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## Virtual supervised practice during the COVID-19 pandemic. Does virtual learning affect the quality of preparation for the RD exam or beginning Dietetics practice?

Shaynee M. Roper  
shayneerd@gmail.com

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Virtual supervised practice during the COVID-19 pandemic. Does virtual learning affect the quality of preparation for the RD exam or beginning Dietetics practice?

by

Shaynee Roper, DCN, MEd, RD, LDN, FAND

DISSERTATION COMMITTEE


Lauri Wright, PhD, RDN, FADA  
Chair, Department of Nutrition and Dietetics  
Director of the Center for Nutrition & Food Security  
University of North Florida

Susan Edgar Helm, PhD, RDN, FAND  
Professor of Nutritional Science  
Chairperson, IRB  
DPD-Director, Academy of Nutrition and Dietetics  
Seaver College, Pepperdine University

Claudia Sealey-Potts, PhD, RD, LDN, FAND  
Associate Professor & MS/DI and ISPP Director  
University of North Florida

## DISSERTATION CERTIFICATE OF APPROVAL

The dissertation of **Shaynee Roper** is approved:

  
\_\_\_\_\_  
Dr. Lauri Wright, Committee Chair

4/14/2022  
\_\_\_\_\_  
Date

Dr. Claudia Sealey-Potts

04/26/2022  
\_\_\_\_\_  
Date

Dr. Susan Helm  
\_\_\_\_\_

4/26/2022  
\_\_\_\_\_  
Date

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## Abstract:

The Covid-19 pandemic has seemingly altered the practice of Dietetics, and its essential supervised practice component of the Dietetic Internship programs. Telehealth, in particular telenutrition, became a necessity of practice for the entire United States and many parts of the world. Medicare and many private insurance companies amended policies for the expansion, inclusion, and provision of MNT via telephone.<sup>1</sup> In addition, numerous Dietetic Interns were forced to complete the supervised practice (SPE) components of ACEND (Accreditation Council for Education in Nutrition and Dietetics) accredited programs virtually. The practice of telehealth is not a new concept. Indeed, this area of Dietetics practice was growing prior to the pandemic. However, virtual completion of the supervised practice component of Dietetic Internships was previously not an accepted practice and was temporarily approved by ACEND. The approval of this virtual supervised practice will continue (until at least June 30, 2022) as it is based on a decision by the United States Department of Education (USDE) and remains active until the USDE rescinds this accommodation of virtual learning. The purpose of this study is to gain the perspective of dietetic interns and employers of the quality of this virtual supervised practice experience during the COVID-19 pandemic, and to compare RD exam pass rates between the graduated classes of 2019 (no virtual SPE) and 2020 (some SPE). The mixed methods approach to this study will utilize both quantitative (surveys) and qualitative (interviews) methods.

## Introduction:

ACEND accredited programs are required to provide a minimum of 1,200 supervised practice hours to Dietetic Interns.<sup>2</sup> Three hundred of these hours may be provided through alternate practice experiences such as simulations, role playing activities, case studies, etc.<sup>2</sup> Because of COVID-19, these requirements were temporarily allowed by the USDE with direction by ACEND to be modified (January 1, 2020 – June 30, 2022) to a minimum of 1,000 hours of supervised practice with the allowance of 600 of these hours coming from alternate practice experiences.<sup>2</sup> These changes were made while taking the following factors into consideration<sup>2</sup>: the crucial need for Dietitians as essential healthcare personnel during the pandemic, students losing the authorization to complete rotations at numerous practice sites, and the likelihood of COVID-19's impact on education well beyond 2021 and possibly resulting in the loss of practice sites. ACEND requires that the 600 hours of real-life professional experiences for Interns continue yet allows for these experiences to take place virtually – clients and/or patients must be real and/or entail real-life situations. The standards set forth by ACEND have not changed and programs must ensure that all interns meet each competency prior to graduation from his/her program of study. Key concepts in the field of Dietetics with respect to Dietetic Interns and Internship programs focus on meeting the competencies set forth by ACEND and the ability to successfully sit for CDR's registration exam.

The rapid conversion from onsite supervised practice to remote learning brought forth numerous challenges to Preceptors, Interns, and Program Directors (PD). In April, ACEND provided much guidance to Program Directors regarding the provision of this alternate practice experience. This included ethical considerations, HIPAA compliance, and suggestions for remote learning experiences and tracking documents for virtual hours of SPE.<sup>3</sup> In addition,



ACEND determined that it was not necessary for all students to complete the same activity to meet a specific competency.

While small parts of both Perraton's Distance Education theory and Wedemeyer's Theory of Independent study will be used in this research; the primary theory to be used is Simonson's Equivalency theory. The Equivalency theory states that students utilizing distance education need not perform the same learning activities, but these activities must be equivalent to those performing learning activities in the standard manner (face to face). Standard 6.3c of the ACEND standards for Dietetics programs states that programs must ensure comparability of experience when different learning methods are used.<sup>3</sup> While onsite supervised practice experience and virtual supervised practice experience are not equal; these can be equivalent. This equivalent experience, in turn, can lead to the equivalent quality of preparation for graduated interns in taking the RD examination and beginning practice in the field of Dietetics.

The primary purpose of this study is to determine if a difference exists in the quality of preparation in virtual supervised practice experience with regards to the RD examination and beginning Dietetics practice. The mixed methods cross sectional study combines both quantitative (surveys) and qualitative (interviews) research. The rationale for utilizing a mixed methods approach is to link the perceptions of the dietetic interns and employers regarding the quality of the virtual supervised practice component of Dietetics education to the RD examination pass rates and ability to function as an entry level Dietitian. Inferences may be extrapolated to the entire population from this cross-sectional sample of Interns, employers, and Program Directors. Surveys will be initially sent to Program Directors to obtain RD exam pass rates for the Program and to ask questions regarding the use of virtual supervised practice experience. Surveys will then be sent to graduated Interns from the classes of 2019 and 2020.

These surveys will ask questions regarding the Interns' perception of the virtual supervised practice experience and individual RD exam pass rate. Graduated Interns will be asked if he/she would be willing to send a survey to the first employer following graduation. Both Interns and employers will be asked about his/her willingness to participate in an interview regarding the perception of the quality of virtual supervised practice experience.

The use of various virtual learning techniques such as case studies, webinars, and simulations are somewhat common in several medical professions, yet the COVID-19 pandemic forced all training for most healthcare professions to be accomplished virtually without the benefit of onsite interactions. In contrast though, prior to COVID-19, the Dietetics profession did not often heavily rely on these virtual learning experiences for the completion of ACEND accredited programs. Indeed, for several years prior to the pandemic, one of our practice groups, Nutrition and Dietetic Educators and Preceptors (NDEP) often called for best practices for simulations and other methods of virtual learning with a poor response. Within a month of moving to a virtual environment, the generosity from private educational companies and individual educators was tremendous, resulting in a collaborative list of valuable alternative virtual learning practices.

The COVID-19 pandemic forced multiple stakeholders to reevaluate the methods of providing education and supervised practice experience to many students and Interns from various healthcare professions, including the Dietetics profession.

## Chapter 1: Review of Literature

### Simulation-based learning:

As previously stated, during the COVID-19 pandemic, most healthcare students and interns were physically distant from training facilities, classrooms, and supervised practice sites. All students and interns are required to achieve minimum competency and skill levels as part of his/her training. The use of simulation became more widespread and emerged as a promising strategy to provide this training worldwide.<sup>5</sup>

A 2019 systematic review of literature by O'Shea et al<sup>6</sup> identified 14 research studies in which simulation-based learning was used in dietetics programs. This review included all simulation-based learning experiences including mannequins, computer simulation, and videos. While multiple reporting methods were present, the overall perception of dietetics students/interns completing this type of learning for the purpose of developing counseling skills was positive. In another 2019 study by O'Shea et al<sup>7</sup>, 10 nutrition and dietetics and 13 exercise physiology students participated in a simulation module. During this module, students observed then collaborated in the development of a multi-disciplinary treatment plan for patients with diabetes. Students either presented information to patients face to face or via telephone. The overall perception of students participating in this study was 4.5 on a 5-point scale. In addition, both disciplines perceived post-simulation competence significantly higher than pre-simulation (pre 3.72; post 4.86 on a 7-point scale).<sup>7</sup> A 2020 study by Nowosielecki et al<sup>8</sup> utilized a healthcare theatre simulation program to assist nutrition students in the development of counseling skills. Theatre students acted as patients while nutrition students conducted a nutrition assessment and provided counseling in a mock hospital room with a two-way mirror. Of the 404 students participating in this program, 121 responded to a follow up survey. Eighty-two percent

(82%) of respondents reported feeling more confident in rapport building skills, and all reported an improvement in interviewing skills after completion of the program. A 2020 report by Tabatabai<sup>9</sup> provides a commentary on the challenges of quickly incorporating simulations and virtual learning into clinical education in Iran. This report discusses the benefits of simulation-based learning and future uses for this type of education. Numerous benefits, including rapport building skills, and ability to synthesize all components into a care plan, are seen to this type of learning for the clinical education of medical professionals. A 2018 study by Lowell and Alshammari<sup>10</sup> compared three different learning methods: literature review, video, and a 3D role playing simulation. Sixteen students completed the entire study. Responses to a follow up survey rated the 3D learning environment the highest with a score of 45.25 out of 54. The overall results of the study show that coupling online learning with human simulation increases student performance. Students also perceived the ability to transfer the skills learned in this environment to situations outside of the classroom. As can be seen from this research, simulation-based learning is perceived as beneficial to students and appears to assist in the building of counseling and rapport building skills.

#### Video and Online Learning:

A 2020 study by Jones and Rathman<sup>11</sup> sought to determine the benefits of instructional videos with 30 students enrolled in a food preparation class. Half of the students watched instructional videos prior to conducting lab experiments while the other half of the students watched these same videos after conducting the lab experiments. Results of the study showed significantly higher scores on pre-lab quizzes and reports, and overall final class grades in the group who viewed these videos prior to conducting experiments. A 2017 randomized control trial by

Abdulsalam et al<sup>12</sup> compared the effectiveness of traditional lecture using power point slides (G1), face to face demonstration (G2), online lecture (G3), and a combination of online lecture and face to face demonstrations (G4) to enhance the skills of culinary students. Knowledge scores for Groups 2, 3, and 4 increased significantly as compared to Group 1, with Group 4's scores increased the most. It was determined that a combination of online learning and face to face demonstrations benefitted students more than any other type of learning studied. A 2020 study by Won et al<sup>13</sup> sought to determine students' perception of remote learning. Preliminary results of this small study indicate that students felt most "heard" on Zoom or Rumii. Some students preferred using the chat feature on the digital platform instead of using the actual audio discussion. Numerous students reported the biggest obstacle to remote learning was technical issues encountered. A 2020 report by Gomez et al<sup>14</sup> discusses the rapid transformation to remote learning for medical students in a radiology elective class. Enrollment in the elective class increased from an average of 10 students to 116 students in one quarter which indicated the desire for virtual learning by these students. Final interviews and survey results are not yet available but preliminary student feedback is very positive. Most students stated that the case sessions and interactive online workshops were his/her favorite part of the class. Class faculty reported increased student participation as well. A 2019 research study by Heuberger and Clark<sup>15</sup> sent surveys to former and current clinical nutrition students, and sought to understand the perceived differences of synchronous, asynchronous, or hybrid courses. Survey results from the 176 respondents showed that student perception of course delivery method varied based on the learning style of the student. There were both positive and negative attributes of all types of learning. Students suggested improvements to these courses including: virtual labs, simulation-based learning, and course recordings. A 2015 review of virtual internships for engineering

students by Medeiros et al<sup>16</sup> showed numerous advantages with only a few disadvantages. Advantages included: mobility, flexibility, access to online university resources, and ability to build a global professional network. From this research, it appears that videos and online/virtual learning techniques are beneficial. It is interesting to note that clinical nutrition students suggested simulation-based learning as an improvement to online learning. Simulation-based learning appears to be perceived by students as the most beneficial type of virtual/remote learning students. A 2018 study by Souza et al<sup>17</sup> compared face to face and distance education for healthcare professionals. Twenty-seven participants (healthcare professionals trained in either nursing, medicine, or dentistry) successfully completed an 18-month Family Health course: 12 in the distance education group, and 15 in the face-to-face group. The study attempted to compare academic performance, self-regulation of learning, procrastination, and the perception of self-efficacy between the modalities of distance (online) education versus face-to-face learning. Results of this study<sup>17</sup> showed no statistical significance between the two groups except for the procrastination of studying for exams in the middle of the study, total procrastination, and the perception of self-efficacy in social interactions. The students' regulation of self-learning and academic performance showed no significant differences. While this study is small, the results are similar to others reviewed.

