Educating the Educators: Competency-Based Instructional Physician Assistant Faculty Development through the Use of Online Learning Modules

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In contrast to principal Physician Assistant (PA) program faculty, clinically practicing PAs are not provided adequate preparation to function effectively as instructional faculty in PA programs. This improvement science-based dissertation in practice examined the usefulness of online instructional modules designed to orient clinically practicing PAs to their role of instructional faculty. Inquiry included the effectiveness of the modules in improving the participants' content knowledge, the efficacy of the online format as an instructional method, and the participants' perceptions of the module delivery method and the content contained within. Quantitative and qualitative analysis of data collected from departmental PA instructional faculty determined the online modules to be effective in all areas and uncovered themes that revealed the strengths of the modules and opportunities for improvement for the next iteration of the Plan-Do-Study-Act cycle. Future work will include expansion of the module content in the areas of diversity, equity, and inclusion as well as recognition and mitigation of provider burnout. After expansion, the modules will be deployed in within our place of practice.

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Authors' Note

Dan Lavage provided free consulting service as part of the statistical consulting center in the Department of Statistics in the Kenneth P. Dietrich School of Arts and Sciences.

1.0 Naming & Framing the Problem of Practice

1.1 Problem Area

1.1.1 Terms and Definitions

For readers who may be unfamiliar with Physician Assistants and/or Physician Assistant education, we have provided the following terms and definitions.

Physician Assistant (PA) – "PAs are medical professionals who diagnose illness, develop and manage treatment plans, prescribe medications, and often serve as a patient's principal healthcare provider" (AAPA, 2020). PAs work in all medical and surgical specialties in every state in the country.

Principal Faculty - Full time faculty members in a PA program of study, who are responsible for curricular planning, teaching, scholarly activity, service, and program self-assessment. By accreditation standards, they are also responsible for orienting and mentoring instructional faculty. They hold formal appointments within their institution.

Instructional PA Faculty (IPAF) - Faculty members in a PA program of study who are "qualified through academic preparation and/or experience to teach assigned subjects and knowledgeable in course content and effective in teaching assigned subjects" (Accreditation Standards, 2018). These faculty members may teach as little as one lecture, or as much as an entire course. They may hold no appointment at the institution, a clinical appointment, or an adjunct appointment. These faculty members are often full-time

practicing professionals who have expertise in a particular subject area or medical specialty.

Adjunct Faculty – this term will be used at times during this document, most commonly in the Review of Supporting Knowledge section. Other professional programs use the term adjunct faculty in the same way the PA profession uses the term instructional faculty. When referring to PA education the term instructional faculty will be used, and when referring to other professional education programs the term adjunct faculty will be used. The terms can generally be used interchangeably.

1.1.2 Education and Training of PAs

The Physician Assistant (PA) profession is only 51-years old. It was initially developed as a program to bridge the skills of Navy corpsmen to help alleviate a shortage of primary care physicians. The profession was later expanded to civilians by offering a stand-alone certification, sometimes awarded by community colleges, before adopting the master's degree requirement it now has. One local example of community college training for PAs is the Community College of Allegheny County (CCAC). In the 1960s, The Health Systems Agency of Southwestern Pennsylvania was created. In the 1970s, the Agency assumed the role of disbursing federal grant money intended to improve health care service, delivery, and infrastructure in the region ("Historic Pittsburgh," n.d.). One of the grants this organization coordinated supported the inception of the Physician Assistant Program at CCAC in the late 1970s ("Historic Pittsburgh," n.d.).

Although nearly every PA program now offers a master's degree, all programs were required to do so by the end of 2020. Even though PAs are trained at the graduate level, the nature of PA education is such that PA students do not experience higher education in the same way other

graduate students might. PA education is cohort-based and accelerated generally with two different models of preparation. The first is what is commonly referred to as a traditional, 3-2 program. In this type of program, a student takes general university coursework for the first three years combined with prerequisites for the PA program, often completing the requirements for a bachelor's degree in this time frame. The student then transitions into a 2-year intensive graduate program resulting in a Master of Science (or similar) degree. Once the student enters the last two years of the program, they are essentially isolated from the rest of the university. The second type of program is a master's only program. In this model, the student has already earned a bachelor's degree and applies for entry directly into the 2-year intensive graduate program. Students who take this path may have had the opportunity to do research during their undergraduate years; something the students from traditional 3-2 programs generally have not had the time or opportunity to do.

During the first graduate year, known as the *didactic* year, students may have 40 hours of direct instruction per week either in the classroom, laboratory, or clinical setting. Additionally, PA students commonly have multiple assessments each week requiring a few to several hours of reading and studying per night. This schedule leaves little, if any, time to pursue research or teaching interests. During the second graduate year, known as the *clinical* year, students rotate through a variety of clinical settings. The PA program at Pitt requires students to complete a minimum of 200 hours in each of nine medical specialty areas. These hours are completed in 5-week blocks of time with call-back days at the end of each block for testing. Students may be placed in rural, suburban, or urban settings for their rotations. During these rotations students may have some opportunity to observe, or minimally participate, in clinical research if they have a rotation in an academic medical center. However, with such a short duration of time in each specialty area, it is not possible to have significant exposure to teaching.

As a result, the lack of exposure to research and teaching during their education may put PAs at a disadvantage in the future if they want to do clinical research or if they choose to take an academic position in which research is required. Cawley and Dehn (2017) summarize the scholarship of PAs throughout the 50 years of the profession's existence. Although limited in volume, the existing literature published by PAs is broad in its themes and rich with innovation (Cawley & Dehn, 2017). The authors propose future directions for research such as the need for PA educators to become proficient in scholarship to sustain and grow in faculty positions as well as the discussion of doctoral degrees for those who exist in a profession in which the master's degree is considered terminal (Cawley & Dehn, 2017).

1.1.3 Program Position Within Institutions

The majority of PA faculty exist as master's degree-trained individuals in a world of PhDs. The ability to diagnose disease, prescribe treatment, and perform surgeries and invasive procedures does not guarantee any level of esteem in the world of higher education – particularly outside of a medical school. The PA profession itself, however, has grown substantially over the last half century in prestige, in educational methodology, and in scope of practice. Recently, the profession has approached a new frontier of growth. The U.S. Bureau of Labor Statistics projects a 37% growth rate from 2016 to 2026, which is far above the 7% average for all occupations (Bureau of Labor Statistics, 2018).

A proliferation of new PA training programs has also happened over the past several years. According to the ARC-PA (2018), the accrediting body for PA educational programs, there are currently 235 fully accredited programs in the U.S. With 67 programs in the provisional stages, and an estimated 57 new programs entering the accreditation arena, the total number of PA

programs may potentially increase nationwide by approximately 50% within the next three years (ARC-PA, 2018).

Within individual institutions of higher education, PA programs can be housed within a school of medicine, allied health, or nursing. Because of this variety of location within the organizational structure, not all PAs are trained in academic medical centers like medical physicians are. Therefore, PAs often have less exposure to traditional graduate medical education training.

As an academic unit within the university, PA programs are sometimes located within a stand-alone department or sometimes exist as a program within a department which may or may not be similar to the PA program's mission, vision, or even area of study. For example, one local university's PA program is located in the Department of Biology, with Biology faculty as department leadership, overseeing and governing the leadership of the PA program. Situations such as this significantly reduce the PA program's representation and ability to advocate for their needs. Such situations can even stunt the growth and development of a program, thereby keeping it in a "second-class" position in terms of power and resources.

Finally, PA programs mean different things to different institutions of higher education. The perceived value of a PA program to a small college may be vastly different from how a large, research institution values the contributions of a PA program. For a small institution, PA programs could be a flagship educational offering that would bring in significant income. For a large, research-intensive institution, a PA program is unlikely to generate considerable research funding. In the case of the small institution, the PA program may be valued only for its income-generating potential. This decision would not be acceptable as the sole reason for an institution to develop a PA program. For example, the accreditation body for PA programs could cite an institution for

exploiting a PA program for its ability to generate revenue for the institution (Accreditation Standards, 2018).

1.1.4 PA Faculty Job Satisfaction

Might the education and training of PAs or a PA program's position within an institution affect PA faculty job satisfaction? Research from the Physician Assistant Education Association surrounding PA faculty job satisfaction has produced to some emerging findings regarding this question. In PA education circles, an anecdotal perception exists that suggests PA faculty tend to re-patriate themselves back into clinical practice after spending some time in academia. This idea warrants further study, as some evidence suggests, to support it. For example, in the last two years, 44% of PA faculty considered leaving academia for a different clinical position, 35% considered leaving their current institution for a different institution, and 45% received at least one firm job offer elsewhere (PAEA, 2018). PA faculty members report they have been in their position for a mean of four years, and a median of 2.5 years (PAEA, 2018). Among all faculty members surveyed roughly 75% state their most recent position before entering higher education was clinical practice (PAEA, 2018). These data points suggest a significant number of PA faculty do not have a lot of experience in higher education, and the possibility of attrition is very real.

Existing and new programs will need a large number of trained and experienced PA educators. The ARC-PA has already stated this as a concern. In the most recent *Notes to Programs* communication the ARC-PA (2018) states, "The ability of current and emerging programs to recruit qualified program leadership and faculty also remains worrisome to the commission" (p.6). From a faculty perspective, those who are experienced will likely have the ability to shift from an existing to a new program (Coniglio, 2015). For those PA programs that desire to keep, or build,

a high-quality program and advance the standing of the profession in general, as well as within their own institutions, faculty satisfaction and retention becomes more critical.

Further investigation into job satisfaction of PA faculty reveals some interesting findings. PA faculty defined the following items as the "least satisfying" aspects of their job: fairness of salary related to other faculty; institutional leadership; research opportunities; salary amount; tenure requirements (PAEA, 2018). When considering the salary concerns it is not clear, however, if the faculty surveyed are dissatisfied with their salary as compared to other PA faculty or as compared to other faculty within the institution. A clear and significant disparity exists between the median salary of a clinically practicing PA, currently $104,860, and that of a PA educator, currently $93,000 (Bureau of Labor Statistics, 2018; PAEA, 2018).

In higher education, salary is commensurate with faculty rank. Approximately 61% of PA faculty have a rank at the level of instructor (PAEA, 2018). Not only does the instructor rank indicate a lower salary, but also indicates faculty have not been promoted due to the lack of either teaching, research, or service that could lead to promotion. Because salary is often tied to promotion, and PA faculty cite dissatisfaction with the opportunities for research, their salaries may lag behind those of other faculty in the institution of higher education. These facts illuminate a plausible link to the other areas of job dissatisfaction such as institutional support and research opportunities.

In *Building a Research Culture in Physician Assistant Education*, Ritsema and Cawley (2014) outline barriers to research for PA educators as well as voice their recommendations to faculty and institutional administrators for improvement. Common barriers cited include lack of training in the actual process of research, lack of institutional support in terms of funding and protected time, and limited availability of external funding for PA research (Ritsema & Cawley,

2014). The clinical side of the profession is on the cusp of potential change as well with the introduction of Optimal Team Practice (OTP) which could revolutionize the way PAs practice clinically. Skilled researchers and scholars will be needed to help navigate this potentially seismic change (Cawley & Dehn, 2017).

A specific educational program to train clinically-practicing PAs to become PA educators does not currently exist, and teaching is not a part of graduate PA curricula, thus, PAs who become faculty members are transitioning to that role from full-time clinical practice. The methods of education and training of PAs, the variety of locations of PA programs within institutions of higher education, the rapid growth in the number of PA programs, and concerns regarding job satisfaction, all support the claim that clinically practicing PAs are not adequately prepared to enter higher education as faculty members.

1.1.5 Current Faculty Development Initiatives in Other Institutions

1.1.5.1 Duke University Teaching Fellowship

Improving faculty development for PA educators is not an entirely new concept. Some research exists regarding mentorship of new PA faculty as a way to provide support and help develop them as educators and scholars. This concept is of strategic importance to each university and the profession as a whole. A study focusing on mentorship of new PA educators was published by Hills and Dieter in 2010. Their study outlined a fellowship offered by Duke University for new PA educators. Duke University is significant in that it was the first institution to train PAs in the U.S. and is highly regarded among those in PA education.

PA educators entering the Duke fellowship were not officially principal faculty in the PA program, but rather they were hired at 1.0 FTE and engaged in faculty development training and

provided clinical services as a PA (Hills & Dieter, 2010). After completing this highly specific and structured fellowship, many participants entered academia full-time and tended to stay in higher education longer than the average PA educator (Hills & Dieter, 2010). This program showed promise, but obvious limitations such as funding to support the fellow's stipend, and the need to have senior faculty who can mentor the PA fellows, exist.

1.1.5.2 Physician Assistant Education Association (PAEA) Mentorship Program

In 2009, the PAEA developed a mentorship program to support the development of junior faculty by connecting them with experienced mentors. The program outcomes were studied to determine if the junior faculty had increased confidence in doing research and if they were more productive as researchers and scholars due to the program. The sample size was small, with only 17 mentor/mentee pairs in the program. Of the 17, only seven actually interacted with their mentors. Not surprisingly, the endeavor was not successful. Post-program survey data found lack of time to be one of the factors impacting participation. Also, 9% of the junior faculty actually left PA education all together during the time of this year-long program (Hegmann, 2012). These were faculty who were interested enough in scholarly work to apply to this voluntary program, and had the support of mentors, and yet they still left PA education. The results of this project suggest that the mentorship model, even among a group of motivated PA educators, was not enough to keep these educators from leaving academia and returning to clinical practice.

1.1.6 Competencies for the PA Educator

In October of 2018, the PAEA released a report detailing a list of competencies for the PA educator profession. The task force that developed the competencies described them as a way to

"help codify the essential knowledge, skills, attitudes, and behaviors faculty need to be successful in their academic roles" (Zaweski, Melcher, Sedrack, Von, & Fletcher, 2018, p. 1). The competencies are divided into *foundational* domains (Teaching, Learner-Centeredness, Interprofessional and Communication Skills, Professionalism and Role-Modeling) and *functional* domains (Program and Curriculum Design and Implementation, Program Evaluation, Scholarship Development, Leadership, Mentorship) (Zaweski, et al., 2018). Because these competencies have been released fairly recently, it is unclear what type of an impact they may have on PA educators, or even how they might be implemented by programs and faculty.

1.1.7 Basic Faculty Skills Workshops

The Basic Faculty Skills Workshop is offered by PAEA in the spring and fall of each year in alternating cities as a means to prepare new faculty who are transitioning from clinical practice to academia. This two-day intensive session covers everything from an overview of accreditation standards, to how to write high quality exam questions, to an introduction to scholarly work. The workshop also provides an opportunity for new educators to network with others from across the country. The University of Pittsburgh PA program requires new principal faculty to attend this workshop as an introduction to their role.

