-division (general constructs), upper-division (complex, realistic scenarios) coursework, and supervised practice (experiential learning). A variety of activities can be employed (e.g., case studies, role-plays). The initial goals of building knowledge, demonstrating skills, and performing competencies are grouped into the IPEC competencies. An additional output is the data needed for accreditation reporting. The ultimate outcomes are the students consistently performing competencies, embracing the benefits of a diverse workforce, and achieving the ACEND IPE requirements.

The contextual and external factors influencing all of those factors are the organizational norms and priorities, student considerations, and accreditation requirements. A formative feedback loop runs from the outputs/outcomes to both the interventions and activities. This represents the flow of information to the students that aims to promote readiness for IPP. Specifically, the factors detailed in the modified version of Kirkpatrick's Typology such as the students' reaction to IPE, changed attitudes and perceptions, acquisition of knowledge and skills, behavioral change, and, ultimately, patient care improvements.

Figure 8

IPE Logic Model



Chapter V: Discussion

The goals of this research were to investigate (a) the interprofessional education (IPE) learning needs of nutrition and dietetic students and (b) evaluate how the 2024 master-prepared requirement impacts the interprofessional learner needs of nutrition and dietetic students. The study employed the Participatory Action Research and Systems Evaluation for Interprofessional Education (PARSE-IPE) conceptual framework. PARSE-IPE marries concepts from three domains—action research, instructional design, and interprofessional education.

The completion of this learning needs assessment involved document analysis, stakeholder focus groups, and the development of a logic model. During the document analysis step, accreditation requirements, learner characteristics, and required skills, knowledge, and competencies were compiled from the peer-reviewed literature. The eight focus groups employed perceptual triangulation and member-checking to help control bias and enhance the accuracy of the findings. The logic model maps the inputs and outputs required to achieve desired outcomes.

Deliberation of Findings

The findings of the learning needs assessment offer insights into five elements of learning needs: (a) learner characteristics, (b) tasks, (c) instructional strategies, (d) evaluation tools, and (e) resources. Recommendations on implementing sustainable IPE experiences for nutrition and dietetic students follow the discussion of the findings. Finally, the author reflects on the employment of the PARSE-IPE conceptual framework for this learning need assessment.

Learner Characteristics

Emerging themes for learners include demographic, social, entry, and learning characteristics. In general, students in nutrition and dietetics are Caucasian females. A recent national survey conducted by the Commission on Dietetic Registration (2021a) found similar results. The authors reported that students in nutrition and dietetics were primarily female (89%) and white (72%). Of note, efforts to diversify students wanting to become an RDN are underway by the professional organizations (Commission on Dietetic Registration, 2021a). In the meantime, IPE activities can offer students the opportunities to experience the benefits of a diverse workforce.

Students typically explain their desire to become an RDN as a drive to help others and a passion for nutrition. Another social characteristic that emerged from the focus groups was limited self-efficacy among students in nutrition and dietetics. Artino (2012, p. 76) defines self-efficacy as "a personal belief in one's capability to organize and execute courses of action required to attain designated types of performances" and notes that self-efficacy may be "described as task-specific self-confidence." A stakeholder story illustrated a lack of confidence among practicing RDNs. A nurse shared an anecdote about not knowing whom to contact to adjust the diet order for a patient in a long-term care facility. She raised the issue during an IPP team meeting. Given the RDN did not speak up during the meeting, she assumed it was not the role of a dietitian. To resolve the issue, she spoke with the administrator responsible for accounts payable. Focus group participants also emphasized the need to advocate for patients/clients and the profession. Health care providers (non-RDNs) shared the need for dietitians to proactively inform IPP team members of their scope of practice and encourage referrals.

Entry characteristics into the field are moderately competitive; applicants must have a minimum GPA in both the sciences and dietetics coursework. The findings of Clark et al. (2017) mapping biochemistry grade to performance emphasize the need for this entry requirement.

Mitchell et al. (2005) reported that the learning styles of nutrition and dietetics students were equally divided across Kolb's Inventory (accommodators, divergers, assimilators, and convergers). A study involving Romanian college students (n = 85; 18 to 51 years) investigated optimal teaching styles for these four learning styles (Tulbure, 2011). The researcher assessed students' learning styles using Kolb's Inventory and then applied a variety of teaching strategies. Students with different learning styles performed better with disparate teaching strategies; however, Tulbure (2011) warned to brace these findings with caution. Though these findings are preliminary, Table 35 maps learning style to potential IPE instructional modalities based on the current level of understanding. The table reveals that students with all learning styles should perform well in the preferred IPE instructional modalities (case studies, role-plays, and simulations). It also supports the finding by Schrader et al. (2004) that nutrition and dietetic students preferred learning by doing.

Table 35
Learning Styles Mapped to Instructional Modalities

	Accomodator Hands-on learning	Diverger Debating	Assimilator Problem-solving	Converger Investigating
Didactic lessons		X	X	X
Group work	X	X	X	X
Seminars (guest speakers)		X	X	
Shadowing	X	X	X	
Role plays	X	X	X	X
Simulations	X	X	X	X
Case studies	X	X	X	X
Supervised practice	X	X	X	X

Reinforcing the need to build self-efficacy was a finding that students require a safe place to role play and practice skills and competencies. Indeed, IPE activities have been found to help develop confidence. Holthaus et al. (2015), for example, engaged 70 nutrition and dietetic students in simulations conducted across three semesters; interprofessional colleagues included 540 students from other health professions and 11 faculty members. The authors reported a statistically significant increase ($p < .05$) in student self-efficacy providing nutrition care. In addition, student focus group participants and those in the Holthaus et al. (2015) study valued IPE. It enhanced their understanding of professional social and cultural dynamics and introduced them to different practice norms.

Tasks

The task analysis first explored the potential IPP team members. Of note, the compiled list is reflective of a suggestion that first emerged from the focus group with the nutrition and dietetic students. Specifically, to recognize that IPP extends beyond the clinical practice setting to the community and foodservice management practice settings. A self-report survey (n=240) measured the frequency of work-related interprofessional work teams among dietitians working in the public health setting (Hughes, 2004). The authors found that these positions "reported more multidisciplinary and inter-sectoral collaboration" than positions in the clinical setting. In the food service management realm, culinary medicine requires the collaboration of RDNs with health care providers, chefs, and kitchen staff (Lawrence, 2018). Focus group participants also included technology and other administrative support staff. Though potential collaborators vary based on practice setting, there is also overlap.

These findings suggest refining the selected definition for interprofessional practice (IPP). The one proposed by Ketcherside et al. (2017) focuses on "working with health care providers" and "the delivery of clinical care." Olson and Bialocerkowski (2014) also offered a definition focused on the clinical setting. A more appropriate definition for IPP within the scope of dietetics would be: Working with other professions and individuals/community members in the collaborative development of optimal solutions for patients and/or populations.

Two themes emerged from the task analysis of needed knowledge, skills, and competencies: (a) subsets of these elements sitting beneath umbrella construct and (b) viewing the required knowledge, skills, and competencies from the lens of a spectrum. Some of the proposed umbrella constructs were parallel to those of the Interprofessional Education Collaborative's interprofessional competency, i.e., communication and ethics.

Table 36 divides the list of knowledge, skills, and competencies across the four IPEC competencies. This table also demonstrates the concept of a spectrum in which students learn knowledge, hone skills, and consistently perform competencies emerged. Students learn about the principles of values and ethics, for example. Then, they apply those learnings by demonstrating compassion, humility, relationship building, and self-reflection. Finally, students consistently perform values and ethics (competencies) through compassionate care, comfort with change, listening with care, and taking others seriously. Within the roles and responsibilities fall the knowledge of dietetics, the business of dietetics, and the practice of dietetics. Students learn the science of nutrition and about nutrition research. They then are challenged to hone critical thinking skills and consistently employ evidence-based practice, interpret research for patients and IPP team

Table 36

Knowledge, Skills, and Competencies Stratified by IPEC Competency

	Knowledge	Skills	Competencies
Values, Ethics	• Diversity and implicit bias • Ethics • Values	• Compassion • Humility • Relationship/trust-building • Self-reflection (bias awareness)	• Compassion • Comfort with change • Values and ethics (demonstrate) • Listening with care • Taking others seriously
Roles and Responsibilities	Science of Dietetics		
	• Scope of knowledge • Translational research	• Critical thinking	• Evidence-based practice • Interpret research for patients and IPP team members • Commitment to continuing professional education
	Business of Dietetics		
	• Community health • Cost of care • Leadership • Work of IPP teams	• Emergency and project management • Leadership/followership • Problem-solving • Technology	• Collaboratively solve problems • Serve as project team lead/follower • Lead or participate in managing emergencies
	Practice of Dietetics		
	• Scope of practice • Patient-centered care • Roles of other team members	• Teamwork	• Autonomy/self-esteem/ interdependence • Confidence in knowledge • Patient-centered care (demonstrate) • Shared decision-making • Teamwork (demonstrate)
Communication	• Advocacy • Counseling theories • Health literacy • Pedagogue	• Active listening • Advocacy • Coaching • Conflict management • Counseling/group dynamics • Negotiation • Patient engagement • Pedagogue • Writing skills	• Coaching • Comfort being challenged and seeking feedback • Patient advocacy • RDN role education/advocacy
Teams and Teamwork	• Team dynamics • Leadership • Followership	• Active listening • Conflict management • Counseling/group dynamics • Negotiation • Patient engagement	• Coaching • Comfort being challenged and seeking feedback • Patient advocacy
	Professionalism		
	• Ethics • Diversity and implicit bias • Emotional intelligence	• Adaptability/flexibility • Good first impression (credibility) • Time management • Punctuality • Reliability/consistent performance • Respect for others and other's time • Being responsible	• Curiosity • Identify/respect unique cultures and experiences • Relationship/trust-building • Self-reflection (bias awareness, continuous improvement) • Shared decision-making

members, and ensure currency of knowledge through continuing professional education. As noted earlier, the Academy of Nutrition and Dietetics is shifting the curriculum to a competency-based model. The Accreditation Council for Education in Nutrition and Dietetics defines competency-based education as a curriculum guided by the student's ability to master the skills, abilities, and knowledge (competencies) required for the practice of dietetics (ACEND, 2016b). Organizational leadership explained that this embraces the learning philosophy utilized to educate and train students in other health professions programs. The proposed spectrum concept mirrors this shift in the educational approach.