While the above research presents benefits and limitations of video and online learning for students and interns, can the same benefits be seen for patients? A small 2020 study by Lindsay-Adler et al<sup>18</sup> sought to assess the benefits of video nutrition counseling for managing obesity in children with asthma. Twenty-one subjects ages 7-18 years were enrolled in the study; 14 of these participants completed all visits and procedures. The study allowed for 3 visits with a pulmonologist and 4 video visits with a dietitian over a 6-month period. Motivational

interviewing techniques were utilized by the dietitian to guide discussions using either Skype, WhatsApp, and/or FaceTime.<sup>18</sup> At each visit, participants were evaluated for quality of life measures for asthma using the PAQOL tool, and obesity using the Sizing Me Up (SMU) tool. Twelve of the 14 who completed the study reported improvement in obesity quality of life scores. Median SMU scores improved from a median of 61 to 76. Seven of the participants had a decrease in BMI yet the mean decrease in BMI for all participants (from 33 to 31.3) was not significant. Final results of this study show promising results for the use of video nutrition counseling visits. Further research is needed in this area.

#### Conclusion:

The impact of COVID-19 on the education of healthcare professionals has been extreme. Most professions require a supervised practice or experiential learning component. This training is most often highly structured in nature, and has been found to produce quality outcomes in patient care. These rotation type experiences have been dramatically altered due to this pandemic. Much of this supervised practice experience has changed from onsite learning to virtual learning. The assessment of interns' or students' clinical skills by preceptors has also changed dramatically. The incorporation of technology, and the use of alternate practice experiences has been critical for the completion of internships, and fellowships. The use of telesupervision has become commonplace and may forever change the way this is completed. As stated by Bell et al<sup>4</sup>, development of effective, evidence-supported telesupervision methods could greatly increase trainees' and supervisors' (and preceptors') access to one another even when they are not physically proximal, whether they are simply across a large medical complex or across a large rural state. The continued use of these virtual learning and supervisory

techniques may prove critical to the success of many healthcare programs of study. In addition, the continued flexibility of students, interns, preceptors, faculty, and accrediting organizations is crucial to the success of these programs.<sup>19</sup> Questions remain as to how these new medical professionals will perform on competency-based and/or registration type exams in the future.

While much literature exists regarding the use of simulation-type and online learning, there is little research regarding the rapid conversion to this type of learning. Much of the research presented in this review lacks a comparison of remote learning to traditional face to face learning. In addition, there is little research regarding remote supervised practice experience or experiential learning. While there are deficits in the research presented, there are strengths to the studies. Many of the studies compared multiple types of remote or virtual learning. The research also gained the perception of students regarding these various types of learning.

Within the body of research regarding virtual learning, there is an extremely limited amount of research regarding the use of simulation-based, or remote learning in the dietetics profession. In addition, there were no research studies found regarding the preceptors' or employers' perception of remote learning or supervised practice experience. The dietetics profession uses evidence-based practice in order to make medical decisions and provide medical nutrition therapy. The conversion to remote learning has been perceived favorably by most students especially in the development of counseling and interviewing skills. Evaluation methods of this remote learning and supervised practice are inconsistent. According to O'Shea et al<sup>6</sup> more consistent, robust and evidence-based evaluation methods are needed for this remote learning. As is commonly known, simulation type learning is relatively common practice in the nursing profession. It is possible that these guidelines and experiences could be applied to the dietetics profession as well. More research is needed in the use of simulation-based and other types of



remote supervised practice experience in the dietetics profession, as well as, gaining preceptors' and employers' perceptions of the remote learning supervised practice component of dietetics education.

## Chapter 2: Theoretical Framework

### Introduction:

This task is critical as the theoretical framework provides the foundation for the entire research study, design, and formulation of the research questions. One can think of this similar to the blueprints of a house – without these blueprints, the house would not have a direction for building and would lack strength to weather the storms of life. Similarly, the theoretical framework provides the basis and strength to a research study to withstand the critiques of its readers. Because the present research project involves the virtual or remote learning by Dietetic Interns, many distance education theories were reviewed in order to build a theoretical framework for the study.

### Early Distance Education Theories:

Modern theories of distance education date back as far as the early 1970s with Moore's idea of Transactional Distance (term adopted in 1980).<sup>20</sup> Further analysis related to this concept led to important information regarding learning at a distance. According to this theory, distance education is more than a geographical separation of learners and teachers (Preceptors in the context of the present research study). It is a distance of both understanding and perception caused (partially) by geographical distance which must be overcome by the teachers and learners. If this is effective, deliberate and planned learning will occur. Distance learning theories continued to evolve into the 1980s. In 1986, Keegan<sup>21</sup> wrote *The Foundations of Distance Learning* which classified distance education into three groups: theories of independence and autonomy, theories of industrialization of teaching, and theories of interaction and communication. In addition, a fourth category sought to provide an explanation of distance

education by combining existing theories and philosophies of education. From this book and the basics of distance education ideals included, numerous additional theories evolved.

#### Perraton's Distance Education Theory:

In 1988, Perraton<sup>22</sup> developed a theory of distance education composed of a combination of existing theories of communication and various educational philosophies. This theory is composed of 14 statements:

- Any medium can be used to teach anything.
- Distance teaching can break the integuments of fixed staffing ratios that limit the expansion of education when teacher and student are in the same place at the same time.
- There are circumstances under which distance teaching can be cheaper than orthodox education, whether measured in terms of audience reached or of learning.
- The economies achievable by distance education are functions of the level of education, size of audience, choice of media, and sophistication of production.
- Distance teaching can reach audiences not reached by ordinary means.
- It is possible to organize distance teaching in such a way so that there is dialog.
- When a tutor meets a distance learner face-to-face, the tutor's role changes from communicator of information to facilitator of learning.
- Group discussion is an effective method of distance learning to bring relevant information to a group.
- In most communities, there are resources that can be used to support distance learning to its educational and economic advantage.

- A multimedia program is likely to be more effective than one which relies on a single medium.
- A systems approach is helpful in planning distance education.
- Feedback is a necessary part of a distance learning system.
- To be effective, distance teaching materials should ensure that students/learners undertake frequent and regular activities over and above reading, watching, or listening.
- In choosing media, the key decision on which the rest depend concerns the use of face-to-face learning.

The last two of Perraton's 14 standards stand out as particularly important to the current research project:

- Feedback is a necessary part of a distance learning system
- To be effective, distance teaching materials should ensure that students undertake frequent and regular activities over and above reading, watching, or listening

Under normal circumstances, feedback is a necessary part of the Dietetic Internship program. This feedback assists Interns in his/her progress through the program, helps each to grow in the profession of Dietetics, and prepares the Intern to sit for the Registration Examination by the Commission on Dietetic Registration (CDR). This continuous feedback remained necessary during the conversion to virtual supervised practice rotations during the COVID-19 pandemic although this feedback most often took place virtually versus face to face. Interns and Preceptors became more proficient in the use of multiple media platforms. ACEND put forth suggestions regarding types of activities to be used in order to meet the competencies of the Dietetic Internship programs. ACEND continued the suggestion that activities should be real patients or real-life situations instead of case studies from a book or assignments not related to real life

experiences. Examples of these include: video patient visits, completion of electronic medical record documentation, assignments related to community nutrition, and planning catered events using a budget and Intern designed recipes.

### Holmberg's Theory:

In 1995, Holmberg<sup>23</sup> furthered theories of distance education by stating that distance education serves diverse, individual learners who cannot or do not want to make use of face-to-face learning. In this expansion of distance education theories, Holmberg promoted the learners' independence and freedom of choice.<sup>22</sup> In addition, Holmberg put forth the idea that distance education provides liberal study opportunities for individual learners, but more importantly, promotes professional and occupational training.<sup>22</sup> Holmberg characterized distance education by the following five statements:

- All learning concerned with the acquisition of cognitive knowledge and skills, as well as, affective learning is effectively provided by distance education.
- Distance education is based on learning as an individual activity. Learning is guided and supported by noncontiguous means.
- Distance education is open to behaviorist, cognitive, constructivist, and other modes of learning.
- Personal relations, study pleasure, and empathy between students and those supporting them are central to learning in distance education. Feelings of empathy and belonging promote students' motivation to learn and favorably influence learning.
- Even though it is an effective mode of training, distance education runs the risk of leading to mere fact learning and reproduction of accepted truths. It can be organized and

carried out in a way that students are encouraged to search, criticize, and identify positions of their own.

This expansion of distance education theory presents a description of distance education and presents a favorable approach to learning as a whole. More importantly, this theory may serve as the basis for further hypotheses related to distance education.

#### Wedemeyer's Theory of Independent Study:

In 2003, Wedemeyer<sup>22</sup> somewhat modernized the thinking on distance education. He considered the independence of the learner to be the primary key to this type of education. Wedemeyer preferred the term “independent study” for learning which occurred at the university level. Wedemeyer believed that modern technology was under-used, and that the use of this could alter learning at the institution. He set forth a system of distance education which includes ten characteristics emphasizing learner independence and modern technology, saying the system should:

- Be capable of operating any place where students are, even if there is only 1 student. It matters not if there are teachers in the same place at the same time.
- Place greater responsibility for learning on the student.
- Free faculty members from custodial-type duties so that more time can be given to truly education tasks.
- Offer students and adults wider choices (more opportunities) in courses, formats, and methodologies.
- Use, as appropriate, all teaching media and methods that have been proven effective.

- Mix and combine media and methods so that each subject is taught in the best way known at the time.
- Cause the redesign and development of courses to fit into an “articulated media program”.
- Preserve and enhance opportunities for adaptation to individual differences.
- Evaluate student achievements in a simple manner. Barriers should not be raised regarding the place, rate, method, or sequence of student learning.
- Permit students to start, stop, and learn at their own pace.

Three of these ten standards relate to the current research study:

- Be capable of operating any place where students are, even if there is only 1 student. It matters not if there are teachers in the same place at the same time.
- Mix and combine media and methods so that each subject is taught in the best way known at the time.
- Evaluate student achievements in a simple manner. Barriers should not be raised regarding the place, rate, method, or sequence of student learning.

Because of the COVID-19 pandemic, most Dietetic Internship programs were forced to convert onsite supervised practice rotations to a virtual format. This remote learning occurred throughout the United States, in various supervised practice rotations (clinical, food service, community, etc.), and at multiple Internship programs. In a short period of time, remote learning occurred any place where Interns were located.