1.1.8 Faculty Development Workshops

In addition to the Basic Faculty Skills workshops, PAEA also hosts a variety of two to three-day, in-person, faculty development workshops twice per year. At the University of Pittsburgh, the PA program encourages and supports principal faculty who choose to participate

in these workshops, not only by funding travel, but also by allowing flexibility with scheduling and time to attend them. The faculty development workshops generally have a dedicated focus and are intended for early, mid, or late-career educators. Experts from a variety of fields teach sessions based on their area of expertise. For example, one recent session focused on best practices in student remediation. Generally, these workshops are well-attended and seats often fill quickly, sometimes even resulting in a waiting list.

1.1.9 Conference Attendance

The University of Pittsburgh also supports conference attendance for principal faculty. At the state PA conference, faculty can attend to gain continuing medical education credits required to keep their state license, participate as conference faculty, or participate by presenting scholarly work. At the national conference for PA educators, faculty can attend educational sessions, participate as conference faculty, or present scholarly work. These opportunities have always been encouraged and supported by our program.

1.1.10 Additional Formal Education

Some faculty have chosen to pursue additional formal education such as an education doctorate (EdD). The PA program and the School of Health and Rehabilitation Sciences at the University of Pittsburgh has supported faculty in this endeavor, not only through the application process, but even as a few faculty members are simultaneously progressing through the program. The EdD has provided a common language for those faculty members in leadership positions in

the program. The goal is to promote leadership development and produce change agents capable of leading the program, and ultimately, the profession.

1.1.11 Instructional Faculty Development

New instructional faculty and new principal faculty have shared backgrounds with both entering academia from full-time clinical practice. Both types of faculty encounter similar challenges when they start teaching in PA programs. Additionally, at our institution, both groups of faculty are held to the same performance standards in terms of teaching evaluations, course development and instruction, and student and program expectations. Unfortunately, however, instructional and principal faculty do not have similar opportunities for professional development.

At a minimum, accreditation standards require programs to orient and collaborate with new instructional faculty. Each PA program can determine specifically how these activities take place in their organization. In the PA program at the University of Pittsburgh, no formal protocol for this orientation and collaboration exists. Rather, each principal faculty member holds this responsibility for all instructional faculty who teach in their course, but the orientation and collaboration are not a standardized process. At the time of accreditation self-assessment, programs must report provide data regarding instructional faculty teaching effectiveness. At least one data point in this report must include the students' perception of instructional faculty teaching effectiveness. When completing the self-study document for the most recent accreditation visit, the only faculty members who were below benchmark for teaching effectiveness were instructional faculty members. This fact suggests instructional faculty development is a problem within the organization.

1.2 Organizational System

Our organization is the University of Pittsburgh Physician Assistant Studies Department. Our roles in the PA studies program are that of Program Director (PD) and Director of Didactic Education (DDE). The PD is responsible for effective leadership and continuous programmatic review and analysis. The DDE is responsible for designing, overseeing, and assessing our didactic (first graduate year) curriculum. The didactic year is the year in which we most heavily use instructional faculty to deliver curricular content in the classroom setting.

The history of the PA studies program itself is relatively short, having only begun ten years ago at the University of Pittsburgh. All members of the current primary leadership team in the program were also new to PA education when the program was founded having left full-time clinical practice to accept academic appointments. We are now all experienced faculty members. Over the last year there have been significant changes in the program with a transition to new leadership – including a new program director, the addition of three new faculty members, and three new staff members – including a new program administrator. We have also, recently, progressed from program to department status within the university. This achievement was important to elevate our organization to the level of participation and decision-making power in the school and university. Having a department designation is essential to our ability to have agency and to progress in our work.

With new leadership, and enhanced status in the university, the University of Pittsburgh PA program is set up to facilitate work on this Problem of Practice (POP). The leadership team now has clearly delineated responsibilities and the power to direct the work within each of their areas of oversight. A strong sense of mutual respect and support exist among the leadership team. These conditions align to provide acceptance of the overarching goals of change work. In our roles,

we are able affect change because this problem is within our sphere of influence. We are also adequately staffed from an administrative support standpoint, and our administrative staff are motivated and engaged.

Although the leadership team is in favor of change work and improvement, the rest of the faculty on the team may not be. We have a few new faculty members who may not yet have the skill set to orient and support instructional faculty. Additionally, some of our more experienced faculty members may be complacent with the way they are currently performing their job duties. We have noticed this tendency when trying to make small changes regarding how we work collaboratively with instructional faculty including reluctance and lack of follow through, although not overt noncompliance.

As we consider our organizational structure and function, we feel rather optimistic about improving the problem of clinically practicing PAs not being adequately prepared to function effectively as instructional faculty in PA programs. We are fortunate to be surrounded by bright, motivated colleagues who truly want to do the best they can for our students. We are well-positioned in our roles to affect change, and we are fortunate to have support from others on the leadership team. There may be a natural resistance to some aspects of change, but we feel ready to provide motivation and direction to overcome these challenges.

1.3 Stakeholders

1.3.1 Accrediting Body

The ARC-PA is the accrediting body for physician assistant programs in the United States. Two of their accreditation standards apply to this problem of practice. Each standard is accompanied by an annotation designed to provide the educational program with a better understanding of the intent and intended operationalization for the standard; they are not optional or merely suggestions (ARC-PA, 2018). The two relevant ARC-PA accreditation standards and the accompanying annotations are:

> ARC-PA Standard B1.10: The program should orient instructional faculty to the specific learning outcomes it requires of students.
>
> ANNOTATION: Program and principal faculty need to work collaboratively with instructional faculty in designing courses with appropriate learning outcomes and student assessment tools that reflect the learning outcomes expected of students (ARC-PA, 2018).
>
> ARC-PA Standard A2.14: In addition to the principal faculty, there must be sufficient instructional faculty [Adjunct faculty] to provide students with the necessary attention, instruction and supervised clinical practice experiences to acquire the knowledge and competence required for entry into the profession.
>
> ANNOTATION: Instructional faculty participate in the evaluation of student performance and in the identification of students who are not achieving course and program learning outcomes (ARC-PA, 2018).

It is clear the ARC-PA understands the need for instructional faculty and has a strong interest in making sure those instructional faculty meet the educational expectations of the

accrediting body. The ARC-PA accreditation standards are policies PA programs must abide by to remain accredited. This relationship requires the ARC-PA to assess PA programs and ensure they meet quality standards. Maintaining accreditation is paramount because students must graduate from an accredited program to be eligible to take their national board exam. States will not license PAs to practice unless they have taken, and passed, the national board exam. The PA program leadership is responsible for maintaining accreditation. Students, who have invested time and money into their education, rely on PA programs to maintain this accreditation. The ARC-PA has an immense amount of power over PA programs.

1.3.2 Instructional Faculty

Instructional faculty find themselves moving from a place in which they were an expert, to one in which they are a novice. The confidence and self-assuredness that came with clinical practice is potentially replaced by hesitancy and uncertainty in academic practice. This idea was supported by our empathy interview with one of the instructional faculty members in our department. Our empathy interview was with a new instructional faculty member who, despite having significant experience in her medical specialty, was a novice in academia. During the interview, she nearly restated our problem of practice without being prompted. She spoke of her patient care and clinical skills within the realm of her primary PA position in a bold and confident way. Then, she started talking about her new role in the program as a lead instructor for a course and became less confident. She even said she felt uncomfortable writing exam questions and asking for our feedback because she felt she did not have the expertise to write them. Consequently, this empathy interview supported our definition of our problem of practice.

Instructional faculty have a responsibility to the students; to teach them effectively. They also have a responsibility to the program; to meet expectations as faculty. Mastery of these obligations requires collaboration with principal faculty. Because instructional faculty are already paid by their full-time clinical employers, the compensation from the program is essentially a financial bonus. Their work produces value for the students, and the program, as well as short-term returns for all involved, including the instructional faculty. Unfortunately, there is no financial incentive for instructional faculty to produce quality work or good results. Because their instructional faculty position is not their primary job role nor their primary source of income, they may not be motivated to learn new skills or collaborate with principal faculty to the level necessary to meet accreditation expectations.

1.3.3 Principal Faculty

The principal faculty see their primary role as fulfilling the teaching, service, and research aspects of their position. As a professional program, their responsibilities are skewed more towards teaching and service rather than research. New principal faculty often also come to academia from full-time clinical practice. The difference between the new principal faculty and the instructional faculty is that the new principal faculty benefit from the mentoring of existing faculty and also from an array of faculty development offerings produced by our national association of PA educators. New principal faculty also have the ability to devote full-time effort to their role in the program; instructional faculty do not. Often, based on their clinical specialty, principal faculty may require the use of adjunct faculty to fill gaps in content knowledge within their courses.

Anecdotal evidence supports that not all instructional faculty "do a good job". Additionally, discussion about which instructional faculty member to recruit for certain lectures and activities based on their skill level. At accreditation time, one faculty member even said their "Teaching Survey scores suffer" because of the use of instructional faculty in their course, however, they also stated they still needed the instructional faculty to teach in their course because the instructional faculty are content experts in areas in which the principal faculty member is not. Sometimes a disagreement between student opinion and principal faculty opinion arises regarding the skill of certain instructional faculty. The student survey numbers may be at benchmark, because the "students love that faculty member", but when evaluated from a principal faculty perspective, the instructional faculty material may have lacked depth or been inadequate in some other way.

1.3.4 PA Students

PA students want a return on their investment of time and money into their education. They want to learn in a way that is suitable to their learning styles, and they want to be taught by qualified experts. Students are a point of contact for self-assessment processes but need to be protected from survey fatigue. Currently, students do complete surveys after instructional faculty lectures and complete university- required teaching surveys (termed OMETs at the University of Pittsburgh) after taking a course taught by an instructional faculty member. Due to the anonymous nature of the OMET collection system, and our own personal experience in receiving this student feedback, we have no concern that the students' seemingly subordinate position would limit the fidelity of their responses.

1.4 Statement of the Problem of Practice

Clinically practicing PAs are not adequately prepared to function effectively as instructional faculty in PA programs.

1.4.1 General Statement

In general, faculty development for both principal and instructional faculty is a problem in PA education. This problem may stem from a variety of causes including the education and training of PAs and the position and standing of PA programs within institutions of higher education. This problem is compounded by the rapid expansion of new training programs and their need for qualified faculty, concerns regarding existing faculty satisfaction, and the threat of faculty attrition. Within our own institution there has been strong support for principal faculty to attend faculty development workshops and for principal faculty who wish to pursue further formal education, but these opportunities are not available for instructional faculty. The PAEA, the national organization representing PA educators, recently developed and released a competency framework to develop the skills of PA educators. The relevance and impact of these competencies is yet to be determined.

1.4.2 Context and Setting

Because of the local impact of this problem, we were able to investigate it in our current place of practice. As Program Director and as Director of Didactic Education, one of our shared roles is to oversee the curriculum in the first-graduate year. This oversight includes curriculum

delivery and evaluation, student remediation, new didactic faculty onboarding, and the processes and policies surrounding scheduling and evaluating adjunct faculty. Within these responsibilities several concepts are amenable to further study and intervention. Student assessment and remediation, student advising, faculty mentorship, and curricular evaluation are all important concepts for instructional faculty to understand. These concepts also can be aligned with the PA Educator Competencies as defined by PAEA and described above.

1.5 Review of Supporting Knowledge

Physician Assistants (PAs) are professionals who practice medicine in collaboration with, or under the supervision of, a physician. Currently, PAs are trained at the graduate level. They perform history and physical examinations, order and interpret diagnostic testing, prescribe medications, perform procedures, and assist in surgeries. They work in every medical specialty in every state in the United States, as well as in some international locations. The profession is just over 50 years old, but has undergone radical change in that time period.

The Physician Assistant (PA) profession has grown substantially over the last half century in prestige, in educational methodology, and in scope of practice. Recently, the profession has approached a new frontier of growth supported by a proliferation of new PA training programs. Aside from some nascent doctoral programs, there is no specific educational program to train clinically-practicing PAs to become educators. Teaching is not a part of graduate PA curricula, thus, PAs who become faculty members are transitioning to that role from full-time clinical practice. Once hired as full-time, principal faculty, many opportunities exist to support the

professional development of these principal faculty through the Physician Assistant Education Association (PAEA) and other institution-based programs.

As is the custom in PA education, PA programs use adjunct faculty, often termed "guest lecturers" or "instructional faculty" by accreditation terminology, to deliver curricular content in their areas of specialty. These instructional faculty members are generally full-time clinically practicing PAs. Although not principal faculty, they are an integral part of the curriculum delivery. They are content experts in their field, but generally do not have any additional formal instruction in the roles and responsibilities of a faculty member, or even in the general domain of higher education. As a result, clinically practicing PAs are not adequately prepared to function effectively as instructional faculty in PA programs.

Exploring the history of PA education can illuminate some potential causes for skill gaps that render clinically practicing PAs unprepared to teach in higher education. PA education has evolved from an informal curriculum for retired Navy Corpsmen resulting in a certification to a rapidly growing profession terminating in a master's degree (AAPA, 2021). From the beginning, the goal of PA education was rapid deployment of skilled professionals. Because of this, the traditional models for post-secondary medical education were abandoned (Ballweg, Brown, Vetrosky, & Ritsema, 2018). Additionally, due to the need to design a more practical curriculum, elements that would customarily be presented in medical schools were removed from the PA curriculum. In-depth study of content areas regarding basic science and research were not generally included in the PA curriculum (Ballweg et al., 2018).

In the early days of PA education, the relationship with physicians was strong. Most programs were housed within medical schools, and physicians were the primary educators of PAs (Cawley, Jones, Miller, & Orcutt, 2016; Jones, 2007; Wright, Cawley, Hooker, & Ahuja, 2009).

PAs did not need to be prepared to be faculty members. Eventually due to the growth of the profession, and spurred by federal funding, new PA training programs expanded into other institutions such as liberal arts universities and could be found within allied health schools rather than medical schools (Cawley et al., 2016; Keahey & Abdullah, 2017; Wright et al., 2009). PA students in these locations had limited exposure to concepts such as research and the academic practice of medicine. The PA profession remained connected to physicians despite this growth, but less so, and PAs became the primary educators of PA students.

The transition from full-time clinician to full-time educator takes a significant amount of support. Once these clinicians are employed as a full-time faculty member in a PA program, many professional development opportunities from the national association for PA educators are available to them. In addition to the primary, full-time faculty, PA training programs commonly use instructional faculty to help deliver the curriculum in the didactic year. These instructional faculty are most often full-time practicing clinicians who are content experts. Though the amount of participation in the curriculum may vary by individual, instructional faculty are integral to the education of PA students. Despite the importance of the instructional faculty, no current, standardized, preparation of professional development opportunities are available to these faculty. Although the national education association offers workshops, they are primarily attended by principal faculty. PA programs do not have the resources to send instructional faculty to these workshops. The primary focus for many instructional faculty is their clinical practice, which is their full-time job, so it is unreasonable to expect them to attend a multi-day workshop. Also, the accrediting body tasks programs with orienting and collaborating with instructional faculty; the responsibility for professional development of instructional faculty lies with each PA program.