Instructional Strategies

Instructional strategies were grouped into potential learning objectives, learning modalities, and evaluation. In addition, a list of potential topics was collaboratively developed by each focus group. Topics were categorized into general workplace and health specific concepts.

Learning objectives, instructional modalities, and evaluation. The need to ensure learning objectives are reflective of the student status in the academic program emerged. Of note, was the suggestion to craft learning objectives and assessments based on Bloom's Taxonomy. One health care administrator commented, “It’s all about the verbs.” Bloom’s is a system for developing objectives and assessments based on the levels of human cognition. (Krathwhol, 2002). For example, learning objectives for knowledge might require students to interpret nutrition information. Objectives for skills and competencies, in contrast, might start with the verbs correlate, plan, or design.

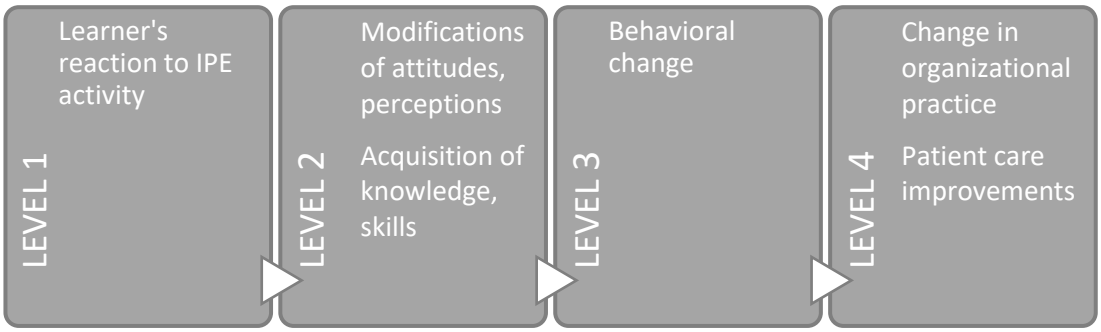
Preferred instructional modalities were case studies, simulations, and other interactive, experiential learning activities. A systematic review on the effectiveness of IPE concluded that students were satisfied with these types of problem-based learning strategies. (Might these focus group participants be assimilators?) In addition, participants noted increased knowledge, confidence with IPP collaborations, and enthusiasm for more IPE experiences (Guraya & Barr, 2018). The importance of realistic scenarios—developed by RDNs and other professionals with first-hand IPP experience—was emphasized. Inclusion of patients/caregivers/family members and preceptors was recommended to execute a realistic scenario. Another potential learning modality was the establishment of a university-based clinic. Copley et al. (2007) reported on the benefits and challenges of the IPE clinic at the University of Queensland. Benefits included increased awareness of patient concerns, confidence in the range of treatment options, understanding of the scope of practice and roles of other professions, knowledge about patient referrals, and teamwork skills. Challenges included the time required for collaborative planning and the increased need for flexibility and openness innate to teamwork. An additional challenge for training dietetic students in this setting is the lack of reimbursement for outpatient RDN services. This reality restricts the model of using health insurance payments to help cover clinic costs.

Kirkpatrick developed an outcomes evaluation typology which Reeves et al. (2015) adapted for IPE. Figure 9 provides that modified version of the typology. Level 1 (learner's response to the IPE activity) and the second half of Level 2 (acquisition of knowledge and skills) are the usual evaluation criteria for most IPE activities (Reeves et al., 2015). Research by Chen et al. (2019) supports this finding. This study limited the

examination of evaluation tools. The moderator's guide focused on the type of tools. The focus group discussions, thus, did not probe the substance of those tools. Despite this oversight, the employment of Kirkpatrick's Typology to ensure those tools fully explore the impact of the IPE exercise is recommended as a best practice.

Figure 9

Modified Version of Kirkpatrick's Typology



Among focus group participants, the pre-post design was favored for self-assessment instruments. A more formal test design was discouraged. Guraya & Barr (2018) reported on the efficacy of the pre-post evaluation tool for IPE activities. The authors found evidence supporting this design for enhancing student knowledge, skills, and attitudes about collaborative teamwork. A quasi-experimental design study aimed at identifying educationally meaningful instruction compared the effectiveness of self-review, peer review, and no formal review process (Covill, 2010). The authors concluded that self-review was more effective than peer review for improving student's performance. No benefits emerged of a formal vs. informal self-review (Covill, 2010). The nutrition and dietetics students, who participated in the focus groups, were positive about peer review. They described it as valuable for holding them accountable; however,

they preferred that peer review be anonymous. A study by Lu and Bol (2007) concluded that blinded peer review yielded better performance compared with face-to-face feedback from peers.

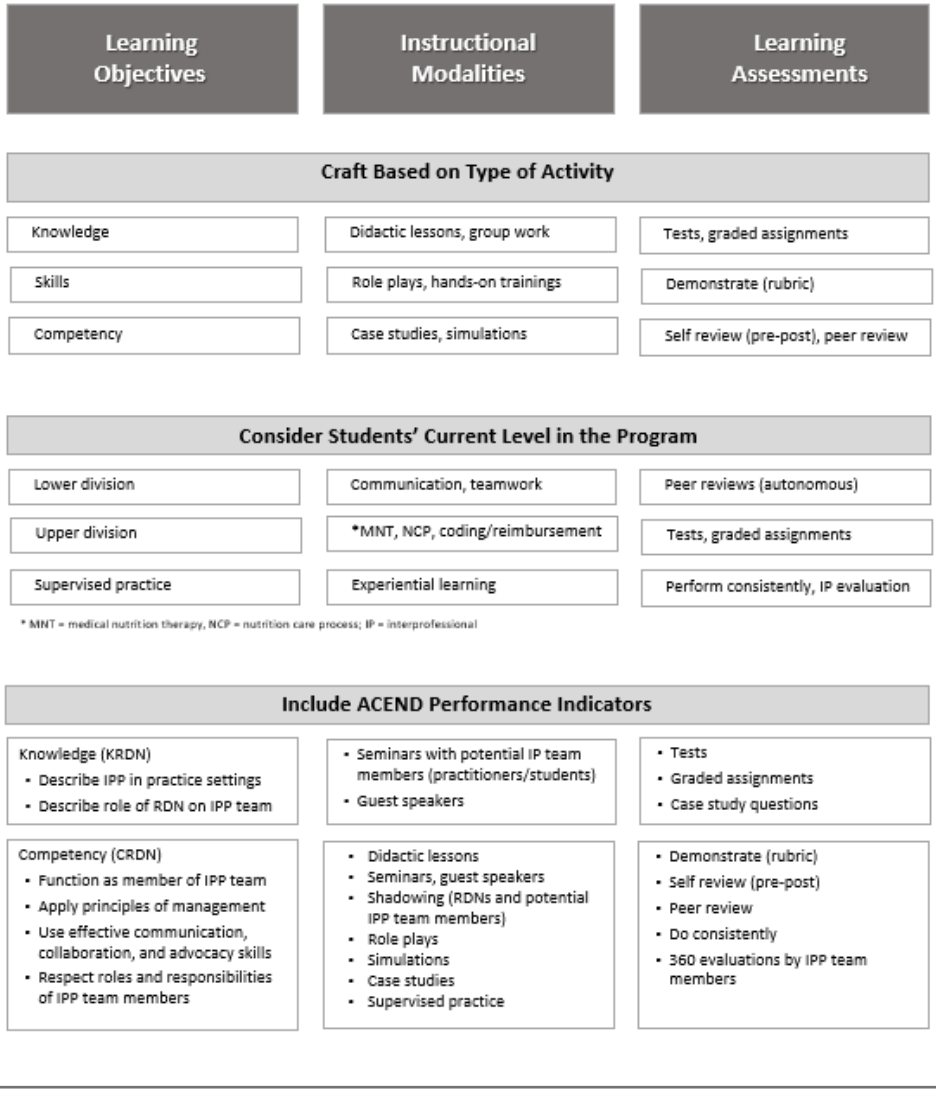
Ultimately, learning objectives, instructional modalities, and evaluation must be synergistic. Figure 10 maps the learning objectives to the instructional modality to the learning assessment. For example, IPE activities for students in lower-division courses might focus on communication and teamwork. Contrarily, upper-division IPE might focus on the scope of dietetic knowledge. Likewise, students obtain knowledge via didactic lessons and group work, which faculty evaluate via tests and other graded assignments. In contrast, students acquire competencies through case studies and simulations. Assessment tools for these learning modalities include self-review/reflection (pre-post format) and peer review.

Focus group participants also discussed mapping IPE objectives and assessments to accrediting body requirements. Thus, creating IPE activities that weave the ACEND requirements into the learning objectives and the ACEND performance indicators into the evaluation criteria ensures fulfillment of accrediting body mandates. Figure 10 illustrates this concept.