There were multiple methods used by Interns during the virtual supervised practice rotations. Many Interns obtained relevant patient related medical information using an electronic medical

record (EMR), utilized telephone calls with the patient and/or family/caregiver to obtain additional information, utilized Zoom or other video platforms to attend patient care rounds on a daily basis, completed community nutrition projects, and took part in virtual menu planning and online ordering of food service supplies, as well as, other virtual experiences. In addition, real patient scenarios were used as case studies, and video scavenger hunts helped Interns to learn by combining multiple types of media. Preceptors also used these various media in order to monitor Interns' progress: virtual platforms such as Zoom, case studies, video patient visits, virtual food service projects, etc. Preceptors scheduled daily video visits with Interns in order to review clinical patient care notes and check on assignment progress.

Students were evaluated in the simple manner of “meets” or “does not meet” standards set forth by ACEND. Internship programs tracked hours of virtual supervised practice rotations in order to ensure all Interns met the minimum requirement of 1,000 hours for completion of the program. Program length was extended for some students who struggled with the virtual format.

In addition, Wedemeyer set forth an additional six characteristics of an independent study system:

- The student and teacher are separated.
- The normal processes of teaching and learning are carried out in writing or through some other medium.
- Teaching is individualized.
- Learning takes place through a student's activity.
- Learning is made convenient for the student in the student's own environment.
- The learner takes responsibility for the pace of learning, with freedom to start and stop at any time.



Of these six characteristics, three pertain to the current research study:

- The learner and teacher are separated.
- The normal process of teaching and learning are carried out in writing or through some other medium.
- Learning takes place through the learners' activity

Because of the COVID-19 pandemic, many Dietetic Interns (learners) and Preceptors (teachers) were forced to work and/or complete the supervised practice component of the Internship programs remotely. This separated the Interns and Preceptors for an extended period of time (some remain separated). This separation occurred for differing periods of time based on the location of the Internship program, and rules of the facility in which the supervised practice experience occurred.

As discussed previously, the supervised practice component of the Dietetic Interns' learning was completed using a variety of media formats ranging from Zoom, Webex, patient EMR documentation review, and video or telephone patient visits.

Learning took place via the learners' activity which consisted of similar experiences outside of the hospital or facility setting. Some Interns were able to complete clinical patient visits virtually while others completed food service and community projects off site.

As stated previously, if distance education is successful, deliberate and planned learning will occur.

### Equivalency Theory:

While parts of the aforementioned theories pertain to the current research project, the Equivalency theory most closely provides a theoretical framework for the study. Simonson's equivalency theory<sup>22</sup> states that education at a distance should be built on the concept of equivalency of learning experiences. The more equivalent the experiences, the more equivalent the outcomes of the learning. Equivalency and equality are not the same thing. In the context of the present research study, Intern rotations which provide onsite learning are not equal to those rotations completed virtually. These experiences can be equivalent but cannot be equal. In the case of the COVID-19 pandemic, Internship programs were forced to develop and/or find experiences specifically tailored to the situation in which Interns and Preceptors found themselves. The use of virtual platforms became essential to the development of equivalent supervised practice rotations.

There are five key elements to the Equivalency theory<sup>22</sup>:

- Equivalency – This is the central component of the Equivalency theory. It is important to remember that local (onsite in this case) and distance (virtual) learners have different learning environments. It becomes the responsibility of the educator (Program Directors in the present research project) to design learning activities with equivalent value.
- Learning Experience – This experience is anything that happens to the student to promote learning, including what is seen, felt, heard, or done. As it pertains to the current research study, depending on the specific supervised practice rotation, interns need a different mix of learning experiences and may require differing amounts of observation and/or feedback from Preceptors.

- **Appropriate Application** – This element pertains to the suitability of learning experiences. These experiences should suit the needs of the individual learner (in the case of the current project, the needs of the learner and specific rotation). In addition, the learning experiences should be properly tailored to the situation and timely.
- **Students** – Students (Interns) should be defined by his/her enrollment into the Internship program; not by location of the experiences.
- **Outcomes** – These include the obvious, measurable, and significant changes that occur because of participation in a course or program. In the case of the current research project, the outcomes would be successful mastery of all competencies set forth by ACEND for Dietetic Internship programs. Outcomes consist of two categories: those that are instructor (or ACEND) determined, and those that are learner determined.

The Equivalency theory has shown that face-to-face learning can provide similar outcomes to that of distance learning. A 2016 small quasi-experimental study by Reed et al<sup>24</sup> sought to prove that the outcomes of student grades, student satisfaction, and student retention were similar whether a Psychology class was taught online or face-to-face. Results of this study showed that students grades were not significantly different when comparing like assignments. It was found that when different assignments (non-equivalent assignments) were given to students in the face-to-face and online classes that grades were significantly lower in the online class. This is consistent with the central element of Equivalency theory that all experiences should be equivalent no matter the mode of learning. Student satisfaction was similar for either mode of learning. Student retention was higher in those utilizing face-to-face learning. This was said to be, in part, due to student characteristics versus the actual learning or class. The results of this

study can be cautiously interpreted to support the Equivalency theory: online and face-to-face learners will attain like outcomes when equivalent learning experiences are offered.

Simonson<sup>25</sup> says that remote teaching can be described as the rapid, generally unplanned, and even chaotic separation of teachers and students from one another by requiring all involved in the education process to teach or learn remotely. The COVID-19 pandemic made it necessary for most Dietetic Interns to complete the supervised practice component of the Internship program virtually. In addition, many preceptors were forced to work remotely for an extended period of time. These same preceptors found it necessary to monitor intern performance virtually. Program Directors quickly developed virtual supervised practice activities and rotations in order for Dietetic Interns to achieve competency of the ACEND standards and complete Internship programs. It would have been impossible for the virtual supervised practice experiences to be equal to the onsite experiences. These experiences could, however, be designed to be equivalent. This idea of equivalent experiences for virtual and face-to-face learners is central to Simonson's Equivalency theory (Table 1). Supervised practice experiences were quickly developed for Interns based on the medical crisis the world found itself in during 2020. The Equivalency theory shows us that by creating these equivalent experiences similar outcomes may be achieved virtually as compared to face-to-face (onsite) learning. Preceptors and interns alike adapted to the virtual platforms and found (likely) methods to achieve similar outcomes and competence in ACEND standards

### Conclusion:

This research study will compare Intern and employer perception regarding the quality of preparation in virtual SPE, and RD exam pass rate for 2019 (standard, onsite rotations completed) and 2020 (partial completion of rotations virtually). Because of the equivalency of the activities to complete these virtual rotations, it is hypothesized that there will be no significant difference in RD exam pass rate and scores between these two types of learners.

While the overall quality of preparation of the virtual supervised practice experience for the RD exam is not expected to be statistically significant, it is anticipated that the soft skills (Table 7) will be weaker in those Interns who participated in virtual supervised practice rotations. With these weaker soft skills, newly hired Dietitians who participated in virtual supervised practice experiences may require additional on-the-job training and/or company specific training classes to become fully competent in these skills.

### Chapter 3: Methods

This study will gather and assess the perception of Dietetic Interns and employers regarding the virtual supervised practice experience during the COVID-19 pandemic with regards to the quality of preparation for both CDR's Registration examination (RD exam) and beginning practice in the field of Dietetics. The study will also compare the RD exam pass rates between the graduated classes of 2019 (no virtual SPE) and 2020 (some virtual SPE). Because the pandemic is so recent, there is no previous data of this kind published. Based on this researcher's observation and discussion with preceptors, Interns, and employers, it is hypothesized that there will be no significant difference in the pass rate for CDR's Registration examination or for the graduated Interns' preparation for practice in the field of Dietetics. This research project will help to determine if there are differences in the quality of preparation in virtual versus onsite supervised practice experience.

Interns are required to have completed at least one supervised practice rotation virtually. Employers are required to have hired a Dietitian who completed at least one supervised practice rotation virtually. Those Program Directors providing the average pass rate of the RD exam for the classes of 2019 and 2020 must have utilized virtual supervised practice learning for at least one rotation in 2020.

#### Study Aims:

- To identify perceptions of dietetic interns about virtual supervised practice rotations regarding the quality of preparation for the RD examination and practice in the field of Dietetics

- To identify the perceptions of employers regarding the quality of preparation of virtual supervised practice experience for new graduates.
- To determine which specific supervised practice rotations were completed virtually.
- To compare the scores of the RD exam with Interns completing a portion of his/her Program virtually (class of 2020) to those completing his/her Program in the standard manner with no virtual component (class of 2019).

*Research Question:* Does virtual supervised practice experience adequately prepare interns (graduated) for CDR's Registration examination and practice in the field of Dietetics?

*Long term Goals:* First, to understand Intern and employer perceptions of virtual supervised practice experience regarding the quality of preparation for Dietetics practice. Second, to compare RD exam scores of interns completing his/her learning virtually to those completing learning in the standard method.

#### Study Design:

The proposed study will use a mixed methods approach combining both qualitative and quantitative research. The qualitative portion of the study will use thematic and phenomenological analysis whereas the quantitative portion of the study will use a cross-sectional, comparative design.

Creswell<sup>26</sup> stated that mixed methods research is more simply the collection of two independent strands of quantitative and qualitative data. Mixed methods research involves the connection, integration, or linking of both quantitative and qualitative data.

Cross-sectional mixed methods research studies are well suited for examining information from different groups by combining quantitative and qualitative approaches in order to make inferences about a particular population of interest (in the case of the present study: employers and Dietetic Interns) at a given point in time.<sup>27</sup> A cross-sectional design is appropriate for use in the present study as it will survey employers and Dietetic Interns (from ACEND accredited Dietetics programs) but does not expect to receive results from each of these 608 Programs in existence. The survey responses received can be extrapolated to determine perceptions of employers and Dietetic Interns, as well as overall pass rate for the CDR Registration examination for the United States as a whole.

Greene et al<sup>28</sup> suggested five purposes for using mixed methods research: triangulation, complementarity, development, initiation, and expansion.

- Triangulation – More than one method is used to gather and analyze data about the same information. This seeks corroboration of results for the purpose of eliminating the inherent bias that can be found when using only one research method. This also helps to test the consistency from both quantitative and qualitative research results.
- Complementarity – Different phenomena are used to amplify and enhance results from research by using findings from another methodology.
- Development – Results from one stage of research in a sequential design are used in the development of methods for the next stage of research.
- Initiation – Contradictions and new or differing perspectives are sought in order to find out the cause(s) of inconsistencies in research.
- Expansion – Different methods are used to extend the breadth and depth of an investigation.



In furthering the explanation of mixed methods research, Creswell<sup>29</sup> presented three designs: Convergent, Explanatory Sequential, and Exploratory Sequential Design.

- Convergent Design – Quantitative data and results provide general trends and relationships while the qualitative results provide a more in-depth personal perspective of individuals. Merging of these two types of data provides a more complete understanding that what could have been provided from one type of data alone. As a result of this design, researchers are able to advance multiple perspectives or validate databases with one another.
- Explanatory Sequential Design – A study begins with the quantitative component and a subsequent qualitative component follows. As a result of this research design, researchers are able to draw inferences about how the qualitative results help to explain the quantitative results.
- Exploratory Sequential Design – A study begins with a qualitative data collection, and a subsequent quantitative phase follows. As a result of this study design, researchers can determine how the quantitative component improves upon the set of variables, provides a new or better instrument, enhances the workability of the intervention, or adds insight into the generalizability to a larger sample.