Other disciplines, within and outside of the health sciences, also employ content experts as instructional faculty, often referred to adjunct faculty outside of the PA education realm (Forbes, Hickey, & White, 2010; Hurst, 2010; Santisteban & Egues, 2014; West, 2010). Exploring the methods other professions use for adjunct faculty development will enhance our understanding of how adjunct faculty are prepared to contribute to the education of other professionals.

When considering the lack of formal educational training of instructional PA faculty, it is necessary to understand what preparation instructional faculty need to teach PA students. The knowledge and skills necessary for PA educators, in general, to perform their required duties effectively are referred to as competencies. Although initially developed for medical trainees, the idea of mastery of various competency domains has spread to various health care disciplines and to health science educators (Hatem et al., 2011; Milner, Gusic, & Thorndyke, 2011; Zaweski, Melcher, Sedrak, Von, & Fletcher, 2019). Understanding how competencies are developed, used, and assessed, can serve to demonstrate adequate faculty performance or can provide a foundation for necessary faculty development initiatives. These initiatives can then be used to prepare new instructional PA faculty and provide enrichment to current instructional PA faculty.

1.5.1 The Education of Physician Assistants (PAs)

Due to the significant population increase in the United States in the 1940's and 1950's, and the incentivization for physicians to practice in medical specialties, there was a predicted impending shortage of physicians, particularly those who provide primary care services (Cawley, Cawthon, & Hooker, 2012). The concept of the PA profession was the result of necessity and ingenuity. The plan for this new type of medical provider was to take someone who already possessed some medical skills and experience and train them, in a shorter period of time, to practice

medicine under the supervision of a physician. Former Navy corpsmen, particularly Vietnam veterans, were thought to be the best choice to pilot this new concept due to their unique medical experience (Cawley et al., 2012; Jones, 2007).

Dr. Eugene Stead founded the first training program for PAs at Duke University in 1965. Dr. Stead along with Dr. E. Harvey Estes developed, and expanded, the two-year training program at Duke (Cawley et al., 2012). Within a few years, the University of Washington, guided by the vision of Richard A. Smith began its own PA training program, known then and still known today, as the MEDEX program. This one-year program also enrolled military veterans, but required significantly more health care experience prior to admission than was required by Duke.

The methods used to train PAs were unique in medical education. In some ways it was modeled after military rapid training methods designed to meet specific objectives (Ballweg et al., 2018). Additionally, PA training provided a sharp contrast to conventional medical training because it was not reliant upon traditional higher education models, requirements, or degrees. PAs were trained to perform skills, and perform them well. This approach to PA training abandoned the traditional sequence of medical education which required mastery of basic sciences before clinical medical topics could be taught. The approach also did not include instruction in medical research, scholarly writing, or publication. The method was a common-sense approach, designed to quickly train and deploy medical providers to areas of need.

Due to the close relationship with physicians, many early training programs had an apprenticeship component. This type of teaching has been, and still is, part of modern-day PA and medical education although the terminology has changed. The professional bond between physicians and PAs is so close that in its early stages, and still in many states today, a PA's medical license and potential medical liability is linked to that of the physician who supervises them. This

connection serves as another tangible marker of physician support of the PA profession (Ballweg et al., 2018).

As the concept of PA training programs gained popularity, they began to expand across the United States. They were endorsed by physician groups and supported through federal funding (Cawley et al., 2016; Keahey & Abdullah, 2017; Wright, Cawley, Hooker, & Ahuja, 2009). In the early 1970's most PA programs were housed within medical schools (Cawley et al., 2016; Jones, 2007; Wright et al., 2009). The inception of the profession and its initial expansion was rooted in the relationship with, and support of, physicians. This professional acceptance and support may have played a significant role in the resultant federal funding of these programs. Additionally, the connection with medical schools would serve to strengthen the professional bond with physicians and ensure the PA profession stayed entrenched in the medical model of education for which it is known, and even today cites as a key quality that sets it apart from other allied health professions.

After the initial rapid increase in the number of training programs, growth slowed as federal funding decreased (Cawley et al., 2016). The next period of growth in the 1990's resulted in more programs being developed and housed in private institutions, not in academic medical centers, and this trend has continued today (Cawley et al., 2016; Jones, 2007). PA education is lucrative for sponsoring institutions, particularly for small institutions, leading some critics to call them "tuition cash cows" (Cawley et al., 2016). Although not studied specifically in PA education, this phenomenon has been documented in other disciplines within higher education. Some institutions who are struggling financially have benefitted from the revenue generated from graduate programs in general, specifically master's degrees programs, by using the funding to help balance budgets, subsidize other academic units, or to make up for reductions in state funding (Marcus, 2017). Graduate programs offer greater potential for revenue due to their increased cost and the ability

for students to borrow more to finance a graduate education. The projected growth of the PA profession and the requirement of a master's degree to enter the field creates a demand that supports the expansion of PA programs.

Today, no uniformity exists in the location of PA training programs within the hierarchy of higher education. Some PA training programs are units within a department, others are stand-alone departments. Some programs are housed in medical schools while others are in schools of allied health or health sciences. Even the type of institution is variable, PA programs can be found in large, high research intensive universities, but also in small, private colleges (Wright et al., 2009).

This variability results in differences in power and position. PAs are said to be trained in the medical model, meaning their curriculum is similar to that of medical school. When compared to physician training, however, PAs have a shorter length of training, less exposure to basic sciences, a weaker connection to the teaching aspect of training, and no standardized or significant preparation for research or publication. As a result, many practicing PAs are less qualified than their medical peers to enter academia and pursue the role of tenure stream faculty who are prepared to teach effectively and excel in research.

Although the model of apprenticeship, now termed supervised clinical practice experiences (SCPEs), was the primary method of education in the early days of the profession, PA education quickly become more formalized and to culminate in a degree. Initial certificate programs eventually coexisted with baccalaureate and graduate degree-granting training programs. In the late 1960's specialty degree programs in surgery and pediatrics were developed (Miller & Ziegler, 2018). PAs are now also eligible to enter post-graduate PA residencies in specialties such as surgery or critical care. This concept was pioneered in 1971 by Montefiore Hospital in New York

(Miller &Ziegler, 2018). Recent debate has surrounded the concept of a clinical doctorate for PAs. Some considerations for advancing the degree include keeping pace with other allied health professions such as Nursing, Physical Therapy and Audiology, but critics cite a lack of practical need for the advanced degree and feel it is purely inspired by a social mobility mode of thinking (Jones, 2007). A doctoral degree may not be helpful for practicing PAs; their job duties would not change based on the degree they have earned. For PAs in health care administration, health care leadership, or in higher education, however, a doctoral degree is sometimes the difference between having the power advocate for the profession or not having the agency to even make decisions in their place of employment. The lack of a doctoral degree can exclude faculty from graduate faculty appointments within the institution or the ability to serve on some committees thereby reducing the representation and influence of the profession. One example of these barriers is our current promotion and tenure criteria in our school.

As the training models for PAs were evolving, so were PA faculty. No longer were physicians alone responsible for educating PA students; PAs themselves joined the faculty ranks. Today, most faculty members in PA programs are PAs. Physician medical directors provide curricular oversight. Among all faculty in PA programs in the United States, approximately 75% have a master's degree as their highest degree held, and nearly 80% report their immediate past employment as clinical practice (Yuen & Lessard, 2018). Few PAs have prior experience in higher education before taking positions in training programs. Given their degree status, few PA faculty have the security of tenure. Nationally, only 18% of PA faculty are tenured or on a tenure track (Yuen & Lessard, 2018). Without tenure, most PA faculty lack the security which will support their longevity within the academy.

Their lack of formal training in teaching and research coupled with their terminal master's degree puts PAs in subordinate positions within higher education where the doctoral degree and research prowess reign supreme. Publishing is generally an expectation of most faculty in higher education, but less than half of PA educators have published in the entire span of their academic career (Yuen & Lessard, 2018). Several barriers are identified in the literature that may contribute to this such as the degree requirement for being hired as a PA as a master's degree; the lack of research training in PA education programs; and the lack of protected research time for faculty (Ritsema & Cawley, 2014; Warner, 2013). The low production of scholarly work may contribute to the academic rank held by most PA faculty. More than 60% of PA faculty report their current academic rank to be that of non-tenured lecturer or instructor, and 11% hold the rank of tenured Professor (Yuen & Lessard, 2018, p.14). According to the National Center for Education Statistics, 22% of faculty in higher education hold the rank of tenured professor and 17% hold the rank of non-tenure instructor or lecturer (Digest of Education Statistics, 2018). In comparison to faculty across the university, PA faculty tenure ranks are lagging.

These data, reported by full-time principal faculty, also represent barriers to advancement. Issues of low scholarly productivity, low faculty rank, and variable placement within the political hierarchy of higher education raise questions regarding the potential negative impact on the training environment of PA students, the standing of training programs within the institutional hierarchy, and the ability of faculty to advocate for the credibility of the profession itself. The lack of exposure to an academic track in PA training and the fact that many PAs do not possess doctoral degrees risks putting future educators behind in higher education environment. These disparities put the long-term success of PA programs at risk because they do not have faculty who are well-positioned in higher education due to their degrees and ranks. The downstream effects are many:

PA programs may not be able to advocate in the right levels of leadership; PA programs may not be given the resources and opportunities to advance their mission; without resources, students cannot be trained and served adequately. If PA programs are compromised and cannot produce well-trained students, the very profession itself will eventually become obsolete.

1.5.2 Instructional Faculty Development

Physician Assistant (PA) training programs commonly employ instructional faculty, as practitioner-educators, to help deliver the curriculum. These instructional faculty members are often full-time clinicians who may teach as little as one lecture or as much as one entire course. This practice, however, is not unique to PA education. Other professional education programs in disciplines such as nursing, physical therapy, and business also employ adjunct faculty in this manner (Forbes, Hickey, & White, 2010; Hurst, 2010; Santisteban & Egues, 2014; West, 2010). These disciplines also experience similar benefits and struggles surrounding adjunct faculty. Their experiences can help identify the needs of adjunct faculty and offer recommendations for best practices for instructional faculty development.

The inclusion of instructional faculty, who are content experts practicing in their field, is valuable to professional programs. Instructional faculty are able share their knowledge and clinical expertise with students as actively working practitioners. The use of instructional faculty is an arrangement that is sometimes born of necessity as it is also a way of extending the reach of principal faculty. The use of adjunct faculty for this reason is prevalent in the field of nursing in which the recruitment of adjunct faculty is a response to a shortage of qualified full-time faculty (Forbes et al., 2010; Santisteban & Egues, 2014).

Although using instructional faculty in this way is generally beneficial to the education of PAs, challenges with the use of instructional faculty have been identified. Generally speaking, adjunct faculty, although qualified in their fields, have not had formal preparation to teach in higher education or function in faculty roles within the setting of academia. (Forbes et al., 2010; Glicken, 2008; Santisteban & Egues, 2014; West, 2010). Adjunct faculty typically do not have experience creating syllabi, developing course objectives, or creating assessments (Forbes et al., 2010b; West, 2010). Concerns also exist regarding their teaching effectiveness (Forbes et al., 2010b; West, 2010). In some cases adjunct faculty are expected to participate in research, a task for which they are underprepared since their primary training is that of a practitioner, not a scholar (Forbes et al., 2010b; Hurst, 2010).

Adjunct faculty recognize these challenges, too. Adjuncts note common obstacles and concerns. Although orientation upon hire, in various forms, is common in institutions, it can be insufficient to support adjunct faculty. Adjuncts identified the need for written guidelines or a handbook, and consistent guidance regarding policies and common educational practices to sustain them beyond their initial orientation (Forbes et al., 2010; Santisteban & Egues, 2014). The need for clear guidelines and consistency when seeking answers to questions was also found to be a concern of adjunct faculty (Forbes et al., 2010b; Hurst, 2010).

Concepts surrounding identity and culture change were also noted as concerns of adjunct faculty. The idea of transitioning from practitioner to educator is one that requires one to shift from a position of expert to one of novice (Hurst, 2010; West, 2010). Transitions such as this can be made easier when support mechanisms are in place. Although they play an integral role in the curriculum, adjuncts may not feel connected to the training program. Feelings of isolation or feelings that they were not truly a part of the department or institution are common. (Forbes et al.,

2010; Santisteban & Egues, 2014; West, 2010). The desire for a personal point of contact or mentorship was also expressed (Forbes et al., 2010; Santisteban & Egues, 2014; West, 2010). This type of support provides encouragement and a sense of belonging, and can help raise awareness of the skills which must be developed to function successfully in academia.

Adjuncts are willing to develop these skills. They seek to have a better understanding of their roles, learn about the resources and technology that are available to them as educators, and learn pedagogy and adult learning theory (Forbes et al., 2010; Santisteban & Egues, 2014). There is both a need and a desire for formal educational seminars or program-specific certificate programs to enhance teaching skills. (Forbes et al., 2010; Hurst, 2010; Santisteban & Egues, 2014).

Recognizing the lack of formal preparation of adjunct faculty and their expressed needs for faculty development, institutions have undertaken initiatives and made recommendations for best practices surrounding these issues. These initiatives should start from the time of hire and include a thorough orientation and written guidelines that include intuitional policies to serve as an enduring reference document (Forbes et al., 2010; Hurst, 2010; Santisteban & Egues, 2014; West, 2010). A formal mentoring arrangement, or at least the identification of person who can serve as common point of contact within the institution, was also a common theme (Forbes et al., 2010; Santisteban & Egues, 2014; West, 2010).

Mechanisms to improve general engagement and integration of adjunct faculty are also beneficial. Including adjuncts virtually in faculty meetings, in person or by memo, or email helpful articles regarding teaching skills (Forbes et al., 2010b; West, 2010) are examples of how to integrate and engage adjuncts. Social engagement also decreases the commonly felt sense of isolation and enhances networking among adjuncts and others in the institution. Invitations to

social events, ceremonies, and university events are some ways of accomplishing this (Forbes et al., 2010b; West, 2010).

Institutions can also offer formal programs or workshops to enhance adjunct development. Workshops covering basic concepts of pedagogy, faculty roles regarding syllabi and assessments, concepts surrounding student communication, and even the general culture of higher education have been recommended (Forbes et al., 2010; Glicken, 2008; Santisteban & Egues, 2014; West, 2010). Some institutions have even developed formal certificate tracks for their adjunct faculty (Forbes et al., 2010b; Hurst, 2010).

Despite the great benefit of their expertise to training programs, a lack of formal preparation for adjunct faculty to teach still exists. Adjuncts, themselves, have expressed their need for further development within their roles in higher education. This evidence supports the need to operationalize the recommendations for best practices in adjunct faculty development to create a robust process for developing content experts into effective educators.