Potential topics and timing. A list of 57 potential topics was compiled (workplace = 31, health specific = 26). The workplace topics offer material for IPE activities in all three areas of dietetics practice. Of note, the desire to learn negotiation skills was mentioned by the focus group participants from nutrition and dietetics programs. One outpatient RDN commented on the need for students to be exposed to patients with comorbid conditions coupled with complex social issues. The suggested

Figure 10

Mapping of Learning Objectives to Activities to Assessments



topics also reflected the focus group finding spotlighting the need for IPE activities to provide information on the scope of practice of the various professionals engaged in IPP teams.

Disparate opinions arose regarding when to incorporate IPE into the academic program. The opportunity to hone knowledge and skills in lower-division courses may help address the barrier of overly full student schedules and curriculum requirements. For more real-world scenarios, waiting until students have developed their "knowledge of dietetics" was advocated by students, faculty, and practitioners. Some of the focus group comments reflected a heavy reliance on the dietetic internship/supervised practicum to develop competency in IPP teamwork. Given the extensive list of skills, knowledge, and competencies recommended, the need to include IPE during the didactic portion of the learning surfaces. Educators have already embraced this approach. An anatomy class at McMaster University was offered to students from multiple health professions programs. IPE was integrated into the course via a scope of practice presentation and case study discussion (Palombella et al., 2014). At Kansas State University, leadership and management skills are being taught through student involvement in clubs and other organizations (Canter & Kerschen, 2004). Appendix 2 contains a list of the potential topics and suggestions for when to introduce students to each topic (lower division, upper division, supervised practice).

Resource Considerations

Designing, planning, implementing, and evaluating IPE is a resource-intensive process. Holthaus et al. (2015) described a 10-month planning effort with weekly meetings including faculty from six health professions. Faculty spent time outside of the meetings reviewing the literature, working on case studies, and performing logistical tasks. Given this considerable level of effort, it is not surprising that a lack of requisite resources was a theme arising from the focus groups. Guraya & Barr (2018, p.164) also

documented this finding. The authors commented on the need for schools to make an organizational commitment to IPE. The authors state, “managing the growing number of students registered in each semester for these mandatory courses, scheduling, timetabling and allocating sufficient time, and finding appropriate teaching resources to meet cohort needs cohesive efforts by administration and faculty.”

Solutions for addressing those resource needs were (a) strategies for integrating knowledge, skills, and competencies into coursework (as discussed above), (b) leveraging the overlap across health professions, and (c) capitalizing on university clinics for real-world scenarios. Faculty participants discussed the challenges of leveraging curricula overlaps, including the siloed organization structure, reporting requirements, and accreditation standards. Universities, however, are finding ways to overcome those barriers. Other studies documented these challenges (Bladwin, 2007; O’Keefe & War, 2018: Patterson et al, 2007; Shakhman et al., 2020; Whyte et al., 2017). Bridges et al. (2011) highlighted the successful collaborative IPE curricula models at the Rosalind Franklin University of Medicine and Science, the University of Florida, and the University of Washington. Finally, the university clinic option is a natural solution; however, it mandates the need for internal or grant funding for nutrition counseling services. The reason is that reimbursement for outpatient RDN services is extremely limited.

Carney et al. (2018) state, “The bottom line is that an equitable, value-added financing model is required to ensure that all students and faculty experience benefits rather than disincentives to participating in IPE.” These authors propose three economic models for developing sustainable IPE programs that rely on student fees to cover IPE-

related costs. The generation of this new revenue stream can then be allocated to cover labor and other costs required for robust IPE experiences. The proposed models generate an annual IPE budget of $70,000 based on the collection of student fees ranging from $250 to $700 to variable. The question emerges as to whether students will find the investment in IPE experiences worth the additional tuition cost. One faculty member who taught a 1-credit IPE introductory course shared that the students were very positive about the course; thus, nominal costs may be acceptable.

Impact of 2024-Masters Requirement on Learning Needs

A CareerBuilder (2017 March) survey reported on the benefits of hiring college graduates over high school graduates. Positive outcomes included higher quality of work (61%), better productivity (51%), better communication skills (45%), and more out-of-the-box thinking (41%). Findings also revealed that about one-third of employers (33%) select applicants with a master's degree for positions that historically were filled by individuals holding a bachelor's degree (CareerBuilder). This illustrates that the expectations of master-prepared RDNs will be greater than those of bachelor-prepared RDNs. Thus, the ability to efficiently become a productive member of an IPP team emerges.

A relevant finding of the learner needs assessment is the need to build confidence; master-prepared RDNs will be expected to have higher levels of professional self-efficacy than those holding a bachelor's degree. Likewise for writing skills: first impressions may be associated will well or poorly written charting notes according to one of the RDNs in the focus groups. At a graduate level, writing skills are expected to be more refined. IPP team members may thus have higher expectations of the writing skills

of master-prepared RDNs. Furthermore, Clark et al. (2018) found that optimal graduate performance maps to biochemistry grade. The authors note that "as dietetics transition to an MS as a gateway to the profession, students must possess an academically solid foundation and strong critical thinking and problem-solving skills (p. 1062)." The Future Education Model which employs a competency-based model is more likely to prepare students for the elevated expectations of master-prepared RDNs.

Recommendations

Based on the findings of this learning needs assessment, ten recommendations were crafted. These recommendations offer actionable insights into offering sustainable IPE for students in nutrition and dietetics programs. Furthermore, suggestions on strengthening ACEND's IPE requirements are offered.

Ten Recommendations

1. Offer IPE frequently. Given the homogeneity of the profession, IPE activities offer an opportunity for nutrition and dietetic students to experience the benefits of diversity in the workplace. Consider scheduling regular monthly activity.
2. Leverage lower-division coursework to hone skills.
3. Engage RDNs with IPP experience in the development, execution, and evaluation of IPE experiences.
4. Make IPE scenarios real, include patients with comorbid conditions and complicating social dynamics, and recognize that multiple solutions may be correct.
5. Integrate opportunities to build confidence in the scope of knowledge, business, and practice, negotiation skills, and comfort with change/being challenged.

6. Incorporate IPE into each main area of dietetics education (clinical, community, food service management.
7. Offer an IPE activity that demonstrates the collaboration required between the clinical and foodservice teams of RDNs.
8. Employ existing tools for developing objectives and assessments (Bloom's Taxonomy, Kirkpatrick's Typology modified for IPE).
9. Lobby ACEND to mandate course release for faculty members significantly engaged in IPE development, planning, implementation, and evaluation.
10. Recruit an influential, upper-level IPE champion who can help organizational leaders commit to breaking down silos and secure a long-term funding stream.

Strengthening ACEND IPE Requirements

Table 37 stratifies the ACEND IPE requirements by the four elements of the IPEC interprofessional collaboration competency. To strengthen the importance of IPE and the KRDNs for the DPP/DI and CP program tracks, the inclusion of values and ethics as well as communication skills in the KRDNs are recommended. Given the emphasis on values and ethics across all the focus groups, the requirement to build knowledge and hone skills demonstrating values and ethics is warranted. Inclusion of knowledge of the value of a diverse workforce and the development of individual biases is recommended. Likewise, a KRDN for IPP communication would be valuable. This reflects the discussion during the focus group with faculty members from Nutrition and Dietetics programs. They discussed how a first impression, and thus an RDNs credibility, may be formed via communication (verbal and written).

Table 37

ACEND IPE Requirements Stratified by IPEC Competency

IPEC Competency	DPD/DI or CP Programs		FEM Programs	
	Knowledge	Competency	Competency	Performance Indicators
Values and Ethics			Unit 5: Leadership, Business, Management and Organization—5.2 Applies principles of organization management.	5.2.10 Understands and respects the roles and responsibilities of interprofessional team members.
Roles and Responsibilities	KRDN 2.2 Describe… interprofessional relationships in various practice settings.	CRDN 2.4 Function as a member of interprofessional teams.	Unit 5: Leadership, Business, Management and Organization—5.2 Applies principles of organization management.	5.2.10 Understands and respects the roles and responsibilities of interprofessional team members.
Communication		CRDN 2.4 Function as a member of interprofessional teams.	Unit 7: Core Professional Behaviors—7.2 Uses effective communication, collaboration, and advocacy skills.	7.2 Uses effective communication, collaboration, and advocacy skills.
Teams and Teamwork	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.	CRDN 2.4 Function as a member of interprofessional teams.	Unit 5: Leadership, Business, Management and Organization—5.2 Applies principles of organization management.	5.2.10 Understands and respects the roles and responsibilities of interprofessional team members 7.2 Uses effective communication, collaboration, and advocacy skills.

SOURCE: Accreditation Council for Education in Nutrition and Dietetics (2016a, 2016b).

The competency for the DPD/DI and CP tracks is broad enough to cover roles and responsibilities, communication, and teams and teamwork. However, a competency requiring students to perform actions reflective of professional values and ethics is lacking. The competencies and performance indicators for the FEM are more reflective of the IPEC competency. What is missing, however, from the IPE requirements for all of the program types is the need to consistently perform competencies. The IPEC elements employ verbs from Bloom's Taxonomy more indicative of the performance of competencies. For example, "collaboratively work with other professionals ... " versus "function as a member." Plus, the competency "understands and respects the roles and responsibilities of interprofessional team members" does not employ the best verbs for measuring consistent performance. Alternative verbs might be "articulates and values." Furthermore, reflecting on the IPE version of Kirkpatrick's Typology, a competency that reflects improvements in nutrition interventions for patients and populations is advisable. For example, defend nutrition care plans that yield improvements in patient/population outcomes.