For the present research study, the Explanatory Sequential design will be used. The study will begin with a survey sent to Program Directors, graduated Interns, and employers. The Program Director survey will gather data regarding RD Exam pass rates for his/her Dietetics program. The survey to graduated Interns will identify the number of Interns who passed the RD exam on the first attempt and those who passed the RD exam within the first year. The

qualitative portion of the study will follow with interviews from four different groups: interns graduated in 2019 with no virtual SPE, interns graduated in 2020 with some virtual SPE; employers hiring a 2019 graduate; and employers hiring a 2020 graduate. The qualitative portion of the study will identify intern and employer perspectives on the quality of preparation of virtual versus onsite SPE.

*Strengths of the current Research Study:* The current research study has two primary strengths. First, this study is a unique mixed methods design regarding the quality of preparation of virtual supervised practice experiences for the RD exam and beginning Dietetics practice during the COVID-19 pandemic. At this time, there are no published studies which assess this virtual SPE during the pandemic. The second strength of the current research study is that the researcher served as a preceptor, as well as, an employer, both before, during, and after the COVID-19 pandemic. The researcher is well versed on clinical, food service, and community supervised practice rotations. The researcher developed a virtual food service and clinical supervised practice rotation for one Internship Program and served as the preceptor for this. In addition, the researcher is an ACEND Reviewer and is well versed in the standards for Dietetics Programs set forth by the organization.

*Inherent Biases:* The primary inherent bias in the present study stems from Interns' loyalty to his/her Dietetics program or place of employment. Interns may be less likely to reveal a negative perception of the virtual supervised practice experience because of this. In addition, employers may feel a certain sense of loyalty to a particular Dietetics program which frequently provides employees to the company.

### Study Participants and Setting:

*Population of Interest:* The population of interest includes these groups: Dietetic Interns, employers, and Program Directors.

- Dietetic Interns must have completed at least one supervised practice rotation virtually.
- Employers must have hired at least one intern who completed at a minimum of one virtual rotation.
- Program Directors must have converted from onsite or face to face supervised practice rotations to virtual ones.
- The comparison group will include Dietetic Interns who graduated in 2019.

*Inclusion Criteria:* Dietetic Interns, employers, and Program Directors who meet the criteria outlined above.

*Exclusion Criteria:* Dietetic interns, employers, and Program Directors who meet the following criteria will not be included in the study:

- Employers who hired a graduated (2020) Intern who did not complete any virtual supervised practice rotations.
- Dietetic Interns who completed supervised practice rotations that were initially planned as virtual (versus those which were changed to virtual)
- Program Directors who did not convert supervised practice rotations from onsite or face to face to virtual/remote

*Setting:* Only ACEND accredited Dietetics Programs will be used in this study. These include: Dietetic Internships, Coordinated Programs, and Future Education Model Programs. Surveys will be sent to all ACEND accredited Programs.

*Sample Size and Power Calculation:*

Quantitative Portion of the Study: In order to determine sample size of the survey portions of the research study, the following calculators were used: [www.powerandsamplesize.com](http://www.powerandsamplesize.com), and [www.qualtrics.com/blog/calculating-sample-size](http://www.qualtrics.com/blog/calculating-sample-size).

For the survey to Program Directors regarding the RD exam pass rate, the powerandsamplesize.com calculator was used: the true mean used was 83, the null hypothesis mean used was 80, and the standard deviation used was 6.

- Sample size required: 32
- Power: 0.80
- Confidence Interval: 95%

For the survey to graduated Interns, ACEND data regarding the number of graduates per year was reviewed. The number of graduates from Coordinated Programs, Dietetic Internships, and Future Graduate Programs (FEM) was totaled for each year. Those numbers were used in order to calculate the sample size needed for the survey sent to Interns. The Qualtrics sample size calculator was used to compute the sample size for this survey.

2019: The number of graduates (population size) was 4870.

- Sample size required: 357
- Confidence Interval: 95%
- Margin of Error: 5%

2020: The number of graduates (population size) was 4700.

- Sample size required: 356
- Confidence Interval: 95%
- Margin of Error: 5%

For the employer survey, an average employment rate of 90% for graduating Interns beginning employment in the field of Dietetics was used. The Qualtrics sample size calculator was used to compute the sample size for this survey.

2019: The population size was 4383 (90% of the total graduates for that year).

- Sample size required: 354
- Confidence Interval: 95%
- Margin of Error: 5%

2020: The population size was 4230 (90% of the total graduates for that year).

- Sample size required: 353
- Confidence Interval: 95%
- Margin of Error: 5%

### Qualitative Portion of the Study:

Fusch and Ness<sup>30</sup> stated that there is no one size fits all method to achieving data saturation but that this can be reached in as few as six interviews depending on the sample size. In addition, data should be both rich (quality) and thick (quantity). Having rich data that is not thick or thick data that is not rich will not achieve data saturation and may lead to skewed qualitative results.

Interviews will be conducted with six to ten (6-10) Interns, and employers from each of the following groups:

- Interns who graduated in 2019
- Interns who graduated in 2020
- Employers who hired at least one 2019 graduated intern
- Employers who hired at least one 2020 graduated intern

*Statistical Analysis:* In order to complete the statistical analysis of project results, the following tests will be completed:

- Qualitative Portion of Study: Memoing, Coding, Theming, and development of a Codebook. Individual interviews will be conducted with the groups outlined above. All interviews will be recorded and transcribed verbatim from the audio and video recordings. All verbatim information will be coded for categories, sub-categories, patterns, and themes. An initial codebook will be created and organized into primary and secondary themes. Each theme will be defined. A second reader will review the transcriptions. Any interpretation discrepancies will be discussed between both readers, and the codebook will be refined to eliminate ambiguity. Additional themes may be

added during this discussion. In a pilot interview and focus group, themes which emerged included: feelings (perceptions) regarding virtual work, comfort and experience levels regarding virtual work, technology used for virtual work, and level of training for Dietetics practice. It is expected that similar themes will emerge during the interview portion of the present research study.

At the end of both the Intern and Employer surveys, respondents are asked if he/she would be willing to participate in a short interview regarding experience with the SPE and/or hiring of a newly graduated Intern.

- **Quantitative Portion of Study:** In order to determine if the results are normally distributed, a histogram will be completed. If results are normally distributed, an independent *t*-test will be completed using the SPSS system. The surveys to Interns and employers will be Likert scale (Scale of 1-5). The mean for central tendency will be calculated for questions regarding quality of preparation for taking the RD exam (intern survey), and the quality of preparation for beginning practice in the field of Dietetics (intern and employer survey results calculated separately). In addition, the chi square test will be used to compare questions on the intern survey regarding the passing of the RD exam.

### Data Collection:

Surveys for interns (Table 2) and Program Directors (Table 4) will be emailed to Program Directors. Program Directors will be asked to forward the surveys to Dietetic Interns who graduated in 2019 and 2020.

### *Methods of Data Collection:*

- Telephone interviews may be conducted with those persons who are not able to fill out the survey but who still wish to provide information regarding these virtual supervised practice rotations
- Graduated Dietetic Interns are asked on the survey if he/she would be willing to send a survey to their first employer following graduation. If agreeable, the Intern will be sent a survey to forward to this Employer (Table 3).
- On both the Intern and Employer surveys, each group is asked if he/she would be willing to participate in a short interview regarding the experience with the SPE component of the Internship program, quality of preparation for taking the RD exam, and quality of preparation for beginning practice in the field of Dietetics. Interview guides are provided in Tables 5 and 6.
- In order to increase participation in the interviews, there will be a drawing for one (1) \$50 Amazon gift card for each group (Interns and Employers)

*Primary Objective:* To better understand the effectiveness and quality of virtual supervised practice rotations for Dietetic Interns.



*Data/Outcomes to be collected:* See Tables 2, 3, and 4 for the specific questions asked of each group included in the study.

*Expected Outcomes:* The primary outcome of this study is to determine if differences exist in onsite/face to face versus virtual supervised practice experience in producing well-prepared entry level Dietitian Nutritionists. In addition, it is hypothesized that any difference in the pass rates for 2019 and 2020 for the RD examination will not be statistically significant. It is expected that the perceptions of Dietetic Interns when the virtual SPE began to be negative but that after a few months working virtually, this perception changed to a more positive one.

#### Conclusion:

With numerous Dietetic Interns completing internship Programs virtually/remotely during the COVID-19 pandemic, this research is timely and important. The results of this study could help to design and potentially pilot a virtual/remote supervised practice Program for use in the future. This would allow Dietitians to continue working remotely (if necessary) and dietetic interns to complete internship Programs virtually.

## Chapter 4: Results

This mixed methods study sought to gather and assess the perception of graduated Dietetic Interns and employers regarding the level of preparation for CDR's Registration Examination and beginning practice in the field of Dietetics before the COVID-19 pandemic versus post COVID-19 pandemic. In addition, the pass rate for the RD exam was compared between the class of 2019 (those with no virtual SPE) and 2020 (some virtual SPE). In order to accomplish this, surveys were sent to Program Directors in the United States, and graduated Interns from the classes of 2019 and 2020. These graduated Interns were asked to forward a survey to his/her first employer after graduation. In addition, these graduated Interns were asked about his/her willingness to participate in an interview regarding their experience with the virtual SPE during the COVID-19 pandemic. ACEND distributed a survey to Program Directors earlier in 2021 regarding virtual SPE, changes made to Dietetics Programs, and training. Results from ACEND's Spring survey (January 2021) to Program Directors were analyzed by this researcher and yielded the following results from the 324 respondents.

- The rotations completed most often virtually (at least partially) were: Community, Outpatient, and Food Service rotations
- Other rotations completed at least partially in the virtual environment include: Research, School Food Service, Sports Nutrition and Eating Disorders
- Seventy-two percent (72%) of the respondents offered online professional coursework, and only 37% of respondents offered Didactic courses online
- Sixty-six percent (66%) of respondents indicated that more than 50% of coursework was converted to the online format during 2019 or 2020

- Only 26% of the respondents were offered one on one or online training regarding the conversion to virtual or online rotations or coursework

These results begin to illuminate the quick conversion to the online or virtual format for both SPE rotations and coursework and provide background information for the present research study.

In terms of the present research study, during mid-October 2021, the initial surveys were sent via email to 343 Program Directors throughout the United States. These surveys inquired about virtual SPE, RD Exam pass rate, and changes made to the Dietetics Program in 2019 and 2020 during the COVID-19 pandemic. In addition, surveys for graduated Interns were sent to these same 343 Program Directors. Program Directors were asked to forward these surveys to Interns who had graduated in either 2019 or 2020. Both surveys and a reminder email were sent again via email to Program Directors approximately 10 days after the initial email. Program Directors and graduated Interns were given 3 weeks to complete the survey. Lastly, one question on the survey to graduated Interns asked of his/her willingness to forward a survey to his/her first Employer after graduation regarding the degree of preparation to practice Dietetics for that new Dietitian.

#### Results from Surveys:

*Program Director Survey:* The two emails sent to these 343 Program Directors yielded an 11.4% response rate (39 responses). Ninety-five percent (95%) of respondents (n = 37) indicated that at least some of the Supervised Practice rotations were completed virtually in either 2019 or 2020. Only 5% of respondents (n = 37) indicated that no Supervised Practice rotations were completed virtually in either 2019 or 2020. Mean for the pass rate of the Registration

Examination in 2019 and 2020 was as follows:

	Number of Respondents	Mean of Pass Rate
Graduated class of 2019	14	85%
Graduated class of 2020	17	88%

From these results, there is no statistical significance between the mean RD exam pass rate between the class of 2019 ( $M = 85\%$ ,  $SE = 3.60$ ) with no virtual SPE and the class of 2020 ( $M = 88\%$ ,  $SE = 3.41$ ) with at least some virtual SPE,  $t(29) = -.671$ ,  $p = .508$ ,  $r = -.154$ ,  $Cohen's d = -.242$ , 95% CI [-13.53, 6.85]. In addition, a *Cohen's d* value of -.242 represents only a small effect of the virtual SPE on the mean pass rate of the RD exam.