1.5.3 Competencies for Medical Educators

Professional competencies are the knowledge and skills necessary for a professional to properly, and in the case of medicine, safely perform their job. Although considered to be prerequisites for performance, competencies are not stagnant concepts. The acquisition of new competency domains allows a professional to grow and enables those in the medical sciences to respond to the changing landscape of health care and patient care needs. When considering the problem of the lack of preparation for adjunct faculty to teach in PA programs, competencies can be part of the solution. Competencies can define what adjunct faculty need to know and what skills they need to master to function effectively in PA programs. Exploring existing competencies for

medical educators and how they are identified, developed, and used, can provide the foundation for adjunct faculty development initiatives.

In medicine, the idea of competencies began in graduate education as part of the training curriculum for resident physicians. The development of competency frameworks supported the need to demonstrate an outcomes-based curriculum, such as a curriculum in which resident physicians had been proven to provide safe and appropriate care (Milner et al., 2011; Zaweski et al., 2019). The concept of competency-based education programs has since spread to many other disciplines within the health sciences including nursing, dental medicine, health care administration, pharmacy, and even veterinary medicine (Hatem et al., 2011; Milner et al., 2011; Zaweski et al., 2019). In addition, competency-based training has not been limited to the education of medical practitioners. Such training has also been adopted for the preparation of those who teach the practitioners.

In health sciences education, the initiation of competency-based teaching practices occurred for a variety of reasons. Many new educators come to academia from full-time clinical practice. To succeed in the academic environment, clinicians need a new skill set that will enhance teaching skills and support the possibility of career advancement (Gonzalo et al., 2018; Hatem et al., 2011; Milner et al., 2011; Zaweski et al., 2019). In many disciplines, notably physician assistant training and dental medicine, shortages of qualified faculty are often the catalyst for developing competencies to guide professional development (Hand, 2006; Zaweski et al., 2019). These disciplines also struggle recruit and retain experienced faculty often due to attrition, retirement, or the rapid expansion of training programs (Hand, 2006; Zaweski et al., 2019). In some instances, particularly in academic medical centers, competencies help medical educators develop

transferrable skills that allow them to adapt their teaching to the changing needs of medical trainees (Gonzalo et al., 2018; Milner et al., 2011).

Developing a competency framework that is both relevant and adaptable is necessary to meet the diverse needs of medical educators in various settings. An extensive literature review may yield a useful framework, but more commonly, additional research is necessary to develop a framework that is suitable a particular profession. Seeking expert feedback can determine which competencies are relevant to a specific discipline and support the development of a framework. The Delphi method (a research methodology used to solicit expert feedback for understanding of ideas and tools), for example, has been used to develop frameworks in medical, dental, and physician assistant programs (Hand, 2006; Milner et al., 2011; Zaweski et al., 2019). Another strategy used to broaden an understanding clinician-educators needs is survey. Directly surveying this population allows for hearing their perspectives and self-identified development needs (Gardner, Waters, & McLaughlin, 2017; Gonzalo et al., 2018). The combination of expert opinion and expressed need can support the development of useful competency domains.

Exploring examples of competency frameworks is essential to develop a deeper understanding of how this concept can be applied to faculty in an academic medical setting. Generally competency frameworks are organized by general competency domains with specific skills as a subset of each domain (Gonzalo et al., 2018; Hand, 2006; Zaweski et al., 2019). Common language exists among many frameworks in the medical sciences. The identification of foundational and functional domains is prevalent, but domains within those categories are often distinct and specific to the discipline and setting (Gonzalo et al., 2018; Hand, 2006; Zaweski et al., 2019).

In some cases, foundational competency domains are those that focus on clinical and/or teaching expertise (Hand, 2006; Zaweski et al., 2019). In other instances, foundational competencies focus on administrative and leadership aspects of education (Gonzalo et al., 2018). One specific domain even encompassed skills necessary to meet challenges associated with the academic medical center setting (Gonzalo et al., 2018). Although the emphasis varies among discipline and setting, the identification of competencies specific to teaching, clinical practice, and administration or leadership are generally present. The rich variety of exemplars that exist in the literature can provide inspiration for the development of new competencies that can be transferrable to nearly any medical science discipline.

Within PA education, the PAEA developed PA Educator Competencies in 2018 (Zaweski et al., 2019). Foundational competency domains, those that are central to the function of all PA educators, are defined as:

- Teaching,
- Learner-Centeredness,
- Interprofessional and Communication Skills, and
- Professionalism and Role-Modeling.

Functional, or more specialized domains, have been defined for some faculty based on their roles within the training program. These domains include:

- Program and Curriculum Design and Implementation,
- Program Evaluation,
- Scholarship Development,
- Leadership, and
- Mentorship.

Each domain has a subset of skills and behaviors that serve as objective measures of mastery for that competency domain, see **Appendix C.** Because these competencies have just been newly established, research on best practices, operationalization, or efficacy does not yet exist.

Once a competency framework has been established for a discipline, the next logical step is to consider how this framework will be used with in professional preparation. The primary function of the framework is to guide faculty development initiatives (Gardner et al., 2017; Gonzalo et al., 2018; Hand, 2006; Hatem et al., 2011; Milner et al., 2011; Zaweski et al., 2019). Some disagreement exists among the various medical disciplines regarding whether or not the attainment of competencies should be used for assessment means, career promotion, or professional development. Some in medicine feel measurable competencies provide an excellent way to assess job performance and support promotion and advancement (Hatem et al., 2011; Milner et al., 2011). In the PA discipline, professional literature clearly states that identified competencies are not to be used for assessment or promotion (Zaweski et al., 2019). Across the medical field, each discipline and individual institution determine the value and role of their relevant competency frameworks, whether it be to support faculty development or to guide the promotion and tenure process.

1.6 Conclusion

The PA profession is experiencing a period of rapid growth. In a little more than 50 years, the profession has grown from an experimental job classification to a profession that enhances care in every medical specialty. The training of PAs has expanded from a certification to an entry-level master's degree. PA education has been supported by a variety of federal funding initiatives that

have led to eras of expansion and change. In the modern era of the profession, PAs are no longer trained only by physicians. Rather, PAs themselves have joined the faculty ranks. With an increasing number of new PA training programs, the demand for qualified faculty has also increased.

As PA educators enter PA programs to teach, few have experience in higher education because most have come to academia from full-time clinical practice (Yuen & Lessard, 2018). Although a master's degree qualifies a PA to practice medicine and surgery in the clinical setting, that level of esteem does not always transfer to higher education where the doctoral degree reigns supreme. Lacking doctoral preparation may leave new PA educators unprepared to teach and research, both of which are fundamental to survival and longevity in the academy. For full-time, principal faculty these gaps are often filled through the support of institutions, mentors, and a national organization.

Most PA programs employ instructional faculty as content experts to help deliver the curriculum; this arrangement is not unique to PA education as other graduate professional disciplines use this approach as well (Forbes et al., 2010b; Hurst, 2010; Santisteban & Egues, 2014; West, 2010). Although their content expertise is invaluable, these instructional faculty often lack skills in the basic roles of faculty such as creating syllabi or assessments (Forbes et al., 2010b; West, 2010). They may also feel unprepared to contribute to scholarly activity since their primary role is that of a clinician. In professional programs, adjunct faculty have expressed a desire to improve their skills and their feeling of connection to the training program in the form of a more robust orientation or formal educational seminars (Forbes et al., 2010b; Hurst, 2010; Santisteban & Egues, 2014b). A need for adjunct faculty development exists and, likewise, adjunct faculty desire opportunities for engagement and enrichment.

In order to meet this need, employing professional competencies is one way to design and support professional development initiatives for instructional faculty. Professional competencies are considered to be the compilation of knowledge and skills necessary for a professional to competently and safely perform their job functions. In medicine, the concept of competencies began with practitioners and were adapted and expanded to include medical educators. Other professions in the health sciences have adopted educator competencies as a way to assist those whose roles are shifting from practitioner to educator (Gonzalo et al., 2018; Hatem et al., 2011; Milner et al., 2011; Zaweski et al., 2019). Competencies also serve as a method of enrichment for current faculty.

In the fall of 2018, the PAEA developed PA Educator Competencies designed for PA faculty (Zaweski et al., 2019). In line with the common language for competencies in health science education, they were divided into foundational (core) and functional (specialized) domains. Each domain has a subset of skills and behaviors that serve as objective measures of mastery of that competency domain. Because these competencies have just been newly established, scholarship surrounding best practices, operationalization, or efficacy does not yet exist.

In health sciences education, no consensus exists regarding the best use of competencies whether they are used just for professional development or if they should be used as a method of assessment that could inform promotion and tenure decisions. The PA literature is clear in stating their identified competencies are not to be used for assessment or promotion (Zaweski et al., 2019). The primary function of professional competencies in the health sciences is to inform faculty development initiatives for principal faculty (Gardner PhD et al., 2017; Gonzalo et al., 2018; Hand, 2006; Hatem et al., 2011; Milner et al., 2011; Zaweski et al., 2019) These professional

competencies will also serve as a valuable framework to support instructional faculty development initiatives which will applied, studied improve fix our problem of practice.

2.0 Theory of Improvement & Implementation Plan

2.1 Theory of Improvement and the Change

Our aim statement was: by the next ARC-PA self-study in 2022, 90% or more of instructional faculty will be at or above the defined benchmark in the area of teaching effectiveness. Three key drivers provided opportunity for achieving our aim statement. These drivers were accreditation standards, instructional faculty support, and program self-assessment. Each of these primary drivers had secondary and tertiary drivers from which meaningful change could originate, see Appendix B.

2.2 Accreditation Standards

Accreditation standards carry a great deal of weight in our program, as they do in many professional programs. These standards require us to prove that we have provided orientation to instructional faculty, collaborated with them to meet student learning outcomes, and assessed their teaching effectiveness. Currently, we do not orient or collaborate with instructional faculty in a standardized fashion. The quality of these varied methods of orientation and collaboration is also of concern considering that the only faculty members who were below benchmark in teaching effectiveness during our last self-study were instructional faculty. Change can occur in this area by developing a standardized method of orientation and/or collaboration, such as a formal program or learning modules, and assessing the proximal outcomes surrounding that method.

If deemed effective, the success of these modules would impact the next level of our driver diagram demonstrating compliance with the orientation and collaboration requirement of the accreditation standards. The effects from this level of change would be evident by comparing the assessment scores from the previous self-study. If the instructional faculty meet the benchmark or if improvement occurs in their scores, then the change was effective. The improvement in instructional faculty assessment scores would link directly to our aim statement.

2.3 Instructional Faculty Support

Instructional faculty support is another primary driver. The idea of support can take many forms. Quite literally, this support can be financial. The program remunerates instructional faculty for their time and effort. True, meaningful, support goes beyond simple financial compensation. Principal faculty and instructional faculty alike must buy-in to this concept of support. Principal faculty must view supporting instructional faculty as a necessary and valuable part of their job and instructional faculty must be willing to accept this support. They must embrace a growth mindset and be willing to broaden their understanding of their role in the program.

Principal faculty must possess the necessary skills to provide this type of support and must have an incentive to participate in this additional task beyond their already heavy workload. Change in this area may be more difficult because it involves funding, motivation, and perhaps additional training for principal faculty to be mentors to instructional faculty. Additional interaction between principal and instructional faculty and enhanced remuneration would be signs of improvement in this area. Ultimately, for this instructional support driver to directly impact the

aim of the project, additional time and resources alone without standardization would have to improve the instructional faculty scores to the benchmark level at the next self-study.

2.4 Program Self-Assessment

Program self-assessment is an integral part of what we do as educators in a graduate professional program. The assessment process must be sound in order to result in meaningful data. This driver suggests that perhaps the assessment method used for benchmarking may not be accurate and/or appropriate. When we consider how we assess the efficacy of instructional faculty questions arise. Our accrediting body requires we use student surveys to assess this metric. These student surveys, for a variety of reasons, are problematic. Other variables in the assessment process that are within our control and can be used as tools to appropriately and accurately assess instructional faculty.

Although student surveys are required, the surveys are not required to be the sole assessment method. The accrediting body allows other methods of assessment to be submitted to support the benchmarking of teaching effectiveness. Unfortunately, our current process to augment student surveys lacks standardization. For example, the current process has no set schedule of peer observation and no procedure for feedback to instructional faculty based on review of student survey results and/or peer observation. Until recently, the questions used in the assessment and the frequency of assessment were not evidence-based. A potential improvement in the area of self-assessment would include enhanced assessment methods, additional forms of assessment, statistically sound benchmarks, and an appropriate schedule of assessment that allows for feedback and corrective action.

2.5 Improvement Target

Creating online learning modules as a means of professional development for instructional faculty will result in a standardized and effective orientation for these faculty members which will meet the accreditation requirement and will ultimately result in improved scores in the self-assessment area of teaching effectiveness. Because of our leadership roles within the program as Program Director and Director of Didactic Education, we are responsible for ensuring our compliance with accreditation standards affecting the didactic year curriculum. The didactic year is an area of the curriculum in which we heavily use instructional faculty. Secondary and tertiary drivers related to accreditation standards are ripe for improvement efforts because they are within our scope of practice and do not require significant additional resources such as funding. Compliance with accreditation standards is an area in which a change effort is likely to be most effective.

2.6 Intervention

Our intervention was based on a change idea stemming from one of our primary drivers which is accreditation standards. ARC-PA accreditation standards require orientation and collaboration for instructional faculty. Our problem of practice, clinically practicing PAs are not adequately prepared to function effectively as instructional faculty in PA programs, stems directly from this accreditation standard. The change idea was to provide a formal, standardized orientation to teaching for instructional faculty in the form of professional development modules.

2.7 Standardized Orientation

Currently, the PA studies program does not provide a formal, standardized method of orientation for instructional faculty. Any type of onboarding is left to the discretion of each course director who are all principal faculty. Upon hire, all principal faculty have undergone formal training through our national education association designed for professionals who are transitioning from clinical practice to PA education. The fact that the principal faculty have this training does not ensure that they pass their knowledge along to instructional faculty. Issues such as lack of buy-in, time constraints, and the reliance of instructional faculty for technical knowledge alone are some possible reasons that principal faculty do not appropriately onboard instructional faculty. These root causes were all also identified and noted on our Fishbone diagram (see Appendix A).

A standardized method of orientation, based on the PAEA's Physician Assistant Educator Competencies, would fill the gap between the ideal of a standardized and structured instructional faculty onboarding and the reality of the limited and variable onboarding that currently exists. Developed in the fall of 2018, PAEAs competency framework divides PA educator competencies into foundational and functional components (Zaweski et al., 2019). Although designed for principal faculty in breadth and depth, these competencies can be modified to provide an appropriate, and practical, level of knowledge to instructional faculty.