Reflections on the PARSE-IPE Conceptual Framework

This study allowed for initial testing of the PARSE-IPE conceptual framework. Utilization of the framework embraced an interpretive approach for developing IPE activities by leveraging participatory action research and evidence-based instructional design principles. The PARSE-IPE model offered several strengths.

The embedded management steps of the instructional design Systems Model of Evaluation produced a structured and efficient collection of learning needs across three months. It also mandated the inclusion of both internal and external stakeholders. The

Participatory Action Research Spiral required employing a qualitative method and member checking to help limit research biases resulting from the interpretative approach. This plus adds credibility to the findings. The Participatory Action Research Spiral and Systems Model mandated engaging diverse stakeholders. These steps led to the insight that dietetic students and RDNs may have to articulate their value to other IPP team members. The need for dietitians to advocate for the value of the profession is an example of an "invisible" factor impacting learners' IPE needs.

The PARSE-IPE framework uncovered findings that would not have precipitated if an instructional designer only employed the IPE Color Wheel; for example, the role of students and administrators as facilitators and the need for interprofessional education beyond the clinical focus. Expanding IPE across all dietetic practice areas highlights the limitation of the definition of IPP promoted by Ketcherside et al. (2017). Thus, the conceptual framework collected valuable insights on some of the barriers to sustainable IPE programs. Infusing the insights gleaned on these factors into IPE activities can help break down those barriers.

Twelve factors (six internal and six external) were identified as barriers to sustainable IPE programs. Table 38 provides a list of those factors. The red boxes highlight the factors that the PARSE-IPE model appears to help address. By wedding evidence-based strategies, the PARSE-IPE overcomes the failure to employ proven models when designing IPE experiences. The inclusion of diverse stakeholder groups led to valuable revelations about social and cultural dynamics among health professionals. For example, the perceptions of other health professions and even patients (i.e., family members) that not just dietetic students but practicing RDNs do not appear confident in

their scopes of knowledge and practice. Students expressed the value of IPE in helping to understand different practice norms. Focus group participants noted that the scopes of knowledge and practice of various health professions overlap, highlighting the need for solid communication skills. Collaborating on who will do which task, thus, often requires savvy negotiation skills. The focus group findings also emphasized the need for adaptability/flexibility and realistic scenarios developed by professionals whose experiences can help students overcome the difficulty of implementing IPE concepts in various dietetic practice settings.

Table 38

Impact of PARSE-IPE on the Barriers to Sustainable IPE Programs

Internal Factors	External Factors
1. Inadequate resource allocation	1. Accreditation requirements
2. Turf-guarding: Struggles to form interprofessional teaching collaborations	2. Limitations of traditional, linear curricula models
3. Administrative resistance to new approaches	3. Conflicting practice norms of different health professions
4. No dedicated group of IPE champions	4. Social and cultural dynamics among health professionals
5. Lack of a long-term commitment to IPE experiences	5. Mixed practice models
6. Failure to employ an evidence-based model to design IPE experiences	6. Concepts difficult to understand and implement in the clinical setting

The most significant barriers to IPE are internal factors such as the lack of adequate resources, organizational structures that impede interprofessional collaborations, and accreditation requirements that can hamper innovation. Though the PARSE-IPE model produced discussions about these challenges, those conversations did not result in solutions. Perhaps a separate focus group dedicated to discussions on how to

overcome barriers would have yielded actionable solutions. Thus, IPE experiences relying on the findings would not have addressed these monumental barriers to sustainable programming. More testing is required to evaluate the efficacy of the PARSE-IPE framework across the full instructional design process.

Chapter VI: Conclusion

This study leveraged the evidence of instructional design to investigate the interprofessional education (IPE) learning needs of nutrition and dietetic students. It also explored the potential impact of the 2024 master-prepared requirement on those learning needs. Finally, it partially tested an innovative conceptual framework, PARSE-IPE, created to overcome the "wickedness" of IPE.

Learning Needs of Nutrition and Dietetics Students

The dietetics curriculum aims to prepare students to work in a range of practice settings; therefore, the IPE learning needs of these students are extensive. The initial scope of the research employed a definition of IPP that focused on the clinical setting. The student group, however, suggested the concept of offering IPE across the primary practice areas of dietetics (clinical, community, foodservice). During focus groups with community and foodservice management RDNs, queries on this concept revealed that interprofessional teamwork was the norm in these settings. Thus, a broader definition of IPP emerges for the practice of dietetics; for example, working with other professions and individuals/community members in the collaborative development of optimal solutions for patients and/or populations.

Nutrition and dietetic students are primarily Caucasian females drawn to the career field because of their desire to help others and a "passion" for nutrition. IPE activities may both introduce students to the value of shared decision-making and diversity in the workplace. Given the homogenous nature of the student body, this could be a tangential enriching benefit.

Development of learning objectives, modalities, and assessments can leverage existing resources such as the ACEND IPE accreditation requirements, Bloom's Taxonomy, and Kirkpatrick's Typology. The compiled knowledge, skills, and competencies map to the Interprofessional Education Collaborative's four core competencies: (a) ethics and values, (b) roles and responsibilities, (c) communication, and (d) teams and teamwork. Furthermore, the concept of viewing the required knowledge, skills, and competencies on a continuum supports the accrediting body's goal to shift to a competency-based curricula model.

Offering IPE activities frequently was suggested by students, as well as faculty and administrators. IPE activities might focus on general workplace and/or health specific topics. A workplace topic might be ethics, a health specific topic, the impact of the social determinants of health on the patient treatment plan. Optimally, IPE activities mirror real-life, complex scenarios prepared by RDNs with IPP experiences. Preferred evaluation tools were self-assessments/reflections (pre-post) and peer reviews (anonymous). Sustainable, rigorous IPE is advantageous for students and the field. The most monumental barrier is a lack of a dedicated funding stream. During the focus groups, solutions to this problem did not precipitate. The concept of an IPE-related student fee, however, was suggested in the literature.

The 2024 master requirement does not impact the interprofessional learner needs of nutrition and dietetic students; however, it does impact the degree to which students demonstrate competencies. Interprofessional colleagues and patients/clients/communities will expect graduate students to demonstrate competencies more skillfully than their bachelor's trained colleagues.

Further testing of the PARSE-IPE model is required to assess if it can help overcome the wickedness of IPE. This study demonstrated advantages in the learner needs data collection process; however, it failed to produce solutions for the funding challenges. The conceptual framework, thus, requires additional efficacy testing.

Appendix 2 provides a copy of the final learning needs assessment report.

Questions for Further Inquiry

Based on the scope and findings of this research prompt, additional questions for further inquiry precipitate, including:

- Given the homogeneity of the study sample, what is the transferability of the findings?
- How do the interprofessional learning needs of nutrition and dietetic students compare with those of their potential IPP team colleagues?
- Will students willingly pay an additional fee to provide the resources needed for robust IPE experiences?
- Will the PARSE-IPE conceptual framework ease the development, implementation, and execution of an interprofessional education program was beyond the scope?

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Appendix 1: Moderators' Guide and Focus Group Handout

INTRODUCTION (1 minute)

Welcome and thank you for being here today/tonight. In today's health care arena, health care providers work as teams to provide optimal patient care. The purpose of this gathering is to get your feedback on what dietetics students need to learn to successfully contribute to these interprofessional teams.

So, think of yourself as a member of a THINK TANK. I want to understand the knowledge, skills, and competencies that dietetic students must hone to work on these clinical teams. I also want to hear from your experience about what works and what does not work. I want to learn your opinions. There are no right or wrong answers.

I am a doctorate student at Idaho State University. In addition, I am an Assistant Professor in the Department of Nutrition and Dietetics at the ISU-Meridian campus. This research is for my doctorate dissertation. But I also hope it will offer unique insights for myself and other faculty of nutrition and dietetics programs.

PROCESS & GROUND RULES (1 minute)

As you are aware, this is an online gathering. We will meet for about 90 minutes. The meeting is being recorded for transcription purposes.

After the meeting, the cloud copy of the focus group will be destroyed. After transcription, the downloaded copy of the focus group will also be destroyed. The transcription will identify participants by study ID number and role, rather than name. In reporting results, your names will not be used.

A couple of ground rules:

- Please talk loudly enough so that everyone can hear you.
- Some of the information shared may be sensitive. All participants are asked to respect the confidentiality of the information discussed during the focus group.
- If you have any questions or additional comments, please go right ahead at any time and speak up. We have a good deal of material to cover in a short time; feel free to ask questions. That said, we will need to keep the conversation moving. So, in the interest of staying on time, my responses may be brief.

Any questions?

QUESTION SEQUENCING

Ice Breaker (I minute per participant, up to 10 minutes)

- We're going to be talking about students studying to be future dietitians. So, let's take a moment to introduce ourselves. Please share your name, role, and one thing that a dietitian does.

Introductory Question (10 minutes)
In the chat box, I put the definitions of interprofessional education, or IPE, and interprofessional practice, or IPP. I am going to take a minute to review those. Also, feel free to refer to these definitions.

- Think about a time when you participated in a health care visit or educational activity that included two or more health care providers:
  - Which health professionals were involved?
  - How did the health care providers work together?

Transition Question (10 minutes)

Let's talk more about interprofessional health care teams.

- Why do you think it is important that students learn about interprofessional care?
- Why might students be motivated to participate in interprofessional education programs?
- How else might students learn about interprofessional teamwork?

Content Questions (55 minutes)

Tailored to stakeholder groups. See below.

CLOSING QUESTIONS/DEBRIEFING (2 minutes)

- What else would you like to tell me about?
- Any additional thoughts? Anything we didn't cover that you think would be good to discuss?