During the COVID-19 pandemic, ACEND decreased the number of required hours for Dietetics programs. Program Directors were asked about any changes in Program domains due to these decreased hours. Seventy-six percent of respondents ( $n = 21$ ) indicated no change in Program domains due to the decreased hours requirement by ACEND. Only 24% of respondents ( $n = 21$ ) indicated a change in Program domains. All of these changes resulted in either a decrease in the overall hours requirement for the Program or a decrease in hours for a specific rotation.

Program Directors were asked what changes were made in order to virtually/remotely meet these updated ACEND standards. The responses to this question can be seen in the Table below:

Program Director Response ( $n = 22$ )	Frequency of Response received
Supervised Practice activities customized to be completed virtually	5
Long Term Care rotation became virtual	1
Increased number of online Hours with Preceptors and Program Director	3
Virtual Hospital and/or EMR used	5
Case Studies or Online Self-Study modules created	4
Increased use of Simulation	5
Virtual Clinic visits with patients	2

In addition, Program Directors were asked a question regarding the soft skills (Teamwork, Ethics, Initiative, Confidence, Compassion, and Flexibility) and how these were addressed in the virtual or online environment. Fifty percent (50%) of respondents (n = 20) indicated no change in the manner in which these soft skills were addressed during the COVID-19 pandemic.

Twenty percent (20%) of respondents (n = 20) indicated there was a change to the manner in which these skills were addressed but did not elaborate as to how this changed during the pandemic. Thirty percent (30%) of respondents (n = 20) indicated that these soft skills were addressed during Zoom sessions with Preceptors, the Program Director, and/or classmates

Lastly, Program Directors were asked a question regarding any advantages to the virtual SPE experience. Twenty-five percent (25%) of respondents (n = 20) found no advantages or benefits to the virtual SPE. Seventy five percent (75%) of respondents (n = 20) indicated at least one advantage to the virtual SPE. Advantages as seen by Program Directors were as follows:

Program Director Response (n = 20)	Frequency of Response received
Increased safety by keeping Interns home	3
Some clinical skills, such as Note writing, better learned virtually	2
Increased flexibility for Interns	7
Less travel for Interns	3
Increased knowledge & use of Technology	5

*Graduated Intern Survey:* Surveys were forwarded via email to Interns who graduated from a Dietetics Program in either 2019 or 2020. There were 37 total responses to this survey of graduated Interns. While not statistically significant, the answers to the questions on this survey may begin to show a trend in the completion of virtual SPE and the graduates' preparation for both the RD exam and beginning practice in the field of Dietetics.

All of the 37 respondents indicated graduation year. Twenty-four percent (24%) of respondents graduated in 2019, and 76% of respondents graduated in 2020. Eighty-six percent

(86%) of respondents (n = 36) indicated that at least part of the Supervised Practice experience was virtual, and only 14% of respondents (n = 36) indicated that none of the SPE was virtual. Of these 5 respondents reporting no virtual SPE, 4 graduated from a Dietetics Program in 2019, and only 1 graduated in 2020. Frequency regarding the percent of virtual SPE can be seen in the table below:

Percentage of Virtual SPE (n = 31)	Frequency of Response	Percentage of Response Frequency
1 – 25%	15	48%
26 – 50%	8	26%
51 – 75%	5	16%
>75%	3	10%

Responses regarding the specific rotations which were completed virtually varied somewhat as can be seen in the table below. These responses reflect some of the same information gathered from the ACEND survey to Program Directors which indicated the SPE rotations completed virtually most often were Community, Outpatient and Food Service. The Community rotation was reported as the most frequently completed virtually by the graduated Interns, yet the Clinical rotation was reported as the second most frequent rotation completed virtually. The report of the Clinical SPE virtual completion shows different results when compared to the ACEND Program Director survey. Of the “Other” category, the Elective or Enrichment rotation was most frequently completed in the virtual platform.

Rotation completed Virtually (n = 30)	Frequency of Response	Percentage of Response Frequency
Clinical	7	23%
Community	12	40%
Food Service	1	3%
Other	9	30%
Outpatient	1	3%

Three questions on the graduated Intern survey pertained to the RD exam: preparation for this, pass or fail on the first attempt, and pass within the first year after graduation. The first question regarding the level of preparation for the RD exam used a Likert scale to measure feelings of preparation.

Level of Preparation – RD Exam (n = 34)	Frequency of Response	Percentage of Response Frequency
Completely Prepared	5	15%
Somewhat Prepared	18	53%
Neither Prepared or Unprepared	1	3%
Somewhat Unprepared	7	20%
Completely Unprepared	3	9%

The difference in the level of preparation for the RD exam between the class of 2019 (n = 4) with no virtual SPE, ( $M = 2.25$ ,  $SE = .946$ ) and the class of 2020 (n = 25) with at least some virtual SPE, ( $M = 2.44$ ,  $SE = .217$ ) was not statistically significant,  $t(3.32) = -.196$ ,  $p = .856$ ,  $r = -.25$ , *Cohen's d* =  $-.158$ , 95% CI [-3.12, 2.74]. In addition, a *Cohen's d* value of  $-.158$  represents only a small effect of the virtual SPE on the level of preparation for the RD exam.

The second question regarding the RD exam for the graduated Interns asked about the passing of the RD exam on the first attempt. Of the 34 respondents to this question, 23 of the respondents (68%) reported yes, on passing this exam on the first attempt whereas 11 respondents (32%) of respondents reported no, on passing this exam on the first attempt.

We can also compare perceived level of preparation for the RD exam with percent of virtual SPE rotation completion (n = 29):

Level of Preparation	1-25% Virtual SPE	26-50% Virtual SPE	51-75% Virtual SPE	>75% SPE
Completely Prepared	1	0	2	1
Somewhat Prepared	7	6	2	2
Neither Prepared or Unprepared	0	0	0	1
Somewhat Unprepared	4	1	0	0
Completely Unprepared	1	1	0	0

In addition, we can compare perceived level of preparation for the RD exam, percent of virtual SPE, and not passing of the RD exam on the first attempt (n = 9):

Level of Preparation	1-25% Virtual SPE	26-50% Virtual SPE	51-75% Virtual SPE	>75% SPE
Completely Prepared	0	0	0	0
Somewhat Prepared	2	0	0	1
Neither Prepared or Unprepared	0	0	0	0
Somewhat Unprepared	3	1	0	0
Completely Unprepared	1	1	0	0

Results of these questions regarding the passing of the RD exam on the first attempt begin to show a trend regarding the percentage of virtual SPE, level of preparation, and passing the RD exam on the first attempt. These results indicate that the percentage of virtual SPE does not have an impact on the level of preparation and/or the passing of the RD exam on the first attempt,  $\chi^2(1) = .141, p = .708$ .

The question to graduated Interns regarding passing the RD exam within the first year of graduation yielded these results: Twenty-six (n = 31) or 84% of respondents indicated “yes” on passing the RD exam within the first year of graduation. Five (n = 31) or 16% of respondents indicated “no” on passing the RD exam within the first year of graduation. Of the 5 graduated Interns who did not pass the RD exam within the first year of graduation, perceived level of exam preparation, and percentage of virtual SPE varied.

Level of Preparation for RD Exam (n = 5)	1-25% Virtual SPE	26-50% Virtual SPE	51-75% Virtual SPE	>75% Virtual SPE
Completely Prepared				
Somewhat Prepared	2 (2020)			
Neither Prepared or Unprepared				1 (2020)
Somewhat Unprepared				
Completely Unprepared	1 (2020)	1 (2019)		



While not statistically significant, similar to the questions regarding preparation for and passing the RD exam on the first attempt, results of this question may begin to show a trend regarding the percentage of virtual SPE, level of preparation, and passing the RD exam within the first year of graduation. These results indicate that the percentage of virtual SPE does not have an impact on the level of preparation and/or the passing of the RD exam within this first year,  $\chi^2(1) = .105, p = .746$ .

The last question on the graduated Intern survey asked about perceived level of preparation to begin practice in the field of Dietetics. This question used a 5-point Likert scale to measure the level of preparation.

Level of Preparation – Dietetics Practice (n = 33)	2019 Graduation	2020 Graduation
Completely Prepared	4	2
Somewhat Prepared	4	16
Neither Prepared or Unprepared	0	2
Somewhat Unprepared	1	4
Completely Unprepared	0	0

Of the respondents to the question regarding level of preparation to begin Dietetics practice, 28 respondents also indicated percentage of virtual SPE.

Level of Preparation – Dietetics Practice (n = 28)	1-25% Virtual SPE	26-50% Virtual SPE	51-75% Virtual SPE	>75% Virtual SPE
Completely Prepared	2	0	1	0
Somewhat Prepared	7	6	3	2
Neither Prepared or Unprepared	0	2	0	0
Somewhat Unprepared	3	0	1	1
Completely Unprepared	0	0	0	0

In addition, 27 respondents indicated level of preparation and specific virtual SPE rotations.

Level of Preparation – Dietetics Practice (n = 27)	Virtual Clinical Rotation	Virtual Food Service Rotation	Virtual Community Rotation	Virtual Outpatient Rotation	Virtual Other Rotation
Completely Prepared	0	2	2	1	0
Somewhat Prepared	5	1	6	0	5
Neither Prepared or Unprepared	0	0	2	0	0
Somewhat Unprepared	1	0	1	1	3
Completely Unprepared	0	0	0	0	0

Again, while not statistically significant, the results from these questions begin to show that the percent of virtual SPE,  $\chi^2 (9) = 9.39, p = .402$  and specific virtual SPE rotation,  $\chi^2 (12) = 12.08, p = .439$ , do not have an effect on the level of preparation to begin practice in the Dietetics field.

Two respondents to the graduated Intern survey indicated willingness to forward a survey to his/her first Employer after graduation. Employer surveys were sent to these two respondents and the Employer surveys were sent via email to these two Employers. No responses to these two surveys were received.

Ten respondents of the graduated Intern survey indicated willingness to participate in an interview regarding his/her experience with virtual SPE. All of these ten respondents provided an email contact in order to schedule an interview.

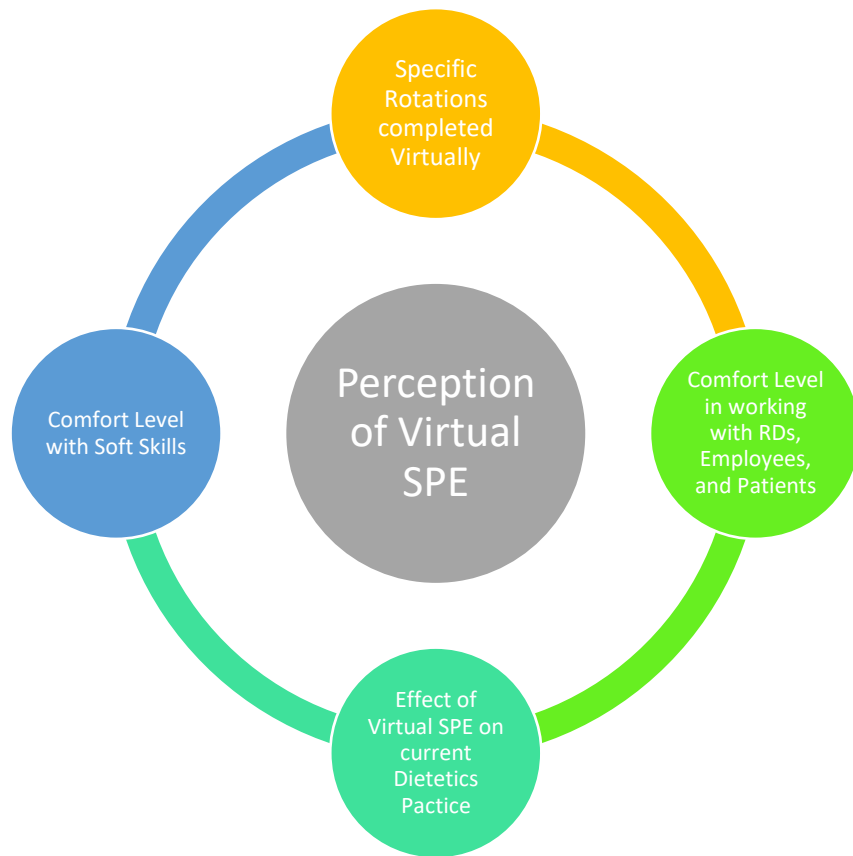
### Results from Interviews:

An email was sent to all ten respondents who indicated willingness to participate in an interview regarding his/her experience with virtual SPE. Three graduated Interns responded to this email and were scheduled for interviews within 10 days. A reminder email was sent to the remaining seven graduated Intern respondents. No response was received to either of these two emails from the remaining seven graduated Interns.