The orientation was provided in a series of online modules which made for a more readily accessible product than an in-person session. Each module covered one of the foundational competencies for the PA educator. These foundational competencies are Teaching; Learner-Centeredness; Interpersonal and Communication Skills; and Professionalism and Role-Modeling (Zaweski et al., 2019). Although other change ideas such as empowering or incentivizing principal

faculty to provide this service could be considered, these efforts are not likely to be standardized, will vary in quality, and would not necessarily be aligned with the evidence-based competencies developed by PAEA. Additionally, these other change ideas would add additional responsibilities to the already heavy workload of principal faculty.

2.8 Measurement

Participant surveys were the primary source of measurement of effectiveness for an online orientation module for instructional faculty. Pre and post surveys were designed to capture any change in the participants knowledge and perception of the orientation content. Survey questions were multiple choice and open-ended completion. Because these modules are designed for medical professionals who are most comfortable and familiar with a Continuing Medical Education (CME) framework, they were designed and measured in a similar manner. Instructional faculty received CME credit for successful completion of the modules. This CME credit can be applied to the participant's yearly certification and/or licensing requirements. This incentive also helped aid buy-in for those faculty who may have been reluctant to participate.

For the modules to qualify and be approved for CME credit by the CME accrediting body, specific types of measurement had to be employed. The general requirements were development of learning objectives for each module, a pre and post survey regarding the participants' understanding of the material as guided by learning objectives, questions regarding the utility of the material to the participant, and the quality of the presentation of the material. The assessment of the effect of these learning modules was a practical measure of change which will build towards future work.

2.9 Practical Measurement

This plan had several features of a practical measurement in improvement science. The action existed as part of the scope of our leadership roles in the program. The plan allowed for rapid PDSA cycles with easily accessible data. The first round of deploying the orientation module and assessing its outcome occurred within a span of 90 days or fewer.

This plan also built toward the evaluation of driver measures that will produce change in primary and secondary drivers. For example, once the instructional faculty have completed the orientation modules, their teaching effectiveness will be assessed. Although this level of assessment will be outside the scope of this project, we will explore the concept briefly. The orientation modules were based on the PAEA foundational competencies. The survey instruments used by our program to assess instructional faculty effectiveness are also tied back to the PAEA foundational competencies. Although this project assessed the efficacy of the modules, future work will assess the impact of these modules on teaching effectiveness scores, and ultimately our aim statement, by the year 2022.

A similar intervention and measurement method were used with medical educators in Australia when there was a need to train clinicians to become competent medical simulation educators. The clinician-educators completed online learning modules on learning theory, orientation to simulation education, and other relevant topics, and were surveyed at baseline and after completing the modules (Nestel et al., 2016). Survey items included: the degree to which the module met the learning objectives, the format of the learning experience, and the outcomes of the training program (Nestel et al., 2016). This similar endeavor is relevant to our project in that it used an online method to train medical educators and was successful in doing so.

2.10 Method/Design

Online orientation modules were deployed through the University of Pittsburgh's Center for Continuing Education in the Health Sciences. Current instructional faculty were recruited on a voluntary basis to participate. In the future, all new instructional faculty will be required to complete the module as part of their orientation/onboarding process. We do not anticipate this will hinder the hiring process for instructional faculty because any new hire would expect some level of orientation or on-boarding when starting in a new position.

Participants completed a baseline survey regarding their knowledge and perceptions of the module's content. This survey was based on the learning objectives for the module. After completing the module, the participants were then surveyed again to see if their knowledge and perceptions changed as a result of completing the module as described in the CME requirements discussed earlier.

2.11 Module Design Details

We developed four online modules based on the PAEA Foundational Competency domains. They are: Teaching, Learner-Centeredness, Communication Skills, Professionalism and Role Modeling. Each Panopto© module contained 30 minutes of asynchronous content presented in a podcast-style voice over slides format. There was additional time allotted for the participants to complete the pre- and post- assessments. We developed educational objectives for each module based on PAEA's existing competency framework and our professional experience. We then produced the modules around these objectives and recorded them using Panopto© software. With

the assistance of the UPMC Center for Continuing Education in the Health Sciences (CCEHS) we deployed the modules and their accompanying assessments and surveys using their Learning Management System (LMS). The LMS also supported our mixed methods inquiry including quantitative (multiple choice and Likert) and qualitative (open-ended descriptor questions) data which allowed us to understand the IPAF's perceptions of the online learning format. Additionally, the LMS had the capability of hosting the pre and post assessments in a secure and de-identified manner.

2.12 Future Work

This orientation module will inform our future work beyond the EdD program. This module will help develop the competency of PA instructional faculty as represented by the secondary driver in our theory of improvement. This competency is ultimately framed as the teaching effectiveness of instructional faculty, which is assessed by the program and represents the primary driver of accreditation standards. Benchmarks for teaching effectiveness of instructional faculty are also reported to our accrediting body as part of our self-study report, which is directly tied to our aim statement.

2.13 Inquiry Questions and Methods

Our change idea was to develop and deploy a formal, standardized orientation to teaching for instructional faculty within the Department of Physician Assistant Studies in the form of online

modules based on the PAEA educator competences in a Plan-Do-Study-Act (PDSA) cycle. The goal of this PDSA cycle was to improve IPAF's knowledge of the PAEA educator competencies and understand their perceptions of the online delivery format. We designed three main inquiry questions to determine if we have met the goal for this test:

1. Did the participants' content knowledge improve?
2. How effective was the online module format as an instructional method?
3. What were the Instructional PA Faculty's (IPAF) perceptions of the module delivery method and the value of the content contained within?

The first inquiry question was: *Did the participants' content knowledge improve*? The four modules, which were offered for CME credit, included pre and post objective knowledge assessments to answer this question. These multiple-choice tests determined if the participants' knowledge of the educational content presented improved as a result of the module, and if their scores were sufficient to earn CME credit. Because we were offering these for CME credit, guidelines for awarding credit require a minimum passing score to earn the credits and apply them to PA recertification requirements. We predicted that the participants' scores would improve. See Appendices D, E, F, and G for protocols.

The second inquiry question was: *How effective is the online module format as an instructional method*? Currently, principal PA faculty receive this type of instruction at in-person, multi-day, workshops. Because this type of training is generally not possible for IPAF who work full-time and do not have the financial support of their institutions, we wanted to know this type of content could be effectively disseminated in a shorter, online format. Additionally, since this project was successful, the online format will allow us to broadly distribute this concept easily to others in our organization and beyond. We asked the participants to score the effectiveness of the

online module format on an agreement Likert scale; we predicted a mean score of 3.5 or higher, indicating a more favorable response. See Appendix H for protocol.

The third inquiry question was: *What are the IPAF's perceptions of the module delivery method and the value of the content contained within*? With our first two inquiry questions, we assessed whether or not we improved the level of knowledge of the IPAF and the effectiveness of the online module format. With this third inquiry question we wanted to understand the experience of the IPAFs who have completed the modules and receive feedback on the modules *format* and *content* to improve them for future iterations of the PDSA cycle. See Appendix I for protocol.

At the conclusion of each module, we asked participants to describe the strengths of the online *format* and opportunities for improvement of the online *format*. We then asked participants which aspects of the *content* of these modules they found useful and planned to add to their teaching, and also to describe opportunities for improvement of the *content* of the modules. Because the concept of formally training IPAF has not been used previously, we predicted the online format would allow the IPAFs to gain the most benefit from the instruction with the least disruption to their lives as full-time practicing clinicians. Since they did not have to miss clinical work to attend an in-person training, we predicted they would rate the online module format favorably. We predicted the IPAF might suggest additional content topics we did not originally include. This oversight may stem from our own blind spots as experienced PA educators. We also predicted that participants may find the lack of interaction with presenters during the online modules to be a deficiency.

2.14 Assessment Design

We validated all assessment questions via expert review prior to distributing the modules to participants. Principal PA faculty in the University of Pittsburgh's Department of PA Studies evaluated the assessment questions for clarity and relevance to determine if the questions met the Content Validity Index benchmark score. We used the established benchmark score of 0.78 (Lynn, 1986). The questions we validated included: pre and post survey questions regarding the participants' content knowledge; effectiveness of the online format; and open-ended questions regarding perceptions of format and content.

2.15 Outcome Measures

The addition of a standardized orientation for IPAF, via online modules, was directly related to our aim statement, *by the next ARC-PA self-study in 2022, 90% or more of instructional faculty will be at or above the defined benchmark in the area of teaching effectiveness.* Currently, our program has no standardized or formalized orientation process for instructional faculty. The addition of our orientation modules will correct this deficiency and serves as a leading outcome measure. Our prediction was that the addition of this standardized orientation, linked to PAEA educator competencies, will ultimately improve the instructional faculty benchmark scores at the time of the next self-study.

2.16 Driver Measures

Providing IPAF with a standardized orientation, via online modules, improved their knowledge of PA educator competencies and satisfied the program orientation requirement. If the IPAF's knowledge of the competencies improve, we will see a positive effect on their scores in the interim IPAF teaching effectiveness surveys. This primary driver is directly linked to the overall benchmark score for the self-study described in the aim statement.

2.17 Process Measures

To determine if the process of implementing the modules was successful, we evaluated participant pre and post assessments. The analysis of content knowledge, effectiveness of the educational format, and perceptions of content and format supported our analysis of the process measures for this cycle. Because we saw improvements in content knowledge and have data to support the effectiveness of the online module format, we now know this change idea is an improvement over our current non-standardized process of orientation.

2.18 Balance Measures

We continuously monitored balance measures throughout this PDSA cycle to ensure it did not negatively impact the system. Although another improvement science project was simultaneously occurring in our department, that project involved a different cohort of students

and a different cohort of IPAF. Having two faculty members with administrative roles working on the development and assessment of these modules could have potentially depleted or negatively impacted human resources in a comparatively small department, as it relates to the university as a whole. Additionally, the IPAF were all working full-time clinical jobs. The potential for a negative impact in this area was especially true when considering the psychosocial stressors and additional duties surrounding performing this work during a global pandemic.

2.19 Analysis of Data

For inquiry question #1, we used descriptive statistics on pre/post data to analyze improvement, specifically means and standard deviations. To ensure the accuracy of our analysis, we consulted the University of Pittsburgh's Department of Statistics. A post-test score that is at least 20% higher than the pre-test score would indicate content knowledge improvement.

For inquiry question #2, we calculated the mean score of an agreement Likert using the following descriptors: 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree. We set the benchmark score for this question to 3.5/5 which is consistent with established PA program benchmark goals for our self-study documents, and has been previously approved by our accrediting body, the ARC-PA.

Finally, for inquiry question #3, we used qualitative analysis measures. Using the method outlined in Saldaña (2014), we read the free text comments from the open-ended questions and assigned codes based on major themes and identified similarities and differences within and across themes, which completed the analysis for this first PDSA cycle. Our primary goal for this line of inquiry was to determine how we could improve these modules for future iterations of the PDSA

cycle. We then used favorable response themes to support the continued inclusion of those concepts, and we used unfavorable responses to assist with improving future iterations of the modules. In the qualitative analysis future cycles, we reflected, elaborated, and compared to existing literature to inform next steps.

3.0 PDSA Results

We invited 121 Instructional PA faculty in the Department of Physician Assistant Studies to participate in this project. This number of participants represents a convenience sample taken from all Instructional Faculty in the department. Demographic data was not collected. The number of participants varied by module, with a minimum of 42 and a maximum of 48 completing the module including all pre and post assessments. This result represents a participation rate ranging from 34.7% to 39.6% of our target audience.

All pre and post survey questions regarding content knowledge, effectiveness of the online format and open-ended questions regarding perceptions of format and content were validated for relevance and clarity via expert review by the principal faculty of the Department of Physician Assistant Studies at the University of Pittsburgh. This validation was completed before deployment of the modules. All questions met the content validity benchmark of 0.78. An example of the validation process and calculation is pictured in Figure 1 below.

Pre and Post MCQ					
Clarity	Module 1	Module 1	Module 1	Module 1	Module 1
	Q1	Q2	Q3	Q4	Q5
Rater 1	4	3	4	4	4
Rater 2	4	4	4	4	4
Rater 3	4	3	4	4	4
Rater 4	4	4	4	4	4
Rater 5	4	4	4	4	4
	1	**1**	**1**	**1**	**1**

Figure 1. Sample of the Content Validity Index Scoring

3.1 Quantitative Results

For inquiry question 1, the University of Pittsburgh Department of Statistics assisted us in analyzing the quantitative data. We examined pre and post test scores for each module to determine if there was an improvement in the scores which would indicate an improvement in content knowledge. The protocol for this inquiry question included objective multiple-choice questions that were specific to the content of each module. There is a clear improvement from pre to post. Table 1 below shows the scores broken out by each module.

Table 1. Pre and Post Test Scores by Module

Module number	Minimum Score	Median Score	Maximum Score	Mean	Standard Deviation	n
Pre score 1	40	80	100	77.5	17.8	48
Post score 1	40	100	100	87.8	16.0	46
Pre score 2	40	80	100	75.5	17.2	44
Post score 2	60	80	100	83.6	10.8	44
Pre score 3	40	60	100	67.0	19.9	43
Post score 3	60	100	100	93.8	11.3	42
Pre score 4	40	80	100	77.1	15.7	42
Post score 4	60	100	100	91.4	11.8	42

Because we are investigating not only the difference in pre and post testing, but also the difference in performance of each module, an ANOVA test was performed. The ANOVA test showed a significant difference in pre and post scores as well as a difference in performance by module; module 3 was an outlier in that there is a clear difference in pre and post scores as compared to the other modules. Additionally, the pre score from Module 3 is relatively lower than the other modules. Overall, when comparing all modules, the pre and post means were significantly different, and the low p-value (<0.05) suggests this difference was not due to random chance.

These data are displayed in Table 2. The first line shows the variance between pre and post testing and the second line shows the comparison of pre and post to the module performance

overall. The F value shows the probability that the null hypothesis cannot be rejected. A large F value confirms that there is a significant variance that is not random. The Pr(>F) in AVOVA testing is the p-value associated with the F statistic. The large F value and low p value are confirmatory.

Table 2. ANOVA Testing Comparing Pre and Post Test Scores

	Sum Sq	Mean Sq	df	F value	Pr (>F)
Pre/post comparison	19415.6	19415.6	1	96.3	0.0000
Pre/post compared to modules	4480.9	1493.6	3	7.4	0.0001

These data can also be viewed in a box plot. Figure 2 shows the box plot data of pre and post test score by module. This graphic representation of the data shows the range of pre and post scores with the heavy black horizonal line showing the median score. Although all modules show improvement from pre to post, the box plot shows a visible and noticeable difference for Module 3. In Module 3, there is a larger range of scores, the median score is lower, and the pre-test score is lower than the pre-test score for the other modules. Modules 1, 2, and 4 all show similar differences between pre and post scores.