WRAP UP AND THANK YOU (1 minute)

Next steps:

- I will prepare a summary of the meeting and send it to all of you for review.
- Please make sure that it accurately reflects your input. All edits and tweaks to this summary are really appreciated.
- Please remember that everything discussed during this meeting is confidential. At this time, I ask that you not share the summary with others.
- Once your feedback is received, I will email you an Amazon gift card as a token of appreciation for your willingness to participate in the study.
- Next, I will also send you a summary of the findings from all of the focus groups. You are free to share this final summary with others.

Any final questions? comments?

Students: Groups #1 & #2, Students, Nutrition and Dietetics & Other Health Professions Programs

As we discussed earlier, my goal tonight is to better understand the learning needs of health professions students with regards to preparing them to be effective team members of health care teams providing care for patients.

Learner Analysis

What are the characteristics of health professions students?

- Are you familiar with the scope of practice of different health professions?
- Based on the interprofessional experiences that you have participated in, what is the range of abilities of the different health profession students?
- How do you learn about the scope of practice of other health professions?
- What makes interprofessional education good from a learner's perspective?
- When is the instruction most meaningful? In other words, at what point during your schooling would it be best to include interprofessional education experiences? How often do you think they should be offered? Should IPE experiences be required?

Task Analysis

I emailed each of you a list of skills, knowledge, and competencies. This list was compiled from studies published on interprofessional education. I am going to share my screen and show you that list.

- I would like to find out how you rank the items on the list in order of importance.
- And, also, are there beneficial skills, knowledge, or competencies that are not included on the list?
- What is the sequence in which things should be learned?

Instructional Strategies

Thinking about interprofessional educational exercises, what are some topics that you think would benefit dietetic students?

- How should the topics be prioritized?
- List some potential learning objectives of those IPE exercises?
- Should there be prerequisites for participating in IPE exercises?

There are lots of ways to provide students with interprofessional education experiences:

- What instructional strategies are most appropriate?
- What are the most effective ways for you to learn about interprofessional teamwork?
- What types of activities would you suggest?
- What is the best way to present the information so that each learner will master the objective?

Evaluation

How should the achievement of the objectives be measured?

- Should students take pre-tests?
- How students demonstrate their understanding of the IPE learnings?
- Should there be a grade associated with IPE exercises? What types of elements should be scored?
- How do you determine if a student can translate IPE learnings into practice?
- How assess what students liked and did not like about the IPE experience?
- What is the role of peer evaluation of learning in IPE?

Resource Considerations

How often should IPE experiences occur in the course of the 4-6 years of academic preparation required to become a dietitian?

Faculty: Group #3 & #4, Faculty, Nutrition and Dietetics & Other Health Professions Program

As we discussed earlier, my goal tonight is to better understand the learning needs of nutrition and dietetic students regarding working on collaborative teams of health providers on the delivery of patient care.

Learner Analysis

- Why is interprofessional education required? Who requires it?
- What is the dietitian's role on the team? What are the other health professionals that dietitians typically collaborate with?
- Are other professionals who do not provide clinical care included on interprofessional teams?
- How prepared do you think the typical dietetics student is to participate in interprofessional teamwork?
- What is the range of abilities among learners?' How do you make the instruction meaningful for the students?

Task Analysis

I emailed each of you a list of skills, knowledge, and competencies. This list was compiled from studies published on interprofessional education. I am going to share my screen and show you that list.

- I would like to find out how you rank the items on the list in order of importance.
- And, also, are there beneficial skills, knowledge, or competencies that are not included on the list?
- What is the sequence in which things should be learned?

Instructional Strategies

What are IPE topics that you think would most benefit dietetic students?

- How should the topics be prioritized?
- What is the best way to present the information so that each learner will master the objective?

Are there clear objectives regarding the IPE needs for nutrition and dietetic students?

- List some potential learning objectives of those IPE exercises?
- Should there be prerequisites for participating in IPE exercises?

There are lots of ways to provide students with interprofessional education experiences:

- What instructional strategies are most appropriate?
- What types of activities would you suggest?
- Are there instructional strategies that are NOT effective? If so, which ones and why?

Evaluation

How should the achievement of the objectives be measured?

- Should students take pre-tests? Should a grade be associated with IPE? What types of elements should be scored?
- How students demonstrate their understanding of the IPE learnings?
- Have you employed any of the standard tools (e.g., Role perception questionnaire, Readiness for IP Learning Scale, IPE Perception Scale, Attitudes to Health Professions Questionnaire)?
- How do you determine if a student will be able to translate IPE learnings into IPP?
- How assess what students liked and did not like about the IPE experience?
- What is the role of peer evaluation of learning in IPE?

Resource Considerations

What resources are needed for successful IPE?

- What organizational issues must be addressed for effective IPE experiences?
- What are the facilitators of IPE (e.g., accrediting body, merit of outcomes, relationships/strategies alliances, joint ventures, research, global trends, legal requirements)?
- What are the barriers (e.g.., existing curricula, faculty buy in, time, funding, hierarchies, silos, overlapping practice areas)?
- What individuals and groups have a stake in addressing these issues?

What are the steps in the process for planning, promoting, delivering, and evaluating IPE experiences?

- Who performs each step? How much time does it take to perform each step?
- How often should IPE experiences occur in the course of the 4-6 years of academic preparation to become an RDN?

Practitioners: Groups #5 & #6, RDNs Practicing in Clinical, Community, & Foodservice Management

As we discussed earlier, my goal tonight is to better understand the learning needs of nutrition and dietetic students regarding working on collaborative teams of health providers on the delivery of patient care.

Learner Analysis

Thinking about an interprofessional model, where there are different teams of health providers caring for a patient, what is the dietitian's role on the team?

- What other health professionals do dietitians typically collaborate with?
- Are other professionals who do not provide clinical care included on interprofessional teams?
- How prepared do you think the typical dietitian is to participate in interprofessional teamwork?
- What is the range of abilities among dietitians? Other providers?
- Based on your interactions with practicing dietitians, list the most important thing that dietetic students need to learn about interprofessional practice?

Are there challenges which students need to learn about regarding being members of interprofessional teams?

- Hierarchies, silos?
- Communication barriers?

Task Analysis

I emailed each of you a list of skills, knowledge, and competencies. This list was compiled from studies published on interprofessional education. I am going to share my screen and show you that list.

- I would like to find out how you rank the items on the list in order of importance.
- And, also, are there beneficial skills, knowledge, or competencies that are not included on the list?
- What is the sequence in which the information should be learned?

Instructional Strategies

Thinking about interprofessional educational exercises, what are some topics that you think would most benefit dietetic students?

- How should the topics be prioritized?
- How do you think the information should be presented to best help the students become effective team members when they are practicing?

Are there clear objectives regarding the IPE needs for nutrition and dietetic students?

- List some potential learning objectives of those IPE exercises?
- Should there be prerequisites for participating in IPE exercises?

There are lots of ways to provide students with interprofessional education experiences:

- What instructional strategies are most appropriate?
- What types of activities would you suggest?

Evaluation

How should the achievement of the objectives be measured?

- How students demonstrate their understanding of the IPE learnings?
- How should we determine if the students care translate IPE learnings into practice?
- What is the role of peer evaluation of learning in IPE?

Resource Considerations

How often should IPE experiences occur in the course of the 4-6 years of academic preparation required to become an RDN?

Administrators, Health Care Sector: Group #7

As we discussed earlier, my goal tonight is to better understand the learning needs of nutrition and dietetic students regarding working on collaborative teams of health providers on the delivery of patient care.

Learner Analysis

Thinking about an interprofessional model, where there are different teams of health providers caring for a patient, what is the dietitian's role on the team?

- What other health professionals do dietitians typically collaborate with?
- How prepared do you think the typical dietitian is to participate in interprofessional teamwork?
- Are new-to-the-workforce dietitians prepared for interprofessional practice?
- Based on your interactions with practicing dietitians, list the most important thing that dietetic students need to learn about interprofessional practice?

Are there challenges which students need to learn about regarding being members of interprofessional teams?

- Hierarchies, silos?
- Communication barriers?

Task Analysis

I emailed each of you a list of skills, knowledge, and competencies. This list was compiled from studies published on interprofessional education. I am going to share my screen and show you that list.

- I would like to find out how you rank the items on the list in order of importance.
- And, also, are there beneficial skills, knowledge, or competencies that are not included on the list?
- What is the sequence in which tasks should be learned?

Instructional Strategies

Thinking about interprofessional educational exercises, what are some topics that you think would benefit dietetic students?

- How should the topics be prioritized?
- How do you think the information should be presented to best help students become effective team members when they are practicing?

Are there clear objectives regarding the IPE needs for nutrition and dietetic students?

- List some potential learning objectives of those IPE exercises?
- Should there be prerequisites for participating in IPE exercises?

There are lots of ways to provide students with interprofessional education experiences:

- What instructional strategies are most appropriate?
- What types of activities would you suggest?

Evaluation

What is the impact of IPE on interprofessional practice?

- Give examples of how interprofessional practice affects patient care, health outcomes, and patient satisfaction?
- In your experience, does interprofessional practice enhance patient-centered care?
- Does it enhance patient safety?
- Has interprofessional practice helped address gaps during workforce shortages?

How should the achievement of the objectives be measured?

- How students demonstrate their understanding of the IPE learnings?
- How should we determine if the students can translate IPE learnings into practice?

How would you describe the level of provider satisfaction with regards to interprofessional practice?

Resource Considerations

How often should IPE experiences occur in the course of the 4-6 years of academic preparation required to become an RDN?

Patients, Family Members, & Caregivers Group #8

As we discussed earlier, my goal tonight is to better understand the learning needs of health professions students with regards to preparing them to be effective team members who provide health care for patients.