Interviews were conducted via Zoom. Two of the graduated Interns participating in the interviews agreed to recording of the interviews; one of the graduated Interns participating did not agree to recording of the interview. Notes were taken during the interviews, and transcripts were created after watching the two recorded interview sessions. Three transcripts were reviewed. Memos, codes and themes were noted on the transcripts in order to create a codebook. Once these actions were complete, all transcripts were provided to another RD for review. This RD was a Preceptor during 2019 and 2020 and provided both in person and virtual SPE experiences for Interns. No new themes or codes were noted after the second RD reviewed all transcripts.

While saturation was not reached with these 3 interviews, and the results are not statistically significant, the themes, categories, and codes can be found in the following pages.

Major themes identified in the interviews include the following:



The following codes, descriptions, and examples were derived after review of the transcripts:

Code	Description	Example
Virtual Work	Specific Rotations completed Virtually	“Mostly Community rotation and I guess you would call it my Elective rotation.”
Hours	Hours spent on Virtual Rotations	“In my Food Service rotation, I did 32 hour weeks for 6 weeks.”
Tracking	Methods of Tracking Virtual Hours	“We were in charge of tracking our own hours, so I made a spreadsheet to keep track of my hours.”
Training	Comfort level with Dietitian practice	“I did feel comfortable starting practice but struggled with getting into a management role right out of school.”
	Current area of practice	“I did feel comfortable starting practice. My virtual rotations didn’t exactly apply to the job I am doing now so that may have played a role in my comfort.”
	Effect of COVID on Rotations	“I think it depended on the rotation and what I was allowed to do. Some rotations were not helpful because I was sent home and nothing was planned virtually.”
Soft Skills	Method of addressing Soft Skills	“Virtually and in person. We were able to learn a lot from each other. We had several opportunities for public speaking also.”
Work w/ Others	Comfort level in talking to patients	“My comfort level grew exponentially because all of my Clinical and Food Service rotations were in person. I know people who had virtual clinical rotations and they did not walk out of their internship ready or confident to start a job.”
	Comfort level in working with other RDs	
	Comfort level in working with Employees	
Virtual SPE	Overall impression of virtual SPE	“I would tell a student to shoot for as much in person experience as possible.”
		“I loved the virtual experience because we got to do things on our own timeframe.”
		“I liked getting to do projects I wouldn’t get to do normally.”
	Benefits to virtual rotations	“In some ways the virtual rotations were better for me. I was able to do a lot of different kinds of projects.”

The following codebook was created after review of the transcripts.

Themes	Graduated Intern Interviews	How often mentioned/discussed	Which Codes intersect
<b>Virtual Rotations</b>	<ul style="list-style-type: none"> <li>Community</li> <li>Elective/Enrichment</li> <li>Food Service</li> <li>Long Term Care</li> </ul>	<ul style="list-style-type: none"> <li>Twice</li> <li>Twice</li> <li>Once</li> <li>Once</li> </ul>	<ul style="list-style-type: none"> <li>Virtual SPE</li> </ul>
<b>Hours</b>	<ul style="list-style-type: none"> <li>100-200 hours</li> <li>201-400 hours</li> </ul>	<ul style="list-style-type: none"> <li>Once</li> <li>Twice</li> </ul>	<ul style="list-style-type: none"> <li>Tracking</li> </ul>
<b>Tracking</b>	<ul style="list-style-type: none"> <li>Individual Spreadsheet</li> <li>Program provided Method</li> <li>No Tracking</li> </ul>	<ul style="list-style-type: none"> <li>Twice</li> <li>Once</li> <li>Once</li> </ul>	<ul style="list-style-type: none"> <li>Hours</li> </ul>
<b>Training</b>	<ul style="list-style-type: none"> <li>Technology used</li> <li>Specific rotations virtual &amp; current Area of RD Practice</li> <li>Comfort level w/ Practice</li> </ul>	<ul style="list-style-type: none"> <li>Twice</li> <li>Twice</li> <li>Three times</li> </ul>	<ul style="list-style-type: none"> <li>Virtual Rotations</li> </ul>
<b>Soft Skills</b>	<ul style="list-style-type: none"> <li>Addressed virtually</li> <li>Addressed in person</li> </ul>	<ul style="list-style-type: none"> <li>Twice</li> <li>Twice</li> </ul>	<ul style="list-style-type: none"> <li>Virtual Rotations</li> </ul>
<b>Working with Others</b>	<ul style="list-style-type: none"> <li>Comfort level w/ patients</li> <li>Confidence level</li> </ul>	<ul style="list-style-type: none"> <li>Three times</li> <li>Three times</li> </ul>	<ul style="list-style-type: none"> <li>Virtual Rotations</li> <li>Soft Skills</li> <li>Training</li> </ul>
<b>Virtual SPE</b>	<ul style="list-style-type: none"> <li>Feelings about virtual Clinical rotations</li> <li>Missing elements from virtual rotations</li> <li>Benefits of virtual rotations</li> </ul>	<ul style="list-style-type: none"> <li>Three times</li> <li>Twice</li> <li>Twice</li> </ul>	<ul style="list-style-type: none"> <li>Virtual Rotations</li> <li>Training</li> </ul>

#### *Basic Information – Interview Participants:*

All of the three interview participants graduated in 2020 and had at least one virtual SPE rotation. Each of the interview participants expressed relief in that the Clinical SPE rotation(s) were completed in person. One of the participants completed the Food Service rotation virtually, two completed the Elective rotation virtually, one completed a Long-Term Care rotation virtually, and two completed the Community rotation virtually.

#### *Hours for Virtual SPE Rotations:*

The hours devoted to virtual SPE rotations ranged from 192 – 400 for the three interview participants. Each of the interview participants tracked hours in a different method: one developed a spreadsheet to keep track of hours spent on virtual rotations, one used a spreadsheet provided by the Dietetics Program, and one did not track hours.

#### *Comfort Level w/ Patients, RDs, Employees:*

When asked about comfort level in talking to patients, and working with other RDs and/or Employees, answers differed greatly. One participant expressed complete comfort in beginning practice and stepping into a management role with 3 months of graduation. One expressed that her confidence level grew exponentially with in person rotations. This same participant expressed that some of her fellow Interns (who completed a virtual clinical rotation) did not feel comfortable beginning Dietetics practice upon graduation. The last participant expressed increased confidence after the in person clinical and food service rotations. This participant, similar to the previous one, expressed that a virtual clinical rotation would have been detrimental to her confidence level.

### *Soft Skills:*

Only one of the interview participants completed training in the soft skills totally in person. Two of the participants completed this training both virtually and in person. Both of these participants expressed completely confidence in these skills and remarked that the virtual platform helped with the use of technology and getting used to giving and receiving feedback from peers.

### *Overall Impression of Virtual SPE:*

One participant was extremely happy with the virtual SPE experience as it allowed Interns to work at his/her own pace more freely. Another participant commented that the virtual SPE rotations did allow for the completion of special projects one would not normally be allowed to be completed. This same participant also mentioned that sometimes rotations were not designed well for the virtual platform and the experience suffered. The last participant expressed that she would not recommend a completely virtual Internship Program but believes that some rotations are beneficial. These last two participants also expressed those clinical rotations should not be virtual as both believed the quality of the rotation would suffer.

The results of these surveys and interviews are not statistically significant, and there appears to be only a small effect of the virtual SPE on passing the RD exam and beginning practice in the field of Dietetics. It is interesting to note that the RD exam pass rate for the class of 2020 with some virtual SPE was slightly higher than the RD exam pass rate for the class of 2019 with no virtual SPE. Possible reasons for this slight increase will be discussed in the next chapter.



## Chapter 5: Discussion

This research study compared intern perception of the quality of preparation in virtual SPE for the RD exam and beginning practice in the field of Dietetics, and RD exam pass rate for 2019 (no virtual SPE) and 2020 (some virtual SPE). Because of the equivalency of the activities to complete these virtual rotations along with observation of and discussions with Preceptors, Interns, and employers, it was hypothesized that there would be no significant difference in the pass rate for CDR's registration examination or the graduated Interns' preparation for practice in the field of Dietetics. This mixed methods research project sought to determine if there are differences in the quality of preparation in virtual versus onsite supervised practice experience.

Interesting themes begin to emerge with regards to virtual SPE and the benefits and/or detriments to this in terms of level of comfort in beginning practice in the Dietetics field and preparation for the RD exam. Because no results were received from employers of new RDNs, we are not able to determine the perceived level of preparation to begin Dietetics practice from employers. Pass rates for the RD exam as reported by Program Directors did not seem to be affected by virtual SPE.

### *RD Exam Pass Rates & Domains:*

The results of the survey to Program Directors show an average RD exam pass rate of 85% for the class of 2019 with no virtual SPE, and an average RD exam pass rate of 88% for the class of 2020 with at least partial virtual SPE. It is interesting that the pass rate increased with some virtual SPE. This slight increase in RD exam pass rate is likely not due solely to virtual SPE. This difference in RD exam pass rates could be partially due to the Interns' increased amount of personal time while using the virtual platform. While using virtual SPE, more responsibility was

placed on the Intern or learner. As stated in Wedemeyer's Theory of Independent Learning<sup>22</sup>, this is the key to independent study. Multimedia platforms were incorporated with the use of virtual SPE which often utilized case studies, telehealth, simulations, Zoom or Webex meetings, and projects in order to meet competencies. These assignments and meetings did place the onus of learning on the Interns and allowed more time for research into specific disease states, assignments related to food service management, and community assessment. This additional research also provided Interns more study and preparation time and methods for the RD exam. The ability to complete assignments for virtual SPE anytime, anywhere during a specific rotation allowed Interns to learn at the time of day which was best for him/her instead of working a specific shift as found in onsite rotations. This played a role in the learning method but likely did not significantly affect the quality of preparation for the RD exam or beginning practice in the Dietetics field. The number of hours to complete a Dietetics program and achieve mastery of competencies was reduced by ACEND. This reduction in hours, again, may have allowed the Interns an increased amount of study and preparation time for the RD exam. Interns completing virtual assignments may have also been provided with higher acuity patients, and more comprehensive assignments in other rotations as compared to those that can be provided in the onsite setting.

Slight variances such as those seen in the mean pass rates for 2019 and 2020 reported by respondents to the Program Director survey can also be seen in the national mean RD exam pass rates.