Figure 2. Box Plot of the Module Pre and Post Test Scores

In addition to a general improvement in pre and post test scores, we predicted at least a 20% improvement in the participants' content knowledge as measured by the pre and post test scores. The pre and post mean scores were 74.2 - 89.1 respectively across all modules. The difference between these mean scores is 14.9 with a 95% confidence interval of (11.9, 17.9). Since our pretest score is 74.2, an improvement of 20% equates to a change of 14.8, which is well within our confidence interval. The actual difference between pre and post scores is 14.9 which supports confirms our prediction of a 20% improvement.

For inquiry question 2, we investigated the effectiveness of the online module format as an instructional method. We analyzed the results of the course evaluations the participants completed after each module as rated on an agreement Likert scale. The study goal was to have a mean score of 3.5 out of 5. The mean score was found to be 4.6 out of 5. Application of parametric and non-parametric testing confirms this is statistically significant with a p-value of <0.001. These data are displayed in Table 3, below. Our prediction was that the participants would rate the effectiveness of the online module format on an agreement Likert scale with mean score of 3.5 or higher. This prediction was far surpassed with a mean score of 4.6 out of 5.

Table 3. Likert Scale Results of Online Module Format Effectiveness

Module number	Minimum Score	Median Score	Mean	Standard Deviation
1	1	5	4.6	0.8
2	2	5	4.6	0.5
3	1	5	4.5	0.9
4	1	5	4.6	0.8

Note. Likert Scale descriptors: 1 – Strongly Disagree; 2 – Disagree; 3 – Undecided; 4 –Agree; 5 – Strongly Agree.

3.2 Qualitative Results

For this part of the data analysis, we analyzed all participants comments to the open-ended questions at the end of each module as well as the questions regarding the online format. We reviewed and analyzed the qualitative data individually and identified emerging codes. We determined final codes and themes as a team.

3.2.1 Online Format

Inquiry question #3 was what were the Instructional PA Faculty's (IPAF) perceptions of the module delivery method and the value of the content contained within? For this question we employed qualitative analysis of the open-ended course evaluation questions to determine the strengths and weaknesses of the online format and the module content. To assess perceptions of the online delivery method format, in general, we asked participants to describe the strengths and opportunities for improvement. We received the de-identified responses and coded them using an evaluation coding method to determine themes regarding quality.

In analyzing the survey data for strengths of the online format, three main themes emerged. They were convenience, visual appeal, and podcast-style presentation. Participants cited the convenience of the online format in terms of timing and how it was easily able to be integrated into their professional and personal lives. They liked that fact they were able to complete the modules in any setting at any time. This feature was especially important for these participants, who are all full-time practicing clinicians, and have a variety of work schedules. One participant remarked, *"You can learn from any location, not just the classroom."* Another participant wrote, *"It was easy to access at any time that was convenient for me."*

A sub-theme, which we called enduring materials, also emerged. The modules were available to the participants 24-hours per day, 7 days per week. The participants could self-pace their participation, and within the module they could pause, rewind, and re-watch. They valued these features because they allowed participants the freedom to take more time to reflect on and process the material. One participant stated, *"I was able to pause on certain slides to make sure that I could thoroughly review them prior to continuing."* None of these features would be possible in face to face or synchronous sessions.

Participants also consistently found the online format to be visually appealing. They rated the online interface, access points, and design of the slides to be favorable. Participants felt the platform offered by the UPMC Center for Continuing Education in the Health Sciences was visually attractive and well organized. They were able to access each of the four modules seamlessly. Participants also rated the slides and graphics highly. One participant remarked, *"I loved seeing the information presented visually. The graphics utilized while both speakers discussed the topic helped to increase understanding."*

The audio of the modules was delivered in a podcast presentation style in which we both contributed to the discussion for each module. The positive rating of this presentation style was also found to be a theme. Participants found this style was more engaging and held their attention. Several participants remarked on the podcast style describing that it made them feel as if they were in the same space with the presenters.

Some less pertinent themes surrounding clarity and conciseness also emerged. We feel these attributes are not specific to the online format, but rather inherent to the instructional design. For example, *"the presenters gave concrete examples of theories presented in the module."* These qualities could be replicated in any type of presentation whether live/synchronous or

online/asynchronous. We feel it is important to include these themes in the discussion because they were found consistently throughout the responses.

In analyzing the survey data for opportunities for improvement of the online module format, we identified the themes of lack of interaction, evaluation format, and lack of access to course materials. First, because the sessions were asynchronous, participants were not able to interact with the presenters in real time to ask questions or for clarification. Additionally, there were no interactive features within the modules themselves. The participants were essentially passive observers of the content.

This second theme, evaluation format, highlighted some weaknesses in the pre/post evaluation format for these modules. The participants, as clinicians who are required to participate in CME activities, have experience with a pre/post testing evaluation format. The participants cited difficulty with navigation in the evaluation section and the inability to navigate back to the content to help answer questions, as well as difficulty navigating back to previously answered questions to change their responses. They also were not able to easily find the correct answers after their tests were scored. The issue of finding the correct answers after the exam was technical in nature and not under our control. Some of the other navigation features were intentionally disabled as part of the instructional design of the module. For example, we did not permit backwards navigation into the module content while the learners were completing the post-test. We wanted to ensure fidelity of their test item responses without access to the educational material.

Lack of perpetual access to physical copies of course materials was the third prominent theme identified as an area for improvement. Participants commented that they would have preferred to be able to download the material to keep for future reference. They also requested access to physical copies of some of the documents that were linked in the slides. Lastly, because

the ability to access the module ends after the post test, participants were not able to copy and paste the reference citations at the end of each presentation if they wanted to review them at a later date.

When planning this project, we made predictions regarding the IPAF's perceptions of the online delivery format. We predicted participants would like the convenience of the format but would cite lack of interaction with the presenters as a weakness. Our analysis of their survey responses confirms these predictions as well as making us aware of other strengths and opportunities as described above.

3.2.2 Module 1

The next level of analysis included feedback on the content contained within each module as it directly related to the participant in their role as a PA educator. Module 1 covered basic concepts surrounding teaching. A clear and pervasive theme was that of educational objectives. Nearly every participant rated this content as most beneficial. Many stated they were not even aware of the concept of developing educational objectives or how to write effective educational objectives. Participants described an increase in their preparedness level in this area after viewing the module. One participant commented, *"I now have a clearer understanding of how to write purposeful learning objectives."*

When asked how the content could be improved, two themes emerged — wanting more information and more examples. Participants expressed a desire for more in-depth learning about writing objectives and applying Bloom's Taxonomy. They also expressed the need for more examples of high-quality educational objectives and more examples of how to integrate case-based scenarios to enhance clinical reasoning skills. Participants commented as follows, *"...a few more*

specific examples of types of objectives and how to define them" and *"more detail about how to best present complex processes for student learning".*

3.2.3 Module 2

The topic of Module 2 was Learner-Centeredness in which we discussed principles of learner-centered instruction, privacy policies as they relate to students, and professional boundaries in graduate professional education. The two themes found consistently to be helpful to participants were understanding the inherently stressful conditions under which students are learning and policies that supported students at the university. One participant remarked, *"It helped me recognize that all students have different situations and not all programs and students are similar to the PA program I attended."* Another participant stated, *"…the concept of student stress. I need to recall what it is like to be a student and the volume of work for all their classes."* Many participants were previously unaware of policies and resources that support students in the university both in terms of mental health as well as protection from and reporting of harassment and abuse.

For this module, there was very little feedback submitted regarding how the content of the module could be improved. The majority of respondents replied with *"none"* or *"n/a."* From the limited data available, only one theme was found. Participants wanted additional, specific, examples of when to utilize resources or when to apply specific policies in a given situation. This was illustrated by the following statements: *"provide a specific example that you could see arise during a lecture where the instructor should contact the course director"* and *"I was not familiar with university policy to ensure clear boundaries between faculty and students and how to address this issue."*

3.2.4 Module 3

The content in Module 3, Communication Skills, centered around promoting active listening, providing useful feedback, and describing ways to create an inclusive learning environment. One significant theme, awareness, and one minor theme, quality feedback, were identified as being helpful to the participants. Nearly every participant stated this module raised their awareness of inclusive terminology, the need for inclusion in the curriculum, and the concept of microaggressions. Several comments, such as these, highlight the themes: *"The definitions of terms were helpful and corrected my understanding of the various gender terminologies"; "never heard of a microaggression before"; "awareness of the unconscious assumptions we make."* Regarding feedback, participants felt they had a better understanding of the components of helpful feedback in the educational setting.

Very little critical feedback was offered for this module. The majority of respondents replied with *"none"* or *"n/a."* Of the feedback given, participants requested more specific examples of methods for inclusion in educational materials and more examples of what constitutes a microaggression.

3.2.5 Module 4

Module 4 focused on Professionalism and Role Modeling. This module discussed adherence to the PA Profession's Guidelines for Ethical Conduct, the concept of self-care, and the characteristics of compassion fatigue and provider burnout. The themes found to be helpful to the participants were professional identify formation and awareness of compassion fatigue/burnout. Participants were previously not aware of the intentional integration of professional identify

formation as a component of the education of PA students. One participant remarked, "…modeling professional behavior, I think it's always a good reminder that we need to be good examples to students."

The majority of participants expressed the usefulness of the content surrounding the recognition of, and strategies to mitigate, compassion fatigue/burnout in PA students and practicing PAs. There were many comments similar to this one, *"... the importance of teaching students about needing to take time for self-care during their careers. That is rarely taught, and I learned it late in my career."* Another participant found the content to be personally useful stating, *"I didn't even realize there was a term for compassion fatigue, this is something I have experienced myself."*

There were few comments regarding how the content could be improved. All of the comments provided were suggestions to include more content on burnout. The participants specifically asked for more information on how to treat or mitigate burnout in practicing PAs.

4.0 Learning & Actions

4.1 Discussion

Our problem of practice is that clinically practicing PAs are not adequately prepared to function effectively as instructional faculty in PA programs. There is a great deal of support for full-time principal faculty members who teach in PA programs, but there is no standardized orientation or faculty development programs for part-time or casual instructional PA faculty members. Instructional faculty are a valuable asset to PA programs. They often have medical experience or a skill set not possessed by principal faculty. Literature surrounding the use of adjunct (instructional) faculty in professional programs supports the idea that, although qualified in their fields, they have not had formal preparation to teach in higher education or function in faculty roles within the setting of academia (Forbes et al., 2010; Glicken, 2008; Santisteban & Egues, 2014; West, 2010).

Our change idea was to develop online educational modules for instructional PA faculty to help close the gap between clinical expertise and educational inexperience. This idea is supported by literature that reveals adjunct faculty have expressed a desire to improve their skills and their feeling of connection to the training program in the form of a more robust orientation or formal educational seminars (Forbes et al., 2010b; Hurst, 2010; Santisteban & Egues, 2014b). In other professional fields, workshops covering basic concepts of pedagogy, faculty roles regarding syllabi and assessments, concepts surrounding student communication, and even the general culture of higher education have been recommended (Forbes et al., 2010; Glicken, 2008; Santisteban & Egues, 2014; West, 2010).

To determine which topics would be relevant to the orientation of instructional PA faculty, we sought concepts that would constitute best practice. In the fall of 2018, the PAEA developed PA Educator Competencies designed for PA faculty (Zaweski et al., 2019). We reduced this comprehensive list of competencies meant for principal faculty to those that would have the most impact for instructional faculty, and ultimately on student learning. We developed and launched 4 online orientation modules for our instructional PA faculty.

We developed three inquiry questions to study the results of our change idea. First, we assessed if the online modules were effective in improving the participants' content knowledge for each module. Our pre and post testing confirmed this improvement. Our project demonstrates the effectiveness of online learning modules on the improvement of content knowledge for instructional PA faculty. Additionally, we met our target prediction of post test scores improving by 20%.

The second inquiry question asked the IPAF to rate the effectiveness of the online module format. Our benchmark for the effectiveness score was a 3.5 out of 5, we predicted the IPAF would meet this benchmark. The mean rating was found to be 4.6 out of 5. This demonstrates the significant degree to which the IPAF agreed that the online format was effective.

The third inquiry question asked the IPAF to describe their perceptions of the content and format of the online modules by commenting on the strengths and opportunities for improvement from their perspective. Regarding format, we predicted the IPAF would respond favorably to the convenience of the asynchronous format, but that they would respond unfavorably to the lack of interaction with the presenters. These predictions were confirmed through qualitative analysis. These were the two main themes that were identified by the participants regarding the format of the modules.

Conversely, there was great variation in the participants' perception of the module content. Increased awareness was one of the main themes identified. Consistently, the participants' remarked on newfound knowledge as a result of the modules. The most considerable theme in areas for improvement surrounded the participants' want for more content across all modules. This shows us that there is a desire for more faculty development on the part of the IPAF.

To summarize the key findings, the online module format for orientation of IPAF was effective in improving content knowledge. It was well-received by those who participated and was effective in generating the understanding of new knowledge. Although designed to be a brief orientation for IPAF, there was significant interest in the content which would suggest a need for, and support of, additional instructional faculty development initiatives in the future. Because we were able to meet our improvement benchmarks, we can infer that our system would be positively affected by instituting these orientation modules and ultimately meeting in the orientation requirement accreditation standard as outlined in the driver diagram, allowing for a positive impact across the entire organizational system.

This project also positively impacted our organizational system and its stakeholders. We, in our roles within the system, were able to affect positive change through this project. As Program Director and Director of Didactic Education, we are able to direct the implementation of this project as part of our leadership roles. Previously, the orientation of IPAF was haphazard, not grounded in best practice, and left to the varied methods of each principal faculty member. We were able to create a standardized and streamlined process supported by the competencies developed by our professional organization. The deployment of these modules has also assisted us in our integral roles in the accreditation program self-assessment process. We were able to meet

the accreditation standard of orientation of instructional faculty in a way that is effective and measurable.

Additional stakeholders include faculty in the program, both principal and instructional. Because of this project, instructional faculty received a quality orientation to their role in the program. The principal faculty were not burdened by the additional duty of orientating instructional faculty and could enjoy the benefits of working with instructional faculty that are more prepared for their roles. This reduction in workload also allowed the principal faculty member to focus on their primary job functions of teaching, scholarship, and service.

PA students, as stakeholders, will also benefit from the implementation of this change idea. Students will receive improved and reliable quality of instruction from all faculty, whether principal or instructional faculty. Students can feel confident that they are being taught by qualified faculty who have been oriented to best practices in PA education. Ultimately PA students are positively affected because programs who offer high-quality education remain accredited more easily. Students must graduate from an accredited program to be eligible for their national board exams which are required for licensure and future practice.