Learner Analysis

First, I would like to learn more about your experience with teams of different health care professionals providing you or your loved one care.

Think about a time when you worked with two or more health care providers about a health problem that you or a loved one was receiving treatment:

- As a patient, did the team talk to you about your role as a member of that health care team?
- Did you feel that you learned enough about your health condition to engage with the various health professionals?
- Did the team engage you in the clinical care decision making process?
- Did they appear to work well together?
- Was one of them a dietitian?

Task Analysis

Let's talk a little bit about registered dietitians:

- Have any of you worked with a dietitian?
- What did you like about working with the dietitian?
- What did you dislike?
- Were they active members of the interprofessional team?
- What types of things did they do? Were you surprised by the tasks they were responsible for? Were there things you expected dietitians to do that another health care provider did?

Instructional Strategies

If you were in charge of educating students on how to work as part of a clinical care team:

- What types of things would you teach them?
- How would you teach them those things?

Appendix 2: Learning Needs Assessment Final Report

Interprofessional Education (IPE) Learning Needs of Nutrition & Dietetic Students

Goals & Process

- Investigate the interprofessional (IP) learning needs of nutrition and dietetic students
- Evaluate how the 2024 master-prepared requirement might impact the interprofessional learning needs of these students
- Develop actionable list of recommendations

1 PARSE-IPE Conceptual Framework

- Weds theoretical concepts of three domains—action research, instructional design, IPE
- Combines participatory action research spiral, systems model of instructional design, and IPE color wheel
- Employed a modified grounded theory approach merged postulatory constructs and theoretical components of each domain

2 Document Analysis

- Accreditation Council for Education in Nutrition and Dietetics (ACEND) IPE requirements
- Literature: Learner characteristics and IPE knowledge, skills, competencies

3 Stakeholder Focus Groups

	Students		Faculty		RDNS		ADMIN	Family Member	Total
	NUTR	Other	NUTR	Other	C & C	FSM			
Participants	10	5	6	5	3	6	5	1	41
Perspectives	11	8	12	5	11	13	9	1	70

4 Bias Checks

- Expert review of moderator's guide
- Perspective triangulation of focus group findings
- Member check of focus group summaries

5 Logic Model

- Maps inputs and outputs required for desired impact
- Stratifies impact into short, medium and long-term effects

IPE Learning Needs 1

SNAPSHOT OF LEARNING NEEDS

Learner Analysis	**Demographics**	• Primarily Caucasian, female, 18-35 years of age • Fluent in English
	Social Traits	• Desire to help others; "passion" for nutrition • Technology savvy
	Entry Requirements	• Moderately competitive, minimum GPA for admittance • Participate in national match for dietetic internship
	Academic Information	• Enjoy IPE programs, prefer case studies and realistic scenarios • Lack self-efficacy, need safe place to practice
Task Analysis	**IPP Teammates**	• Vary with practice setting and patient health status • Clinical and nonclinical professionals; patients and supporters
	Skills, Knowledge, Competencies	• Ethics/values, roles/responsibilities, communication, teamwork • Spectrum of learning, demonstrating, and doing consistently
Instructional Strategies	**Learning Objectives**	• Consider academic status/setting; utilize ACEND requirements • Employ Bloom's Taxonomy; map to assessments
	Potential Topics	• Two types: General workplace and health-related • Clinical, community, and foodservice management scenarios
	Timing / Prerequisites	• Frequently, not one and done situation • Weigh pros and cons of including IPE in lower-division courses
	Modes of Instruction	• Role playing, case studies, simulations • Real-life, complex scenarios; involve RDN with IPP experience
Evaluation	**Accreditation Requirements**	• How well applied management principles • Use of communication, collaboration, advocacy, teamwork
	Modes of Evaluation	• Self-assessment/reflection (pre-post), peer review (anonymous) • Employ Kirkpatrick's IPE Evaluation Typology
Resource Considerations	**Funding**	• Lack of a long-term, dedicated funding stream is key barrier • One school has established a student IPE fee
	Human Resources	• The level of effort (labor hours) required to develop, plan, execute, and evaluate IPE activities is not recognized
	Organizational norms	• Academic silos inhibit IPE opportunities • Model IPP by embracing cross-silo opportunities

LEARNER ANALYSIS

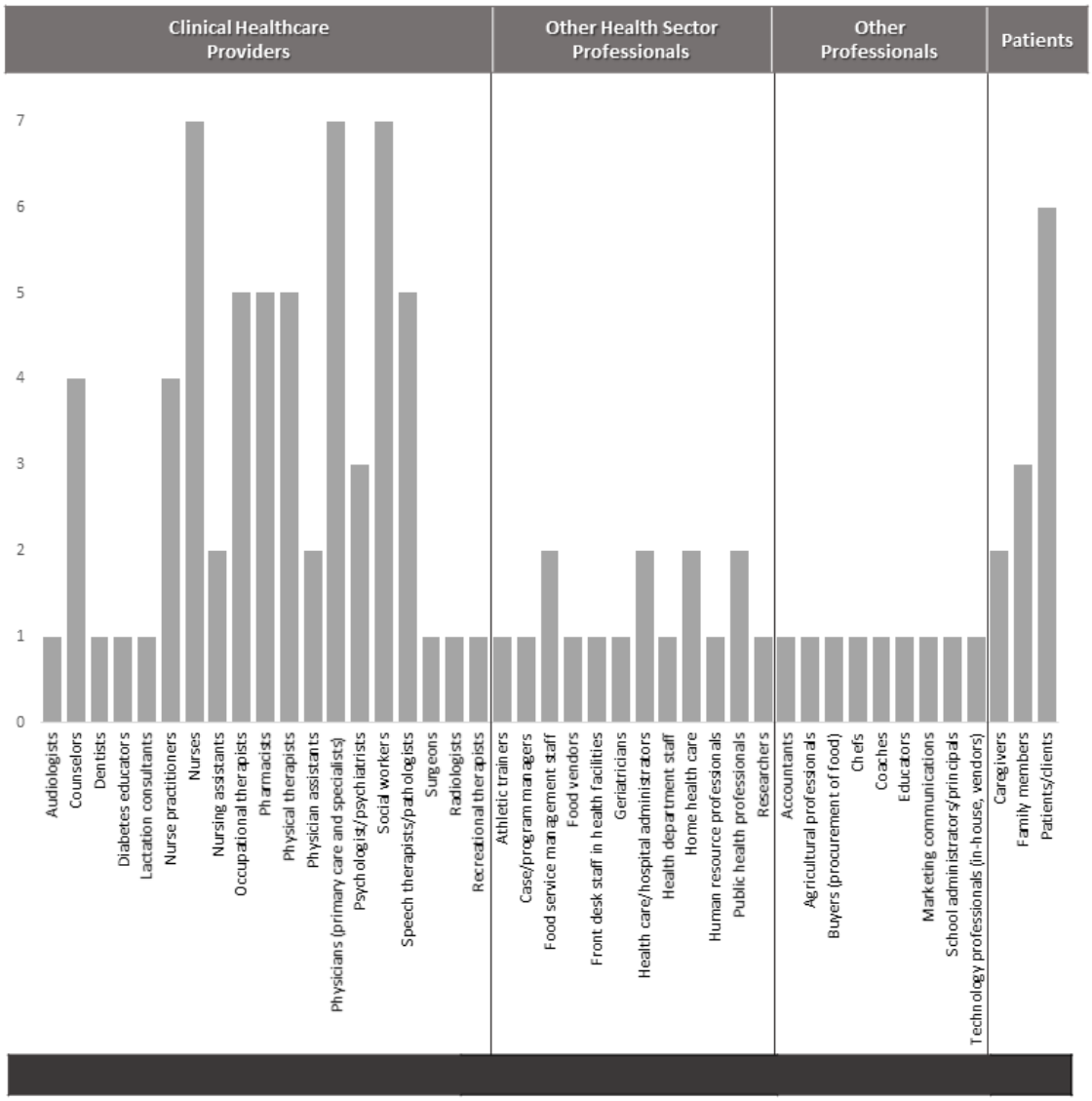
Characteristics of Nutrition and Dietetics Majors*	
Demographics	• Mostly Caucasian females, reflection of demographic of practicing RDNs • 18-35 years of age • Fluent in English language
Social Traits	• Reasons for selecting major: Help others and "passion" for nutrition • 100% use technology for various tasks • Majority are living on tight budgets; thus, financial security is a looming cloud • Predominately highly motivated learners, though there are exceptions • Need safe place for role play and practicing new skills
Entry Requirements	• High school graduates with at least a B grade point average (undergraduate students) • Admitted to Didactic Program in Dietetics (DPD) or Coordinated Program (CP) • Participate in national match for Dietetic Internship (DI) and MS/DI programs • College graduates with a degree in nutrition or related field (graduate students)
Academic Information	• Upper-division students with at least a cumulative B average in prerequisites • Fulfilled general education requirements and prerequisites • A small number of students have accommodations due to disabilities (typically, additional time for taking quizzes and tests) • Biochemistry grade is indicative of successful graduate performance (odds of optimal performance decreased by a factor of 0.2 times for each grade point decrease in biochemistry grade) • Students' perceptions on scope of knowledge priorities: nutrition knowledge, autonomy, communication, interpersonal skills, empathy, teamwork, organizational skills, and education and counseling skills • Limited understanding of scopes of practice of potential IPP team members • Educational program includes introduction to different practice settings; specifically, clinical, community, and food service management • Lack confidence in competency to apply scope of knowledge and practice
Learning Styles & Preferences	• Range of learning styles: – Accommodator—prefer hands-on experiences, rely on intuition rather than logic – Diverger—learn through observation, brainstorming, and information collection – Assimilator—organize information into logical categories and develop theories – Converger—pragmatic; employ deductive reasoning to solve problems • Prefer learning by doing, enjoy small group activities (IPE case studies, simulations, role-playing) • Favor flexible coursework that fosters independence

