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Inquiry as Practice for Continuous Improvement: A Framework for the Curricular Redesign of the Education Doctorate in Curriculum and Instruction Research Continuum at the University of Central Florida.

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INQUIRY AS PRACTICE FOR CONTINUOUS IMPROVEMENT: A FRAMEWORK FOR THE CURRICULAR REDESIGN OF THE EDUCATION DOCTORATE IN CURRICULUM AND INSTRUCTION RESEARCH CONTINUUM AT THE UNIVERSITY OF CENTRAL FLORIDA

by

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ABSTRACT

This design-based research study was conducted at the University of Central Florida with the aim of informing the Education Doctorate in Curriculum and Instruction research course sequence within the College of Education and Human Performance. The main purpose of this dissertation was to enhance and enrich the Ed.D. in Curriculum and Instruction research continuum courses to ensure that they support the use of applied research and practical theory as central to the development of scholarly practitioners. In order to fulfill its purpose, this study addressed three main goals: clarifying the Ed.D. in Curriculum and Instruction program goals, objectives, and research continuum learning outcomes; developing research course sequence curriculum maps; and redesigning sample curriculum units for individual research courses.

The curriculum mapping and redesign process was supported by research-based design choices in alignment with the practice-oriented nature of the program. These design choices included the Carnegie Project on the Education Doctorate Working Principles and Design Concepts, in particular the use of Inquiry as Practice as the main redesign framework in combination with improvement science principles. These frameworks were first used as foundations to clarify the Ed.D. in Curriculum and Instruction program goal and overall objectives. Later, user-centered design principles were applied to create faculty and student personas in order to inform the redefinition of individual research course learning outcomes. In addition, the frameworks were used to create alignment matrices and demonstrate where they supported each of the program objectives. This iterative process was carried out simultaneously

with the course curriculum map redesign for each of the research continuum courses using backward design principles, the spiral curriculum model, and taking into consideration the most suitable instructional modality for learning outcomes, including the best suited education technology choices. Further, some proposed sample course units were developed in greater detail utilizing Universal Design for Learning principles and the prioritization of learning outcomes. Course contents were selected based on cognitive and reasoning learning theories pertaining to mixed method courses for professional practitioners.

The developed prototypes support the continuous Ed.D. in Curriculum and Instruction curriculum redesign efforts of the program and College of Education and Human Performance at the University of Central Florida and clearly distinguish the Ed.D. in Curriculum and Instruction program from traditional, research-based doctorates. Similarly, at the national level, this study also sought to benefit other CPED-influenced professional practice programs, as they also consider the careful redesign of their research or inquiry sequences to define their programs as ones that fully address the needs of advanced professional educators. Acknowledging the limitations of this study, further studies should identifying the motivational, cognitive, and organizational causes affecting student learning outcomes. Implementing and evaluating the prototypes developed to ensure their effectiveness in preparing scholarly practitioners to act as agents of change in their professional practices.

To Ken, my wonderful husband, who always walks by my side and holds my hand no matter how bumpy the road may get: Thank you for your unconditional love, support, and patience. You are my always and forever.

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CHAPTER ONE: INTRODUCTION

<u>Problem of Practice</u>

Purpose Statement

Given that Inquiry as Practice preparation relies on the ability of advanced professional educators to collect, analyze, and evaluate literature and data to innovatively solve complex problems of practice (CPED, 2015a, 2015c), the purpose of this Dissertation in Practice is to ensure that the Doctor of Education (Ed.D.) in Curriculum and Instruction research course sequence at the University of Central Florida (UCF) supports the use of applied research and practical theory as central to the development of scholarly practitioners.