We identified several limitations of this process. First, we had a lower-than-expected participation rate which ranged from 34.7% to 39.6% of our target audience. We anticipated a lower than desired response rate because participation in this activity was not mandated. Also, our participants are all full-time clinically practicing PAs who are currently providing medical care in the midst of a global pandemic. The time commitment and stress level associated with their clinical work may have made our request less feasible. Anecdotally, after the window of time for module completion closed, we had a few people contact us to express their support of this project but stated they were not able to fit it into their schedule due to work obligations.

A limitation we did not expect was that there were some technical issues participants had while navigating the modules in the CME platform. Thankfully, we had excellent technical support from the CCEHS office and were able to help participants resolve these issues quickly. These difficulties did not prevent participants from completing the modules.

4.2 Next Steps & Implications

Our next step will be to integrate participant feedback and our own learnings from this process into an updated iteration of the modules. This project will result in a change in program policy. We plan to update our current IPAF onboarding process to include these modules as a requirement for all new IPAF. Additionally, we will require any current IPAF who have not yet completed the modules to do so.

Based on test performance and qualitative feedback, we plan to expand some module content and provide additional faculty development opportunities in two specific areas for the second iteration of our PDSA cycle. The first is diversity, equity, and inclusion. Based on the range of pretest scores with a low pretest average for Module 3 and qualitative feedback expressing a low level of awareness of these concepts, we will offer additional faculty development content in the area of diversity, equity and inclusion in the setting of medical education.

The second area in need of additional content and resources is that of compassion fatigue and burnout in students and providers. The qualitative data revealed a low level of previous knowledge in the area of provider wellness. Data also suggested that IPAF were experiencing rampant compassion fatigue and burnout. They lacked self-awareness and awareness of these

concepts prior to completing the module. We will offer additional resources to IPAF in this area as well.

These modules were designed to be an initial overview of applicable educator competencies for new instructional faculty. We have found them to be effective, and our IPAF requested more in-depth information. We plan to develop additional modules with more advanced content for experienced IPAF.

Lastly, we plan to incorporate these modules into our Learning Management System (LMS) where we will be able to house the modules, links to resources/policies, and supplemental materials. This resource will create an interactive learning community in which IPAF can complete faculty development modules, read and post articles, and participate in discussion boards if they choose. In the review of supporting knowledge for this project, we learned instructional faculty in professional programs across disciplines identified the need for written guidelines or a handbook, and consistent guidance regarding policies and common educational practices to sustain them beyond their initial orientation (Forbes et al., 2010; Santisteban & Egues, 2014).

We have sufficient evidence to conclude that online learning modules may be an effective way to adequately prepare clinically practicing PAs to function effectively as instructional faculty in PA programs. The deployment of online learning modules meets the orientation accreditation standard which concludes this initial PDSA cycle. It is our hope that future iterations of these efforts will not only satisfy the accreditation requirement but will also result in improved future teaching effectiveness ratings as determined by our program's self-assessment process. Ultimately, improved teaching effectiveness will fulfill the work of one of our identified drivers. This driver will positively impact our aim statement as presented in our driver diagram: By the

next ARC-PA self-study in 2022, 90% or more of instructional faculty will be at or above the defined benchmark in the area of teaching effectiveness.

5.0 Reflections

5.1.1 Reflections on the Improvement Process

We are both trained as clinicians. We practice medicine. We are trained to make quick decisions and to solve problems. This is not the best strategy to use when practicing improvement science. A quote from one of the texts we read in our very first EdD semester illuminates this point. Bryk, Gomez, Grunow, LeMahieu (2015) state, *"When a problem presents itself, it is natural for people to formulate a solution based on their past experiences, professional knowledge, and beliefs about what seems appropriate"* (p. 24). We quickly learned we needed to put our previous skill set aside and embrace a new way of thinking about and solving problems.

First, we learned we must truly understand the problem, not just our interpretation of the problem. Our perspective of what is "wrong" is not complete and is not any more valuable than the perspective of others. This level of understanding is especially important when one holds a leadership role. A disciplined inquiry is necessary. We learned the importance of stakeholder assessments, creating actionable statements of a problem, and the need to examine the whole system when contemplating a problem and developing a potential solution.

The process of improvement can be tedious and time consuming when done correctly, which the very nature of improvement science encourages. It takes away the temptation to make a quick decision that may be ineffective at best, or at worst, adversely affect stakeholders. Reviewing existing scholarly knowledge is part of the thoughtful investigation into the root of the problem as well as potential solutions that have been effective in other circumstances. These ideas, once new and awkward for us, are now part of the way we approach all problems. These methods

have become established professional practice for us in the places where we work, learn, and serve. Best practices in this form of scholarly inquiry will have long lasting effects not only on us as practitioners, but also on our organization.

Not only did we develop a better understanding of the improvement science process, but we also developed new knowledge surrounding how to operationalize our project. We learned the importance of buy-in from others who are involved in the problem area but may not have a full understanding or awareness of the need for improvement. We learned that, although we were both passionate about our project, not all of our stakeholders shared our enthusiasm. We provided more information about the problem and the stakeholders perceptions of the project were more favorable which resulted in more willing to assist us with moving the project forward. Stakeholder support is imperative for the sustainability of an improvement science project.

All improvement science projects will have obstacles. A successful scholar practitioner accepts this and is prepared to identify and address obstacles as they arise, realizing obstacles are inherent to the process and not signs of failure. We encountered this in our project. Some obstacles we anticipated never materialized, and some we did not anticipate occurred.

Even failure itself is not something to fear in improvement science. Quick action with calculated risk, grounded in scholarship, is far superior to being incapacitated by non-action or over planning. The iterative nature of improvement science allows us and encourages us, to just simply try, to change course when indicated, and to accept all outcomes knowing that even the less desirable ones can be the foundation of what will become substantial positive change.

We will take this level of understanding with us as we move forward in our leadership roles within our organization. Much of what we do administratively focuses on program assessment and improvement. We have also developed new skills in the areas of measurement of outcomes and

significance of change. We learned the importance of driver, process, outcome, and balance measures and how changes impact these measures and our organizational system. We were not familiar with many of these measures when we began the EdD program, or how to incorporate them into an improvement science project. Throughout the course of our work, we learned that not only are these measures valuable from an organizational impact standpoint but also that they need to be continuously monitored as the project continues. Throughout this improvement science project, we, as leaders, now understand that iterative processes are valuable, and failures are formative.

5.1.2 Reflections on the Joint Dissertation Process

While we completed the dissertation in practice project together and wrote the document together in real time over Zoom Video Communications, Inc.©, we wrote the reflections separately. After inserting them into the document we read them together synchronously. We were not surprised to see how similar they were.

Once we overcame the initial period of adjustment and developed a system for how to work with each other on this crucial project we realized having the support of each other was well worth the initial effort. We strongly recommend all EdD students consider the joint dissertation. It does not only provide the opportunity to achieve the competencies necessary for program completion but also affords students the chance to develop additional skills that will be useful in the future, particularly in the areas of communication and project management. A joint dissertation does not devalue the academic rigor but instead affords students the ability to collaborate on a project that is much larger and more impactful than one person could accomplish alone.

5.1.2.1 Allias Reflection.

Three years ago, when I enrolled in the EdD program I had no intention of completing a joint dissertation in practice. In fact, I did not even know the concept existed. Now, looking back on the process I realize how fortunate I am to have had this opportunity. A joint dissertation is well-suited to the realm of improvement science, and it is really the perfect demonstration that one has acquired the skills necessary to be a Change Agent.

This joint dissertation offered me the chance to showcase the skills necessary to work as a scholar-practitioner. Not only did I have to master the concepts surrounding problems of practice, theories of improvement, and applied inquiry, but I had to do all of those things - and more - while working collegially with another person. The opportunity to complete a joint dissertation builds leadership skills and the capacity for interdisciplinary work. These are critical elements necessary for leading organizational change. This type of collaborative work is representative of what we will be expected to do after graduation in our places of practice.

I was also very fortunate to be able to work with my colleague and friend, Emily. A project of this magnitude has the potential to create significant interpersonal challenges. Thankfully, there were a lot of factors that supported our success in this endeavor. Emily and I have worked together for the last 10 years in the same department, we have taught together, presented at professional conferences together, and survived program accreditation visits together. We have similar work styles, and we approach project planning in the same way.

This experience was not without its challenges. At times, we found it necessary to allow space to accommodate each other in terms of professional and personal obstacles and surprises. There were definitely a few of those throughout this process! In moments of uncertainty or

disagreement, we were honest and open enough to give and receive feedback knowing that we shared a common goal.

Although I did not anticipate completing this dissertation in practice as part of a team, I am so grateful that Emily was my teammate. Her intelligence and work ethic are admirable, and her sense of humor definitely got us through some of the rougher spots. To have colleague and friend of Emily's caliber is rare, and to have the experience of working with her on such an important project was one of the honors of my career.

5.1.2.2 Murphy Reflection.

In order to reflect on the joint dissertation of practice, I have to begin by reflecting on how that process even started. My original project, which surrounded prospective PA student shadowing, was indefinitely suspended due to the pandemic because all student shadowing experience were placed on hold. When I realized this situation, I immediately began to panic. How would I complete my project on time? Fortunately, Mary and I have always had a solid working relationship and I approached her with my situation. She was very receptive to the idea of a joint dissertation and we were able to proceed on this journey together.

While I had a lot of experience with Mary's problem of practice, it was certainly not my own idea, so that first step was to learn about her entire process. There was a definite learning curve with trying to get into the mindset surrounding her project when I had already been so invested in my own. As we worked together all if this subsided and we were able to move on with the joint project without any issues. In fact, I would say that the project turned out better as an overall change idea because, since there were two of us, we were able to create more modules and collect more data surrounding the change project.

Since Mary and I already had already worked on many projects together, we were used to each other's work styles, which have always meshed very well. We both have our own strengths and weaknesses, and we were able to assign duties and pieces of the project to work within those strengths. We were also able to overcome many obstacles throughout the process by working together. It was extremely useful to have someone as a partner. When one of us would hit a roadblock, the other was there to get us back on track. Having a supportive partner on this project has been invaluable. I look forward to working with Mary not only on future iterations of this project but on many others as we continue our careers in the Pitt Department of PA Studies.