*The categories of learning characteristics overlap, for the purpose of this chart, data were only recorded once

SOURCES: Clark et al. (2017); Hughes & Desbrow (2005); Mitchell et al. (2005); Schrader et al. (2004); and researcher expertise followed by nutrition and dietetics faculty member check

TASK ANALYSIS

Potential Interprofessional Practice Team Members



Knowledge, Skills, & Competencies

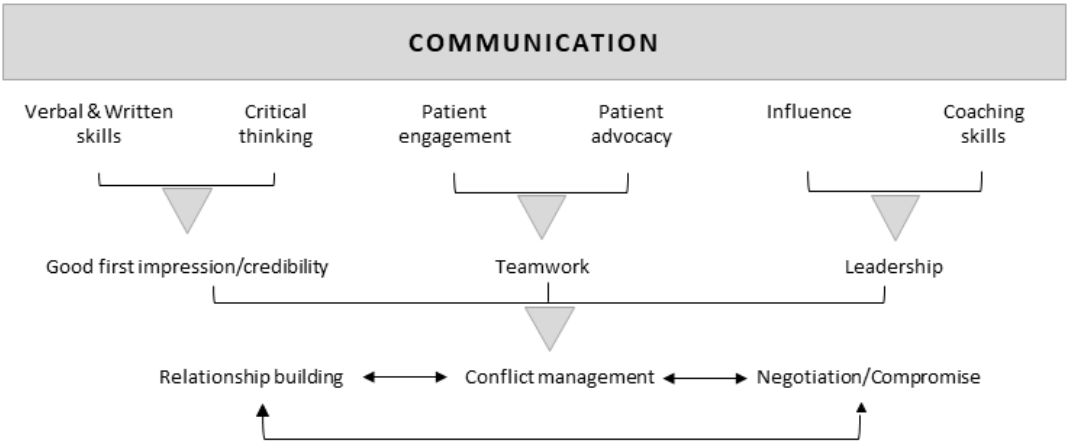
Spectrum

- Some items fall into all three categories: knowledge, skills, and competencies.
- The concept of a spectrum of acquiring knowledge, building skills, and consistently perform competencies precipitated.

BUILD → Knowledge	DEMONSTRATE → Skills	CONSISTENTLY PERFORM Competencies
Principles of nutrition research	Conduct research; interpret and explain findings verbally and in writing	Translate research for patients and IPP team members
Principles of advocacy (how to advocate for self and others)	Publicly support or recommend a particular position	Advocate for patients Communicate RDN role on IPP team
Medical nutrition therapy, nutrition care process	Counseling and educating patients, caregivers, family members	Execution of the nutrition care process

Umbrella Constructs

- Overarching constructs that include multiple knowledge, skill, and competency elements
- Examples offered by focus group participants were communication, professionalism, ethics, patient-centered care, professionalism, among others.



IPE Learning Needs

5

	Knowledge	Skills	Competencies
Values and Ethics	• Diversity and implicit bias • Ethics • Values	• Compassion • Humility • Relationship-/trust-building • Self-reflection (bias awareness)	• Compassion (perform) • Comfort with change • Ethics and values (perform) • Listening with care • Taking others seriously
Roles and Responsibilities	**SCIENCE OF DIETETICS** • Scope of knowledge • Translational research	• Critical thinking	• Evidence-based practice • Interpret research for patients and IPP team members • Commitment to CPE
	BUSINESS OF DIETETICS • Community health • Cost of care • Leadership • Work of IPP teams	• Emergency management • Leadership/followership • Project management • Problem-solving • Technology	• Collaboratively solve problems • Lead or serve as member of project team • Lead or participate in managing emergencies
	PRACTICE OF DIETETICS • Scope of practice • Patient-centered care • Roles of other team members	• Teamwork	• Autonomy/self-esteem/ interdependence • Confidence in knowledge • Patient-centered care (demonstrate) • Shared decision-making • Teamwork (demonstrate)
Communication	• Advocacy • Counseling theories • Health literacy • Pedagogue	• Active listening • Advocacy • Coaching • Conflict management • Counseling/group dynamics • Negotiation • Patient engagement • Pedagogue • Writing skills	• Coaching • Comfort being challenged and seeking feedback • Patient advocacy • RDN role education/advocacy
Teams and Teamwork	• Team dynamics • Leadership • Followership	• Active listening • Conflict management • Counseling/group dynamics • Negotiation • Patient engagement	• Shared decision-making • Coaching • Comfort being challenged and seeking feedback • Patient advocacy
	PROFESSIONALISM • Ethics • Diversity and implicit bias • Emotional intelligence	• Adaptability/flexibility • Good first impression (credibility) • Time management • Punctuality • Reliability • Respect for others and other's time • Consistent performance • Being responsible	• Curiosity • Identify/respect unique cultures and experiences • Relationship/trust building • Self-reflection (bias awareness, continuous improvement)

INSTRUCTIONAL ANALYSIS & EVALUATION

Learning Objectives	Instructional Modalities	Learning Assessments
Craft Based on Type of Activity		
Knowledge	Didactic lessons, group work	Tests, graded assignments
Skills	Role plays, hands-on trainings	Demonstrate (rubric)
Competency	Case studies, simulations	Self review (pre-post), peer review
Consider Students' Current Level in the Program		
Lower division	Communication, teamwork	Peer reviews (autonomous)
Upper division	*MNT, NCP, coding/reimbursement	Tests, graded assignments
Supervised practice	Experiential learning	Perform consistently, IP evaluation
Include ACEND Performance Indicators		
Knowledge (KRDN) • Describe IPP in practice settings • Describe role of RDN on IPP team	• Seminars with potential IP team members (practitioners/students) • Guest speakers	• Tests • Graded assignments • Case study questions
Competency (CRDN) • Function as member of IPP team • Apply principles of management • Use effective communication, collaboration, and advocacy skills • Respect roles and responsibilities of IPP team members	• Didactic lessons • Seminars, guest speakers • Shadowing (RDNs and potential IPP team members) • Role plays • Simulations • Case studies • Supervised practice	• Demonstrate (rubric) • Self review (pre-post) • Peer review • Do consistently • 360 evaluations by IPP team members

* MNT = medical nutrition therapy, NCP = nutrition care process; IP = interprofessional

INSTRUCTIONAL ANALYSIS & EVALUATION

Learning Objectives: "It's all about the verbs"

Bloom's Taxonomy	Knowledge		Skills & Competencies			
	KNOWLEDGE	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
	Define Identify Describe Recognize Tell Explain Recite Memorize Illustrate Quote	Summarize Interpret Classify Contrast Infer Restate Extract Paraphrase Cite	Solve Change Relate Complete Use Sketch Teach Articulate Discover Transfer	Contrast Connect Relate Devise Correlate Illustrate Distill Conclude Categorize Take Apart	Criticize Reframe Judge Defend Appraise Value Prioritize Plan Grade Reframe	Design Modify Role-Play Develop Rewrite Pivot Modify Collaborate Invent Write

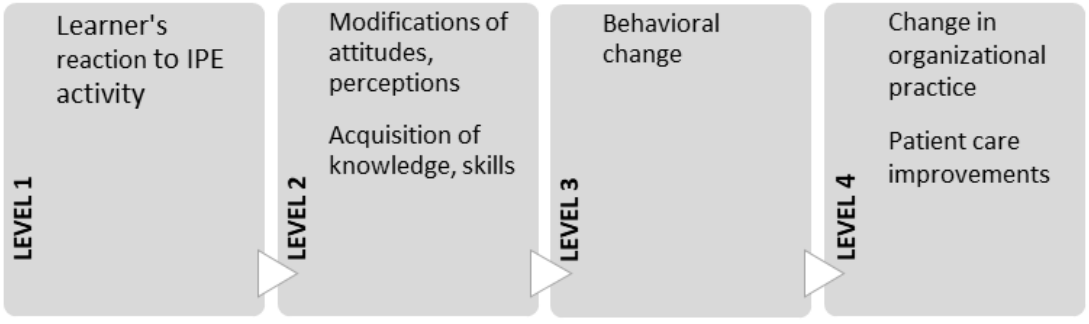
Instructional Modalities: Student Preferences

A **seminar style class** would be really interesting with students from other health professions."

"I like the **case study** idea and being able to work… with other professionals or students in different degrees… because then we're able to share ideas and… hear different ideas."

"I think **role plays** are always good… [role plays] are uncomfortable, that can be good [for students]."