The national RD exam pass rates for 2012 – 2021 are below:

Year	Mean Pass Rate
2012	83%
2013	85%
2014	83%
2015	85%
2016	86.5%
2017	71%
2018	71.5%
2019	69.5%
2020	68.5%
2021	66%

The mean pass rates are dramatically different beginning in 2017. As seen above, the RD exam pass rate dropped significantly from 2017 – 2021 ( $M = 69.3\%$ ) as compared to 2012 – 2016 ( $M = 85\%$ ). This decrease is likely due to the change in the Domains of the RD exam which occurred in 2017. The primary difference in these Domains exists with the increased percentage of questions coming from the Principle of Dietetics section (increase from 12% of questions to 25% of questions). Without knowing the presence or absence of virtual SPE in 2019 and 2020 for those persons taking the RD exam, it is impossible to conjecture about the influence this may have had on pass rate for those years. However, we are able to say that the slight increase in mean RD exam pass rate in 2020 reported by respondents to the Program Director survey may, in part, be due to the virtual SPE. As previously stated, this slight increase is likely not due solely to the presence of virtual SPE.

### *Benefits of Virtual SPE:*

Serving as and working with preceptors before, during, and after the COVID-19 pandemic, this researcher found that the use of the virtual platform, case studies and simulations in particular, allowed the opportunity to create or recreate rare and/or infrequent events, and clinical cases with higher acuity for the interns. For example:

- During a food service rotation, Interns were allowed to develop a plan of action to feed hospitalized patients with no use of the institution's kitchen due to a chemical spill.
- During a clinical rotation, Interns were given case studies for patients with conditions such as Munchausen's syndrome, abdominal tuberculosis, and cystic fibrosis.

This affords Interns the ability to increase skills and participate in events not normally included in traditional rotations. Lavoie and Clarke<sup>31</sup> reported that many clinicians and educators believe simulation promotes patient safety and raises the quality of patient care when used for both the basic education of nurses and continuing education purposes. Nursing clinical experience is very similar to the clinical education provided to Dietetic Interns therefore we can extrapolate that simulation and possibly case study-based education would promote increased quality of education for Dietetic Interns as well.

A question on the survey to Program Directors sought to evaluate perceived benefits of virtual SPE. Only 25% of respondents indicated no perceived benefit of the virtual SPE for Dietetic Interns. The primary advantages to virtual SPE were increased flexibility for Interns, increased knowledge (likely because of the use of simulation and case studies), and use of technology. Several Program Directors indicated that safety for Interns was increased by keeping them working from home, and that the virtual SPE allowed for less travel time for the Interns as well.

### *Quality of Preparation for the RD Exam with Virtual SPE:*

Most respondents to the Intern survey graduated in 2020 and indicated the presence of at least some virtual SPE during his/her Internship Program. Community nutrition was the rotation most frequently completed on the virtual platform.

The responses to the question regarding level of preparation for the RD exam indicated “somewhat prepared” as the most common answer. The difference in level of preparation between the graduates of 2019 with no virtual SPE as compared to the graduates of 2020 with at least partial SPE was not statistically significant, and only a small effect of the virtual SPE was seen on the level of preparation for the RD exam.

Sixty-eight percent (68%) of respondents indicated passing the RD exam on the first attempt. All of the respondents who answered as “completely prepared” to take the RD exam passed on the first attempt. Only 3 respondents indicating “somewhat prepared” failed the exam on the first attempt. None of the graduated Interns who indicated “completely unprepared” to take the RD exam passed on the first attempt. It is difficult to determine if the level of preparation for the RD exam was influenced by the percentage of virtual SPE encountered by the graduating Intern. The results of this showed 4 respondents indicating “completely prepared” for the exam with the percentage of virtual SPE ranging from 1 – 25% (1 respondent) to 51 – 75% (2 respondents) to >75% (1 respondent). The results of those indicating completely unprepared were similar with 1 respondent indicating 1 – 25% virtual SPE and 1 respondent indicating 26 – 50%. There does not seem to be a correlation between the level of preparation and percentage of virtual SPE. The responses to the question regarding failing the RD exam on the first attempt indicate no correlation between the percentage of virtual SPE, level of preparation, and the inability to pass on the first attempt.

Similar to the above results, the ability to pass the RD exam within the first year of graduation was not influenced by the percent of virtual SPE, and level of preparation. Of the 5 respondents who did not pass the RD exam within the first year of graduation, 3 indicated only 1 – 25% virtual SPE, and only 1 indicated >75% virtual SPE. Two respondents with the least amount of virtual SPE answered “somewhat prepared” for the RD exam, and the third respondent in this category indicated “completely unprepared”. There were no additional respondents answering “completely unprepared” for the RD exam.

#### *Quality of Preparation for Dietetics practice with Virtual SPE:*

The last question on the graduated Intern survey sought to gather the graduated Interns’ level of preparation to begin practice in the field of Dietetics. The majority of respondents graduated in 2020 and indicated at least some virtual SPE during the Internship Program with the majority utilizing the virtual SPE platform for 1 – 25% of rotations. Similar to the percentage of virtual SPE, level of preparation and passing the RD exam on the first attempt or within the first year of graduation, the results of this question indicate no influence between percentage of virtual SPE, specific rotation completed on the virtual platform, and level of preparation to begin practice in the field of Dietetics. This could, in part, be related to the equivalency of assignments provided with the virtual SPE as compared to the onsite SPE. The time on task spent utilizing the virtual platform was likely similar to the onsite time, as well. As stated in the RIT<sup>32</sup> course design module, the total time spent on virtual tasks should be roughly equal to comparable tasks in classroom (onsite) setting. In addition, the breadth and depth of virtual SPE assignments was likely greater as compared to those utilized in the onsite setting. This has been the case in my own practice. By offering a virtual rotation, Interns are able to assess patients not normally seen

in the hospital setting. These Interns are able to work on case studies of patients with more rare diseases/conditions and are able to research these conditions in order to develop a plan of care. In addition, food service assignments were developed which afforded personal benefits to students with regards to their home kitchens. For example, students completed a waste study in their home which allowed for better management of resources.

#### *Interviews with Graduated Interns:*

During this research project, only 3 of the graduated Interns agreed to participate in an interview. Each of these interviews were conducted via Zoom. Transcripts were created, reviewed by the researcher and another RD who served as a Preceptor during the COVID-19 pandemic, and provided both in person and virtual rotations for Dietetic Interns. Memos, codes, and themes were identified after review of these transcripts.

All interviewees graduated in 2020 and completed at least one virtual rotation. Unfortunately, no graduates from the class of 2019 with no virtual SPE agreed to participate in an interview. Similar to the ACEND Program Director survey, and graduated Intern survey, interviewees indicated that the Community, Food Service, Long Term Care, and Elective or Specialty rotations were most often completed virtually. All expressed relief in that the Clinical rotation was completed in person. All graduated Intern interviewees were working in a clinical setting. One also has food service and managerial duties in addition to her clinical responsibilities.

All interviewees passed the RD exam on the first attempt, and all expressed complete preparation to take this examination. When asked the question regarding comfort level in working with other RDs, patients, and employees, the answers varied. The interviewee who is working in a managerial role, expressed complete comfort in working with all groups discussed.

This interviewee also admitted to having a great deal of food service experience prior to beginning her internship therefore she felt that her comfort level was partially due to that prior knowledge. The other two interviewees expressed the level of comfort with other RDs and patients expanding tremendously during in person rotations. Both felt that a virtual clinical rotation would have been detrimental to her confidence level. In fact, one of the interviewees commented that some of her fellow interns who experienced a virtual clinical rotation did not feel comfortable beginning Dietetics practice upon graduation.

Only 1 interviewee was provided training on soft skills exclusively in person. The other two were provided this training both in person and virtually. All expressed a high comfort level with these skills. The two graduated Interns who received training on the two different platforms expressed that their comfort level with technology and giving/receiving feedback to and from peers was increased.

The overall impression of the virtual SPE was primarily positive from all interviewees. One expressed complete happiness as Interns were allowed to complete projects more freely and had more personal time. Another interviewee remarked that the virtual SPE did allow for the completion of special projects not normally available with in person rotations. Two of the graduated Interns did express that a completely virtual SPE experience or a completely virtual Clinical rotation would not be beneficial and may be detrimental to the quality of the experience and/or rotation.

Benefits to the virtual SPE experience were seen by both Program Directors and graduated Interns. In addition, it appears that there was minimal difference in the manner in which training on soft skills was addressed, and minimal difference in the comfort level of the graduated Interns with these skills. Review of the results of these surveys and interviews confirms the small effect



of the virtual SPE on comfort level with taking the RD exam and beginning practice in the Dietetics field. The expression of the graduated Intern interviewees regarding increased free time for Interns and the ability to complete special projects may begin to confirm the speculation that this is one of the reasons the RD exam pass rate increased slightly in 2020 by Interns who completed virtual SPE rotations.

### Conclusion:

The COVID-19 pandemic necessitated the quick conversion to online learning and virtual SPE by Dietetic Interns. To assist in the accommodation of this, ACEND decreased the required total number of SPE hours from 1,200 to 1,000 and increased the hours allowed from alternate practice experience (case studies, role playing, and simulations) from 300 to 600. These changes allowed Interns to meet competencies without being onsite in acute care facilities, schools, community organizations, food service operations, and/or long-term care facilities. Navigating this fast conversion was difficult for Program Directors, Preceptors, and Interns but has become common in practice today. Virtual learning and SPE is likely to continue far into the future in the field of Dietetics and other medical professions as well<sup>5</sup>.

Results from this study may start to show potential benefits of virtual learning to Dietetics Program graduates. Perraton's<sup>22</sup> Distance Education theory of 1988 states that effective distance education teaching/learning should ensure that students/learners undertake frequent and regular activities over and above reading, watching, or listening. These more in-depth activities occurred with Dietetic Interns during the pandemic with the completion of telehealth patient visits, virtual food service assignments, simulations, case studies, and community assessments. In further support of distance learning for Dietetic Interns, Holmberg put forth the idea that

distance education provides promotes professional and occupational training.<sup>22</sup> Results from interviews with 3 Dietetic Program graduates showed a high level of preparation for beginning practice in the Dietetics field after the completion of virtual SPE. This may, in part, be due to the type of supervised practice experience completed virtually in combination with the job obtained after graduation.

These results may also begin to point to the equivalency of virtual learning to onsite learning. Because the learning environments are different, virtual learning cannot be equal to onsite learning but these can be equivalent. The equivalency of virtual SPE to onsite SPE can be seen in ACEND's Standard 6.3c which states that programs must ensure comparability of experience when different learning methods are used.<sup>3</sup> ACEND did not specifically stipulate what these alternate practice experiences should entail but stated that these must be professional, real-life experiences. During the rapid conversion of supervised practice for Dietetic Interns, Program Directors were able to develop and implement many different virtual learning opportunities. Case studies, simulations, role-playing via Zoom or Webex meetings, food service assignments based on one's home kitchen vs. an institutional kitchen, and detailed community assessments are just a few of the examples of the experiences for these Interns. While these were completed in a different learning environment, Interns continued to receive feedback from Preceptors, and were able to meet all ACEND competencies in order to graduate from his/her Dietetics Program. The equivalency of these assignments and experiences is important, as virtual learning is not likely to go away any time in the near future. We have become accustomed to this type of learning. In addition, some Dietetics Programs have lost sites for supervised practice and continue to complete certain rotations virtually. A new normal using multiple media platforms, and a variety of learning experiences has been created in the field of Dietetics education. As

professionals, we have been able to expand our knowledge, employ additional research of many topics, and have become more innovative with assignments and experiences for Interns.