Rationale

The Carnegie Project for the Education Doctorate (CPED), a consortium of approximately 80 colleges and schools of education, came together in 2007 to collaborate to critically examine and share best practices and experience with the ultimate goal of redesigning the professional doctorate of education (Ed.D.). This reform would not only improve the Ed.D. program's efficacy and reliability for the advanced preparation of scholarly practitioners but also address continuous arguments regarding the rigor, validity, and function of the Ed.D. program when compared to the well-accepted Ph.D. program (CPED, 2015c; Deering, 1998; Rueda, Sundt & Picus, 2013). CPED (2015a) described scholarly practitioners as practicing professional educators or leaders who have the ability to amalgamate practical wisdom with professional skills and knowledge to name, frame, and solve problems of practice. Therefore, the professional

doctorate degree must be designed to provide substantial preparation that can lead to a transformation in the field of practice through the use of Inquiry as Practice (Bengston, Jones, Lasater, & Murphy-Lee, 2014; Perry, 2015). Accordingly, it is pivotal that the roles of applied research and practical theory remain central in the redesign of any Ed.D. program (Perry, 2015; Shulman, Golde, Bueschel, & Garabedian, 2006).

UCF has been an active CPED member since the inception of the initiative and consequently, has followed the CPED set of Design Concepts that represent the core components of the Ed.D. program as well as the set of Working Principles that frame program development (CPED, 2015c, 2015d). Given that CPED (2015c) emphasizes that Inquiry as Practice preparation is central to the ability of the scholarly practitioner to use data to understand the effects of innovation, it is crucial that the research course sequence in the Ed.D. program provide advanced professional practitioners with substantial research expertise that can be applied in their own professional practices. As such, UCF Ed.D. redesign initiatives have focused on developing a more practice-oriented program since its beginnings in 1982, focusing on research and inquiry (Boote, 2008).

As part of the ongoing Ed.D. reform efforts for continuous improvement, the program's core faculty requested that I conduct this study to enhance and enrich the existing research course sequence and further ensure that it provides advanced professional educators with the applied research skills necessary to solve complex problems of practice. Otherwise, graduates may fail to achieve the main goal of becoming more effective educators, only to be left with the struggle of applying learning to their contexts. Moreover, the lack of strong research and inquiry courses could negatively impact the organization in terms of reputation, decreased rigor, and student demand by failing to distinctly differentiate the professional doctorate program from the

research-based doctoral programs offered at the university. The logic model found in Appendix A provides a graphical depiction of the Ed.D. in Curriculum and Instruction components, and further explains the impact on the program and organization of having an aligned Ed.D. research course sequence.

Further analysis of how this problem of practice is related to other problems within the organization is needed. For instance, changing the Ed.D. capstone project to a Dissertation in Practice (DiP) format has led to problems of acceptance from other faculty members in the College of Education and Human Performance (CEDHP). The DiP does not follow the traditional five-chapter format that theory-based programs use; therefore, questions have been raised about the legitimacy and rigor of this capstone project as a symbol of competence to work as an independent scholarly practitioner at the doctoral level. Last, given that the Ed.D. program has been offered in the same manner for several years, the core faculty program also determined that would be appropriate to study the problem of practice at hand to verify whether the intended research course sequence outcomes are being met.

Organizational Context

The current professional doctorate at UCF is a cohort-based, 3-year program, which consists of three distinct program areas: core, concentration, and capstone. The program requires 21 credit hours of core courses, 15 credit hours within the chosen concentration area, and 18 credit hours of Dissertation in Practice, for a total of 54 credit hours beyond the master's level (UCF, 2015). The core includes a continuum of three research courses (see Figure 1, current Ed.D. research courses and their schedule) designed to identify, analyze, and evaluate complex problems of practice (UCF, 2015).