Learning Assessments: Kirkpatrick's IPE Evaluation Typology



Potential Topics & Timing

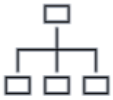
	General Workplace Topics	Timing		
		Lower Division	Upper Division	Supervised Practice
Introduction to Interprofessional Practice	Interprofessional practice models		X	X
	SOP/roles of IPP team members		X	X
	Teachings others about your profession		X	X
	Influence of nutrition on health		X	X
	Influence of nutrition on outcomes		X	X
	Patient-centered care		X	X
	Behavioral change (uniform message)	X	X	X
	Rounds		X	X
	Resolving team conflict/SOP creep		X	X
	Shared visits		X	X
	Discharge planning teams		X	X
IPP in Different Practice Settings	Inpatient and outpatient scenarios		X	X
	Community/public health nutrition		X	X
	Foodservice management		X	X
	Interdependence of clinical and FSM		X	X
	Niche areas of dietetics practice	X		X
	Public policy	X		X
	Partners outside of the healthcare	X	X	X
	Long-term care/residential scenarios		X	X
	End-of-life/ no chance of recovery		X	X
Skill/Competency Building	Business of nutrition (coding, reimbursement)		X	X
	Budgeting and resource management	X		X
	Emergency management	X		X
	Communication skills	X		X
	Conflict management	X		X
	Negotiation	X		X
	Ethics/values	X		X
	Leadership	X		X
	Personnel coaching	X		X
	Current topics (media-generated)	X	X	X

Potential Topics & Timing

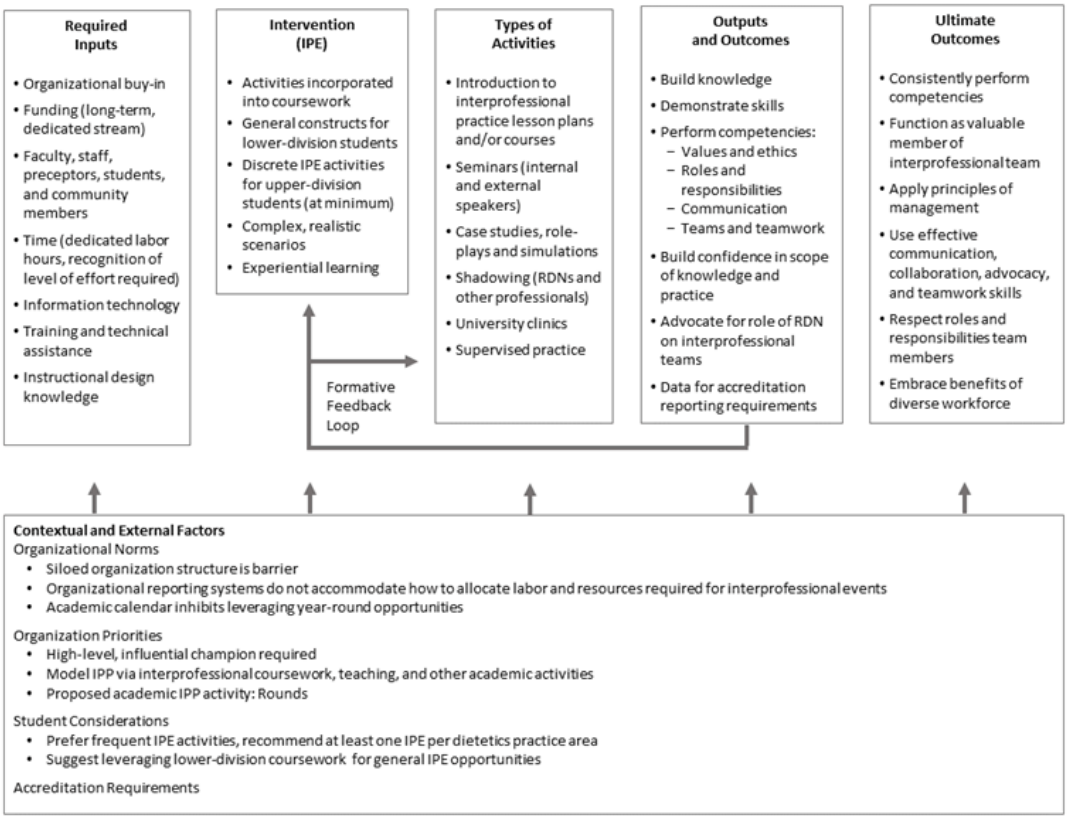
	Health Specific Topics	Timing		
		Lower Division	Upper Division	Supervised Practice
Behav. Health	Eating disorders (disordered eating)		X	X
	Substance abuse		X	X
CVD, Met. Syn., DM, & Wt. Mgt.,	Diabetes		X	X
	Heart disease, hypertension, and stroke		X	X
	Hypercholesterolemia		X	X
	Metabolic Syndrome		X	X
	Overweight/obesity		X	X
Dev. Dis. & Neurological	Developmental disabilities		X	X
	Intellectual disabilities		X	X
	Neurocognitive disorders		X	X
	Parkinson's disease		X	X
NS	Refeeding syndrome		X	X
Onc. & Trans.	Head and neck cancer		X	X
	Transplant teams		X	X
SDOH	Elder abuse	X		X
	Food insecurity	X		X
	Sociodemographic factors	X		X
Specific Populations	Maternal and infant health		X	X
	Families and those group dynamics	X		X
	Geriatrics		X	X
	Sports nutrition		X	X
	Individuals with comorbid conditions		X	X
	Tailoring solutions to patient needs		X	X
Hot Topics	Anti-inflammatory diets		X	X
	Controversial topics (probiotics)	X	X	X
	Current topics (media-generated)	X	X	X

Behav. Health = behavioral health; CVD = cardiovascular disease, Dev. Dis. = developmental disorders; DM = diabetes mellitus, Met. Synd. = metabolic syndrome; NS = nutrition support; Onc. & Trans. = oncology and transplantation; SDOH = social determinants of health; Wt. Mgt. = weight management;

RESOURCE CONSIDERATIONS

	**Funding Streams** • Lack of long-term dedicated funding • Common funding source is grant dollars, sustainability is problem • Proposed economic model: IPE student fees
	**Human Resource Considerations** • Labor-intensive to design, plan, execute, and evaluate • Lack of recognition about the faculty time required for planning and hosting • Not factored into faculty workload calculations • Need for RDN with IPP experience, if faculty lack • Time required to collaboratively develop IPP materials
eat right® **Academy of Nutrition and Dietetics**	**Accreditation Requirements** • ACEND – Knowledge: ▪ Describe interprofessional relationships in various practice settings ▪ Explain work of interprofessional teams and the RDN role on the teams – Competency ▪ Function as member of IPP team ▪ Apply principles of organizational management ▪ Use effective communication, collaboration, and advocacy skills • Each profession requires preceptor from their profession—limits ability to optimize student "real-world" interprofessional experiences
	**Organizational Norms** • Siloed organization structure is barrier • Organizational reporting systems do not accommodate how to allocate labor and resources required for interprofessional events • Academic calendar inhibits leveraging year-round opportunities
	**Student Considerations** • Prefer frequent IPE activities • Recommend at least one IPE per dietetics practice area • Suggest leveraging lower-division coursework for general IPE opportunities
	**Organization Priorities** • High-level, influential champion required • Model IPP via interprofessional coursework, teaching, and other academic activities • Proposed academic IPP activity: Rounds

LOGIC MODEL


Required Inputs
• Organizational buy-in
• Funding (long-term, dedicated stream)
• Faculty, staff, preceptors, students, and community members
• Time (dedicated labor hours, recognition of level of effort required)
• Information technology
• Training and technical assistance
• Instructional design knowledge
Intervention (IPE)
• Activities incorporated into coursework
• General constructs for lower-division students
• Discrete IPE activities for upper-division students (at minimum)
• Complex, realistic scenarios
• Experiential learning
Types of Activities
• Introduction to interprofessional practice lesson plans and/or courses
• Seminars (internal and external speakers)
• Case studies, role-plays and simulations
• Shadowing (RDNs and other professionals)
• University clinics
• Supervised practice
Outputs and Outcomes
• Build knowledge
• Demonstrate skills
• Perform competencies:
– Values and ethics
– Roles and responsibilities
– Communication
– Teams and teamwork
• Build confidence in scope of knowledge and practice
• Advocate for role of RDN on interprofessional teams
• Data for accreditation reporting requirements
Ultimate Outcomes
• Consistently perform competencies
• Function as valuable member of interprofessional team
• Apply principles of management
• Use effective communication, collaboration, advocacy, and teamwork skills
• Respect roles and responsibilities team members
• Embrace benefits of diverse workforce
Formative Feedback Loop
Contextual and External Factors
Organizational Norms
• Siloed organization structure is barrier
• Organizational reporting systems do not accommodate how to allocate labor and resources required for interprofessional events
• Academic calendar inhibits leveraging year-round opportunities
Organization Priorities
• High-level, influential champion required
• Model IPP via interprofessional coursework, teaching, and other academic activities
• Proposed academic IPP activity: Rounds
Student Considerations
• Prefer frequent IPE activities, recommend at least one IPE per dietetics practice area
• Suggest leveraging lower-division coursework for general IPE opportunities
Accreditation Requirements

TEN RECOMMENDATIONS

1. Offer IPE frequently. Given the homogeneity of the profession, IPE activities offer an opportunity for nutrition and dietetic students to experience the benefits of diversity in the workplace. Consider scheduling a regular monthly activity.
2. Leverage lower-division coursework to hone skills.
3. Engage RDNs with IPP experience in the development, execution, and evaluation of IPE experiences.
4. Make IPE scenarios real, include patients with comorbid conditions and complicating social dynamics, and recognize that multiple solutions may be correct.
5. Integrate opportunities to build confidence in the scope of knowledge, business, and practice, negotiation skills, and comfort with change/being challenged.
6. Incorporate IPE into each main area of dietetics education (clinical, community, food service management.
7. Offer an IPE activity that demonstrates the collaboration required between the clinical and foodservice teams of RDNs.
8. Employ existing tools for developing objectives and assessments (Bloom's Taxonomy, Kirkpatrick's IPE Evaluation Typology).
9. Lobby ACEND to mandate course release for faculty members significantly engaged in IPE development, planning, implementation, and evaluation.
10. Recruit an influential, upper-level IPE champion who can help organizational leaders commit to breaking down silos and secure a long-term funding stream.