While certain benefits may begin to emerge from this small study, there were limitations which affect the reliability of the information obtained. The primary limitation to this study was the dismal number of responses received from all surveys and lack of participants for the interviews. During casual conversations with both Program Directors and recently graduated Interns, the primary comments received when asked why more surveys were not returned were:

- Program Directors: “We are too busy with COVID protocols and keeping everyone safe, as well as, putting together virtual experiences for our Interns.”
- Graduated Interns: “We are really busy with studying for the RD exam and starting our career.” “Also, I don’t think research is important.”

The inability to gather data from Employers regarding the level of preparation for beginning practice in the field of Dietetics by those graduated Interns from the classes of 2019 with no virtual SPE and 2020 with some virtual SPE was disappointing. The graduated Interns’ lack of agreement in sending these surveys to his/her first employer begs the question as to “why”. Were these new RD employees apprehensive about the answers to these questions? Did these new RD employees feel that perhaps the employer did not feel an adequate amount of preparation from this graduated Intern? More research is needed in this area in order to determine the level of preparation for beginning practice in the field of Dietetics by those Interns who experienced virtual SPE.

While the results of this research are not statistically significant, we may begin to see a trend in the effect of virtual SPE on the comfort level of taking the RD exam and beginning practice in the Dietetics field. Again, more research is needed, especially from graduated Interns, in order

to determine if there is a positive or negative effect of the virtual SPE on these factors. In addition, determining the specific effect of the virtual SPE is of primary importance. Is the Intern afforded increased study time for the RD exam which leads to higher pass rates? Is the Intern provided with patients of higher acuity, or more in-depth assignments in the food service and community rotations leading to increased knowledge not normally acquired by Dietetic Interns? These are questions which could be asked upon further research with this group.

The altered number of hours for completion of a Dietetics Programs and those allowed for alternate practice experience continues until midyear 2022. Many Dietetics Programs continue to provide virtual SPE rotations for Interns, and plan to continue the offering of these virtual options in the future. The results from this current research seem to reflect positively on this virtual SPE but more research is needed before we can conclusively say that this virtual SPE is beneficial to graduating Interns regarding taking the RD exam and beginning practice in the field of Dietetics. In addition, in order to determine the true benefits of this virtual SPE, graduated Interns who experienced some virtual SPE from the classes of 2021 and 2022 should be surveyed regarding their level of preparation for the RD exam and Dietetics practice. Further research may provide the opportunity for the development of virtual Dietetics Programs which may increase enrollment numbers, increase the diversity of, and allow for more specialization in specific areas of the Dietetics field.

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## Appendices

Table 1: Equivalency Theory & Dietetics

Theory Construct	Description	Examples from Dietetics
Equivalency	Local and distance learners have fundamentally different environments in which to learn.	<p><b>Clinical:</b> Dietetic Interns completed video patient visits instead of a face-to-face onsite visit with a hospitalized patient.</p> <p><b>Food Service:</b> Dietetic Interns planned a Dinner party for 12 people instead of planning a Theme Meal for a healthcare facility.</p>
Learning Experience	Anything that happens to the student to promote learning. Some learners require more observing while others require more doing.	<p><b>Observation:</b> Attending virtual patient care rounds</p> <p><b>Doing:</b> Completing a community assessment for an assigned section of the Interns' locale</p>
Appropriate Applications	Learning experiences should be suitable to the needs of the individual learner.	<p>Dietetic Interns require different types of assignments:</p> <p><b>Clinical:</b> Some performed well with video patient visits while others required real life case studies to excel in the clinical setting.</p> <p><b>Food Service:</b> Instead of completing a Plate Waste study for a large facility, waste measured using an assignment from the Interns' own household</p>
Students	Those involved in the formal, institutional based learning activities.	Dietetic Interns completing the Supervised practice experience component of the Dietetic Internship program.
Outcomes	Obvious, measurable, and significant changes which occur as a result of learning.	<p>Completion of the Internship program</p> <p>Sitting for CDR's Registration examination</p>



Table 2

Intern Survey:

Please complete the following questions based on your Internship, Coordinated Program, or ISPPi experience.

1. In which year did you graduate? (Choices: 2019 or 2020)
2. Was any of your Supervised Practice Experience (SPE) virtual? (Choices: Yes or No)
3. If any of your SPE was virtual, what percentage?
  - A. 1-25%
  - B. 26-50%
  - C. 51-75%
  - D. > 75%
4. Which rotations of the SPE were virtual? (Choices: Clinical, Food Service, Community, Outpatient, Other \_\_\_\_\_)
5. How prepared did you feel to take the RD Examination? (Likert Scale)
  - 1 = Not prepared at all
  - 2 = Somewhat unprepared
  - 3 = Neither prepared or unprepared
  - 4 = Somewhat prepared
  - 5 = Completely prepared
6. Did you pass the RD examination on the first attempt? (Choices: Yes or No. If answer is No, the follow up question will be: Did you pass the RD examination in the first year of graduation)
7. How prepared did you feel to begin working in the field of Dietetics? (Likert Scale)
  - 1 = Not prepared at all
  - 2 = Somewhat unprepared
  - 3 = Neither prepared or unprepared
  - 4 = Somewhat prepared
  - 5 = Completely prepared
8. Would you be willing to participate in a short interview regarding your experience with the SPE? If so, please include your name and email address.
9. Would you be willing to send a survey to your first Employer (after graduation) regarding your level of preparation to practice Dietetics? If so, please include your name and email address.

Table 3

Employer Survey:

Please complete the following questions based on the graduated Intern that you hired in 2019 or 2020.

1. From which Dietetics Program did your newly hired Dietitian graduate?
2. In what year did you hire this Dietitian?
3. Which area of Dietetics practice was this person hired into with your organization?  
(Choices: Clinical, Food Service, Community, Outpatient, Other)

Clinical Questions:

- How prepared was this person to locate information in the Medical Record?
- How prepared was this person to write patient care notes according to the NCP?
- How prepared was this person to provide nutrition education to patients?

Food Service Questions:

- How prepared was this person to practice Servsafe guidelines?
- How prepared was this person in working with different meal delivery systems?
- How prepared was this person with Diet Office/Call Center procedures?

Community Questions:

- How prepared was this person to locate information in the Medical Record?
- How prepared was this person to perform a community assessment?
- How prepared was this person to provide nutrition education to patients?

Outpatient Questions:

- How prepared was this person to locate information in the Medical Record?
- How prepared was this person to write patient care notes according to the NCP?
- How prepared was this person to provide nutrition education to patients?

All Questions will use the following Likert Scale:

- 1 = Not prepared at all
- 2 = Somewhat unprepared
- 3 = Neither prepared or unprepared
- 4 = Somewhat prepared
- 5 = Completely prepared

4. Was the Supervised Practice Experience for that newly hired graduated Intern virtual or face to face?
5. Do you have any information to add about this newly hired graduated Intern?
6. Would you be willing to participate in a short interview regarding your experience with the quality of preparation for Dietetics practice for this newly hired graduated Intern? If so, please include your name and email address.

Table 4: Program Director Survey

1. Were any of the Supervised Practice experiences/rotations completed virtually by Interns graduating in 2019 or 2020? If no, please skip to Question # 3
2. How were virtual hours tracked?
3. What was the RD Examination pass rate for your Program in 2019?
4. What was the RD Examination pass rate for your Program in 2020?
5. With the decrease in ACEND required hours, did the domains of your Program change? If so, how?
6. What did you change in order to virtually meet ACEND standards?
7. How were the following soft skills (Teamwork, Ethical conduct, Initiative, Flexibility, Self-Confidence, Communication, Empathy/Compassion) addressed and/or taught to Interns graduating in 2019 and 2020? Were these taught differently during virtual rotations?
8. Did you find any advantages to the virtual supervised practice experience? If so, what were these advantages?

Table 5: Intern Interview Guide

1. Which rotations, if any did you complete virtually in 2019 or 2020?
2. How many hours did you devote to this/these rotations?
3. How were the virtual hours tracked?
4. Did you feel that the virtual experiences trained you to practice as an entry level Dietitian in terms of Clinical, Food Service, Community, and/or Outpatient nutrition knowledge?
5. How were the following soft skills (Teamwork, Ethical conduct, Initiative, Flexibility, Self-Confidence, Communication, Empathy/Compassion) addressed and/or taught in your Dietetics education program?
6. What was your comfort level in talking face to face with patients, working with Food Service employees, and/or other Dietitians?
7. How were your chart notes reviewed and/or assignments/activities graded?
8. What is your overall perception of the virtual/remote supervised practice rotations that you completed?

Table 6

Employer Interview Guide:

1. In what year did you hire a newly graduated Intern?
2. Have you hired a graduated Intern from this Program before?
3. Do you know if any of the Interns SPE was virtual? If so, how much and which specific rotations were virtual?
4. Which area of Dietetics was this Intern hired to work in with your organization?
5. Overall, how prepared was this graduated Intern to practice in the field of Dietetics?
6. Do you feel that the virtual experiences trained this graduated Intern to practice as an entry level Dietitian in terms of Clinical, Food Service, Community, and/or Outpatient nutrition knowledge (depending on which area the new Dietitian will work in)?
7. Do you feel that the graduated Intern was trained sufficiently in the following soft skills (Teamwork, Ethical conduct, Initiative, Flexibility, Self-Confidence, Communication, Empathy/Compassion)? Why or why not?
8. What was the graduated Intern's comfort level in talking face to face with patients, working with Food Service employees, and/or other Dietitians?
9. If you previously hired an Intern from this Program, how did this Intern's preparation for practice compare to others?

Table 7 Addressing Soft Skills (Teamwork, Ethical conduct, Initiative, Flexibility, Self-confidence, Communication, Empathy/Compassion) with the Equivalency Theory

<b>Theory Construct</b>	<b>Research Question</b>	<b>Indicators</b>
Equivalency	Question #7 on the Program Director survey – How were soft skills taught to Inters who graduated in 2019 or 2020?	Specific activities planned to teach these skills in the face to face, and virtual environments
Learning Experience	Question #5 on Intern Interview guide – How were soft skills taught in the Dietetics education Program?  Question #6 on Intern Interview guide – What is your comfort level in talking with patients, working with other RDs and/or Food Service employees?	Which specific activities did the Intern participate in that were beneficial in teaching these skills?  Is the graduated Intern able to comfortably talk face to face with patients, act as a Team player, and work with other employees?
Appropriate Application	Question #6 on the Program Director survey – What was changed to virtually meet the ACEND standards?  Question #7 on the Program Director survey – How were soft skills taught to Interns who graduated in 2019 or 2020?	Specific activities planned to teach these soft skills in the virtual environment.  Specific rotations in which these soft skills were addressed. How was competency measured?
Students	Question #5 on the Intern Interview guide – How were soft skills taught in the Dietetics education Program?	Which specific activities did the Intern participate in that were beneficial in teaching these skills?
Outcomes	Question #4 on the Intern Interview guide – Do you feel that the virtual experience trained you to practice as an entry level Dietitian?  Question #6 on the Intern Interview guide - What is your comfort level in talking with patients, working with other RDs and/or Food Service employees?  Question #5 on the Employer Interview guide – What is the overall preparedness level of the newly hired Dietitian?  Question #7 on the Employer Interview guide – Was the graduated Intern trained sufficiently in these soft skills?  Question #8 on the Employer Interview guide - What is the comfort level of the newly hired Dietitian in talking with patients, working with other RDs and/or Food Service employees?	Newly hired graduated Intern ability to achieve competency in first job after graduation.  Newly hired Dietitian able to perform satisfactorily on competencies of the job in which he/she hired.  Newly hired Dietitian may be observed talking with patients and interacting with coworkers.