Appendix A Fishbone Diagram

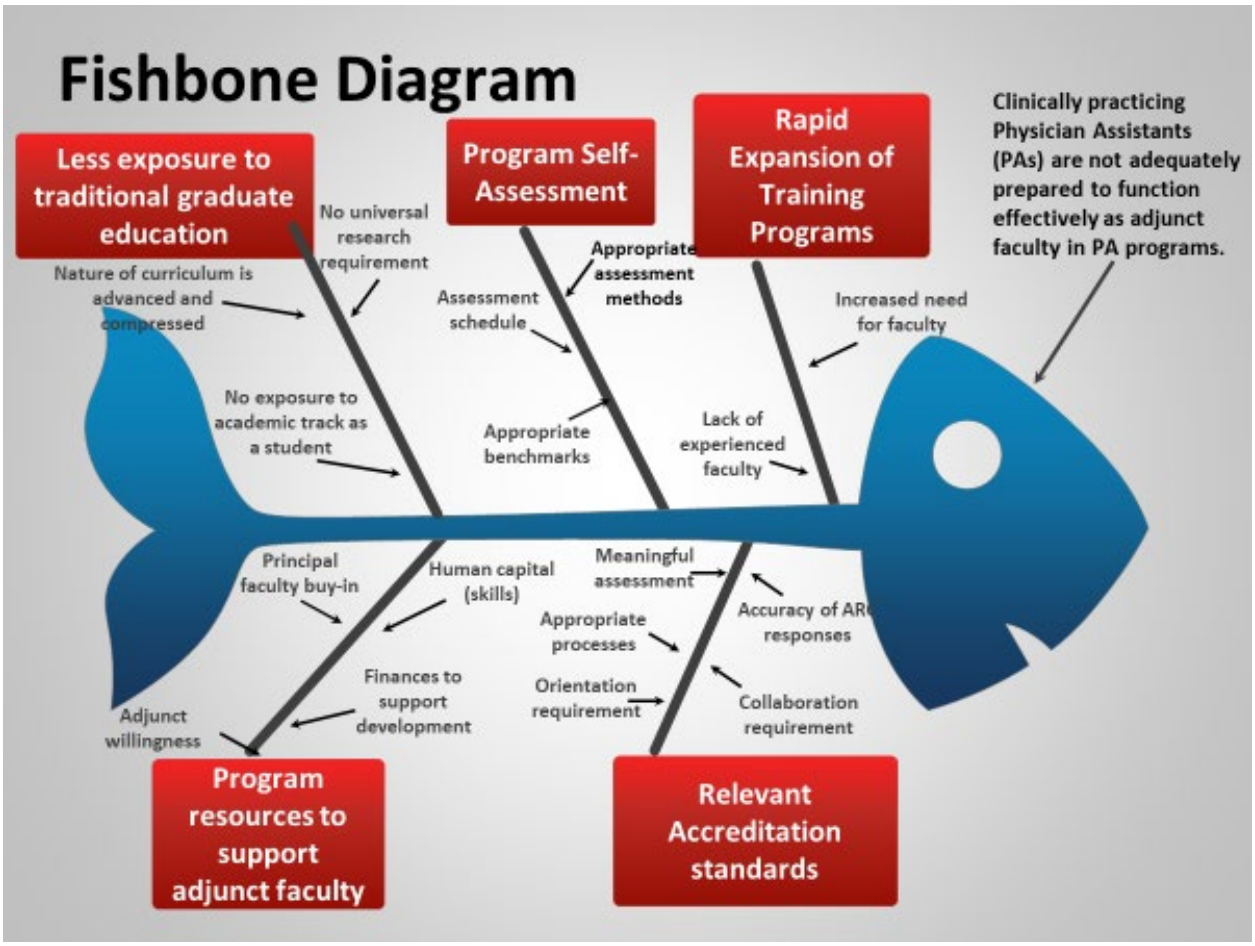

Figure 3. Fishbone Diagram

Appendix B Driver Diagram

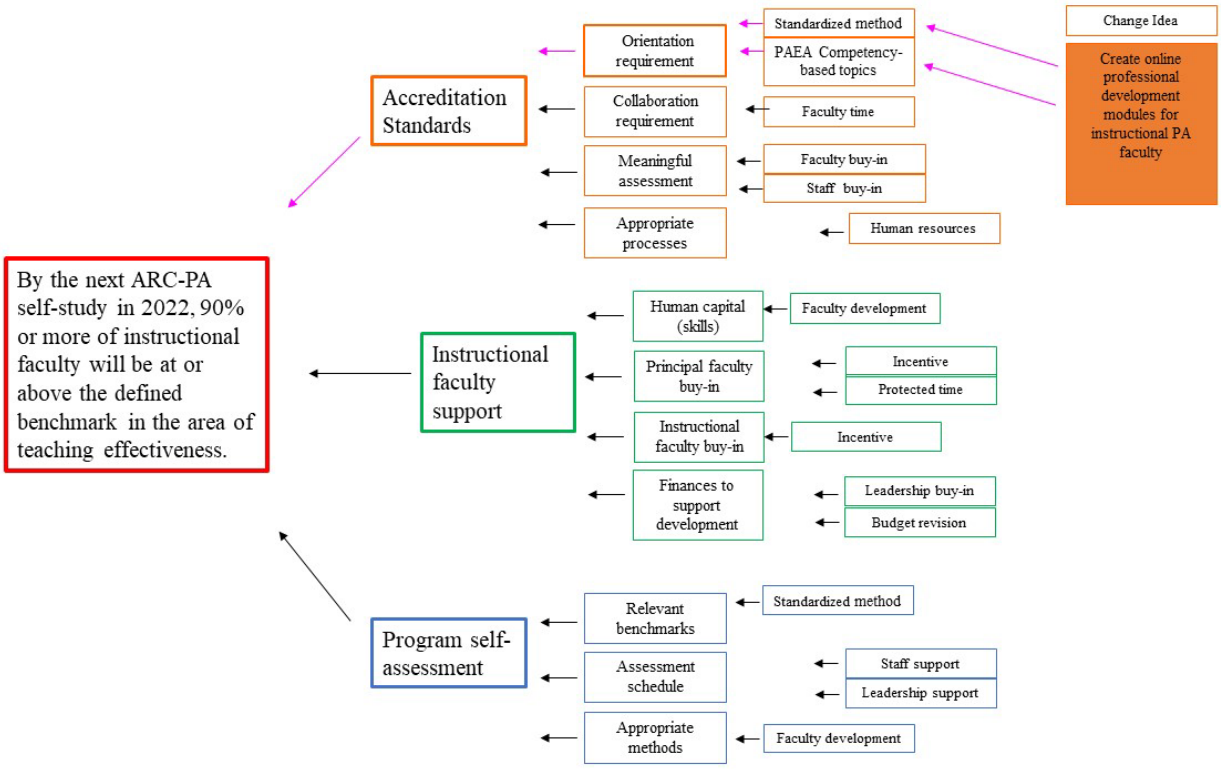

Figure 4. Driver Diagram

Appendix C PAEA Educator Competency Domains

Appendix C.1 PA Educator Competencies

Appendix C.1.1 Teaching

Teaching

Utilize learning educational theory and evidence-based literature to design teaching and evaluation practices that challenge and facilitate learners to practice high quality, compassionate patient care.

1.1 Demonstrate content knowledge in area of expertise to help learners apply the established and evolving knowledge needed for effective patient care.

1.2 Demonstrate the ability to develop a cohesive and well-coordinated course based on clear course goals, objectives, and outcomes that support the program mission and goals.

1.3 Using valid methods, assess learner progress in acquiring knowledge, skills, and attitudes aligned with the stated course goals and objectives.

1.4 Provide, select, and recommend resources to supplement and enhance learners' understanding of medical knowledge. Promote learner autonomy in identifying resources and support.

1.5 Identify and use internal and external resources to improve medical education, advocate for learners, and provide optimal teaching and learning.

1.6 Design learning experiences and opportunities that use a variety of instructional methodologies that cultivate critical thinking skills.

1.7 Reflect during and after educational interactions and actively seek input and feedback about the quality and effectiveness of teaching from multiple sources, including learners.

1.8 Use feedback and self-assessment to identify teaching strengths and weaknesses in order to modify techniques and improve educational outcomes.

1.9 Recognize and utilize the concepts of interprofessional education.

1.10 Demonstrate proficiency in computer skills and instructional technology.

Learner-Centeredness

Demonstrate a commitment to learners' success, well-being, and growth into the professional role.

2.1 Demonstrate respect, sensitivity, and responsiveness for each learner, as an individual, being mindful of privacy, autonomy, diversity, and professional boundaries.

2.2 Value all learners' contributions to the learning environment to stimulate learner responsibility and facilitate cooperation and collaboration.

2.3 Invest in each learner's growth and skill development, being cognizant of the learner's prior knowledge and unique needs in order to overcome barriers and provide feedback to improve learning.

2.4 Identify competing demands and factors that may cause stress for each learner.

2.5 Provide educational and wellness support by connecting the learner to the appropriate resources within the educational community.

Communication Skills

Employ effective communication styles.

3.1 Engage in active listening, foster open dialogue, and participate in problem solving as a member of a team.

3.2 Facilitate dialogue and understanding, especially during times of conflict.

3.3 Understand and identify how diversity and inclusion influence communication styles and impact professional relationships.

Professionalism and Role Modeling

Demonstrate appropriate professional behaviors inspiring excellence in learners and peers.

4.1 Adhere to ethical principles demonstrating compassion, integrity, and respect.

4.2 Model professional practice standards including, but not limited to, maintaining appropriate licenses, credentials, and faculty development activities.

4.3 Develop and implement professional goals based on continuous self-assessment.

4.4 Exercise an awareness of stressors that may negatively impact personal and professional well-being; access appropriate resources.

4.5 Participate in service activities that are connected to the profession or the institution's mission.

4.6 Collaborate with other health professionals to promote and maintain a climate of mutual respect.

4.7 Participate in continuous professional development.

Program and Curriculum Design and Implementation

Design and implement sustainable educational programs.

5.1 Apply major theories of education in program design and implementation and seek additional training to stay abreast of educational best practices.

5.2 Use a deliberate, thoughtful approach to curricular development, being cognizant of advances in instructional modalities and emerging technologies.

5.3 Anticipate how societal, medical, and educational trends may affect the profession and plan for curricular innovations to address those needs.

5.4 Conduct needs analyses and craft and prioritize learning goals and objectives that support defined professional competencies with input from institutional expertise, including content, delivery, and technology experts.

5.5 Invest in staff and faculty training to facilitate specific programming.

5.6 Anticipate implementation barriers, such as lack of institutional support, and develop a plan to address these challenges involving key stakeholders.

5.7 Ensure program relevancy by revising curriculum based on outcomes and feedback from internal and external stakeholders.

5.8 Begin succession planning during implementation to ensure continuity if a key educator becomes unavailable.

5.9 Provide timely feedback to key stakeholders to ensure accountability and to encourage collaborative innovation.

5.10 Provide learners with graduated responsibilities based on their abilities.

Program Evaluation

Use scholarly and practical approaches to ensure program evaluation in a way that creates new knowledge about the program and the process.

6.1 Implement established quality improvement techniques.

6.2 Employ valid outcome measurements to determine need for curricular improvement.

6.3 Ensure continuous program evaluation by key stakeholders.

6.4 Identify evaluation modalities most likely to capture key learning outcomes.

6.5 Identify questions unanswered by program implementation and evaluation and plan for next steps.

6.6 Understand accreditation standards and apply them to the curriculum.

Scholarship Development

Participate in scholarly activities that promote the profession, build its body of knowledge, and build academic capital for promotion and tenure.

7.1 Participate in professional societies and network with peers.

7.2 Design and implement research and scholarly activities within an established area of expertise.

7.3 Demonstrate skill in proposal writing for initiatives that include, but are not limited to, research, resource acquisition, program development, and policy development.

7.4 Communicate research results to professional audiences by peer-reviewed abstracts, posters, oral presentations, and publications.

Leadership

Create a collaborative culture that inspires others to embrace a shared vision.

8.1 Inspire commitment and vigorous pursuit of a clear and compelling vision, stimulating higher performance standards.

8.2 Anticipate future changes in medicine, population health needs, society, and education that will affect the profession.

8.3 Recruit, develop, and retain the next generation of educational leaders and actively engage in succession planning.

8.4 Create and promote opportunities for faculty and staff that lead to skills development and leadership roles.

8.5 Create a system that recognizes and rewards those who meet or exceed goals and remediate those who do not meet appropriate benchmarks.

8.6 Create and sustain organizational systems that are resilient, flexible, capable of change, accountable, and balanced between stability and growth.

8.7 Articulate an understanding of administrative, legal, and financial structures of the program and institution and of the external organizations that govern medicine and research.

8.8 Manage budgets and resources to achieve programmatic goals and raise funds from internal and external sources, concordant with institutional values.

8.9 Create a culture of safety and trust in which feedback is encouraged and used to evolve programs.

8.10 Demonstrate proficiency in accreditation standards and maintain a system to ensure proper documentation.

Mentorship

Sustain a positive focus on professional growth of individuals (learners, faculty, and staff) in order to optimize potential.

9.1 Articulate expectations of the mentor-mentee relationship.

9.2 Provide support and encouragement for individuals to develop needed skills through collaboration, feedback, and apprenticeship.

9.3 Advocate for mentees, by identifying and creating key networking opportunities.

9.4 Identify or develop resources for individuals to prepare them for professional success.

Appendix D Protocol for Inquiry Question 1: Did the Participants' Content Knowledge Improve?

Module 1, pre and post questions:

1. An educational objective is

    a. A statement describing knowledge or skills a student will have after completing a lesson*
    b. A way to assess knowledge learned in a lesson
    c. A description of course content that does not need to be published for students or measured
    d. A blueprint for the methods you will use to teach a lesson, commonly known as a lesson plan

2. What is one way to assess if an educational objective was met?

    a. By surveying the students on the quality of teaching in a course
    b. By structuring the objective with an appropriate verb
    c. By using Bloom's Taxonomy to create the objective
    d. By linking the objective to a course assessment*

3. Which of the following levels of Bloom's Taxonomy requires the highest level of learning/cognition?

    a. Knowledge
    b. Synthesis*
    c. Comprehension
    d. Analysis

4. You are teaching a clinical reasoning session to PA students. What is one way in which you can help them apply the knowledge they learned during lecture?

    a. Assign readings from the text
    b. Create practice test questions
    c. Present a clinical case*
    d. Ask recall level questions

5. One of the Department of PA Studies Program Goals is to “Graduate skilled Physician Assistants who practice patient-centered care”. Which of the following courses would help support that goal?

    a. Patient Education and Counseling*
    b. Physiology and Pathophysiology
    c. Genetic and Molecular methods of Health and Disease
    d. Human Anatomy

Appendix E Protocol for Inquiry Question 1: Did the Participants' Content Knowledge Improve?

Module 2, pre and post questions:

1. Learner-centered teaching includes consideration of how the student is learning. Which of the following concepts would be an indicator of this consideration?

    a. Is the content guided by educational objectives?
    b. Is the content provided via traditional lecture or case-based?*
    c. What skills can we cultivate to ensure life-long learning?
    d. What impact does the stress of the didactic year have on their learning?

2. Which of the following is a federal law developed to keep the educational environment free from sexual discrimination?

    a. Equal Rights Act
    b. FERPA
    c. HIPAA
    d. Title IX*

3. The Family Educational Rights and Privacy Act (FERPA) protects

    a. Students against discrimination based on biological sex
    b. The privacy of student of medical records
    c. The privacy of student education records*
    d. Students against sexual misconduct in the educational environment

4. Who has the primary responsibility to maintain ethical relationships between faculty and students?

    a. Faculty*
    b. Students
    c. University Administration
    d. Pitt Police

5. When is it appropriate for a faculty member to participate as a health care provider for a student?

    a. Routine medical care
    b. Surgical care
    c. Immunization clinics
    d. Emergency situations*

Appendix F Protocol for Inquiry Question 1: Did the participants' Content Knowledge Improve?

Module 3, pre and post questions:

1. Listening skills that help others open up and elaborate on what they are saying are generally known as

    a. Therapeutic listening
    b. Active listening*
    c. Courtesy
    d. Empathetic listening

2. For feedback to be effective students must

    a. Know the educational objectives
    b. Be engaged below their level of learning
    c. Understand how their work compares to good work*
    d. Merely hear the exchange of information

3. What is the definition of gender identity?

    a. How someone conveys their gender
    b. A socially constructed identity that is associated with how people act, dress and behave according to the defined social norms
    c. A pattern of romantic and/or sexual attractions to people of the same gender, a different gender, multiple genders
    d. A person's understanding of themselves in a gendered category*

4. Which of the following considerations will help create an inclusive learning environment?

    a. Present material from only your perspective
    b. Students who represent a minority can give the perspective of that group
    c. Deliver content that incorporates people of color and LGBTQ people*
    d. Assume students will speak up if they feel marginalized

5. “A statement, action, or incident regarded as an instance of indirect, subtle, or unintentional discrimination against members of a marginalized group such as a racial or ethnic minority” is the definition of:

    a. Xenophobia
    b. Microaggression*
    c. Microinsult
    d. Racism

Appendix G Protocol for Inquiry Question 1: Did the Participants' Content Knowledge Improve?

Module 4, pre and post questions:

1. Why do legal standards and ethical obligations not always align?

    a. The law describes the minimum expected standard for behavior*
    b. Ethical obligations vary within a profession
    c. The law is a social construct
    d. Ethical obligations describe the minimum expected standard for behavior

2. Which of the 4 main bioethical principles means "to do no harm, to impose no unnecessary or unacceptable burden upon the patient?"

    a. Autonomy
    b. Beneficence
    c. Nonmaleficence*
    d. Justice

3. Which of the following is a way we deliver professional development content in the classroom?

    a. Inclusion of an honor code
    b. Modeling*
    c. Preceptor evaluations
    d. Use of a demerit system

4. "The natural behavior and emotion that arises from knowing about traumatizing events experienced by a significant other, the stress resulting from helping or wanting to help a traumatized person" is

    a. Burnout
    b. Self-Care
    c. Compassion fatigue*
    d. Emotional exhaustion

5. Monitoring media consumption is a form of:

    a. Shirking your civic duty
    b. Burnout
    c. Empathy
    d. Self-Care*

Protocol or Inquiry Question 2: How effective is the online module format as an instructional method?

APPENDIX Bor Inquiry Question 2: How effective is the online module format as an instructional method?

Appendix H Protocol for Inquiry Question 2: How Effective is the Online Module Format as an Instructional Method?

Likert Scale:

Strongly Agree = 5; Agree = 4; Undecided = 3; Disagree = 2; Strongly Disagree = 1

Reflect on your experience taking this online module. Please rate your level of agreement with the following statements regarding this module:

1. The module was well organized
2. The online format was appropriate for this topic
3. The online format held my attention
4. The level of effort required to access the online module was acceptable to me
5. Overall, the online module format is an effective instructional method

Appendix I Protocol for Inquiry Question 3: What Are the IPAF's Perceptions of the Module Delivery Method and the Value of the Content Contained Within?

Open-ended questions with free text response boxes:

1. Please describe at least one strength of the online module format
2. Please describe at least one way in which the online module format could be improved
3. Please list at least one topic contained within this module that is most helpful to you as an educator
4. Please describe at least one way in which the content contained within this module could be improved to be more helpful to you as an educator
5. Please compare this online CME module to live, in-person CME courses/lectures. Which do you prefer and why?

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