At present, EDF 7457, Data, Assessment & Accountability; EDF 7985, Proposing and Implementing Complex Problems of Practice; and EDG 7987, Dissertation in Practice are not considered part of the research continuum in the program catalog; however, it could be proposed that they be reclassified during the research course sequence redesign.
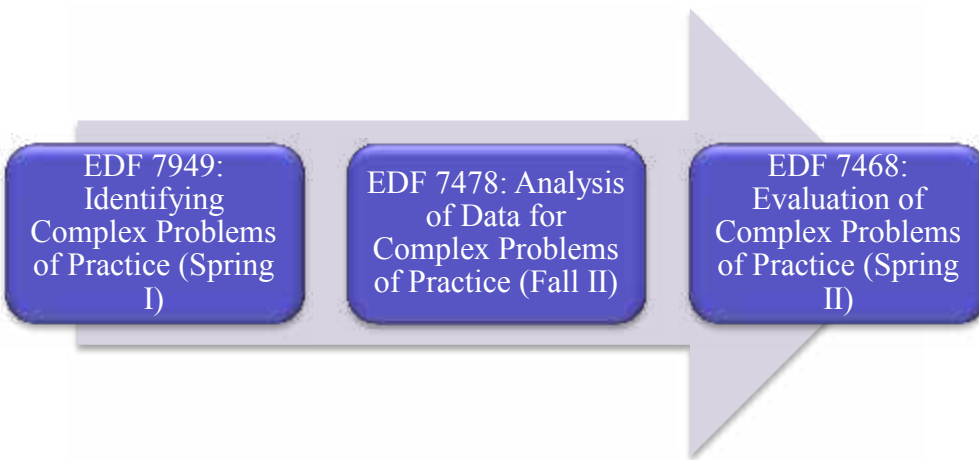
Figure 1: Ed.D. in Curriculum and Instruction Research Continuum Courses at UCF

In addition, the UCF Ed.D. in Curriculum and Instruction program has a lab of practice (LoP) component and three milestones that serve as formative assessments at the end of each year. Although other institutions offer formative assessments, or residencies and retreat-like experiences, the LoP offered at UCF has the potential to be extremely beneficial for students not only in terms of applying and learning more research skills that deal directly with problems of practice, but also to serve as formative assessments in combination with the milestone projects. Appendix B shows the program's first year activity flow chart, which was developed using a simplified version of the model presented by Malone et al. (1999) to depict how the first milestone serves as a formative assessment to demonstrate competency for continuation to the next program level. As such, it is evident that the research courses lead to this pivotal program juncture, serving as a checkpoint for both students and program faculty to ensure that successful

application of the research skills and concepts learned during the first year yield a solution to a complex problem of practice.

The research course component (EFD 7494) is shown in purple, and the blue-purple rectangle depicts the proposed core theory course (EDF 7457) to be integrated into the research continuum. Additionally, if students are not performing at the expected levels, the program advisor or faculty can devise a remediation plan for such students, or decide whether they should continue in the program. Moreover, students may also choose to leave the program on their own, if they feel if it is not the right fit for them, or if it is a challenge that they cannot undertake.

The second year activities chart would look very similar, having also two core theory courses, specialization courses, the next two research courses from the research continuum, (EDF 7478 and EDF 7468), as well as a second milestone and dissertation proposal course (EDG 7985). These would also be used in similar fashion in conjunction with student performance data as a formative assessment regarding the use of the acquired applied research skills and would also be used to grant students candidacy before entering dissertation hours.

<u>History and Conceptualization</u>

Local/Organizational

The original Ed.D. program at UCF approved in 1982 was introduced at the college before any Ph.D. degrees, thus serving as both a research-oriented and practice-oriented degree (Boote, 2008). The initial version of this program lasted four years and was very flexible, as it allowed students to specialize in any given master's area and to enter without a prior education degree. However, as Ph.D. degrees were introduced to the university and the CEDHP, the clear need of differentiating the programs was made evident (Boote, 2008). Despite changes since the program's inception in the educational landscape, together with social, economic, and political

changes that have altered the context for both K-12 and higher education, schools of education and related stakeholders have responded to these shifts by targeting graduate proficiency in their fields (Goldring & Schuermann, 2009). Consequently, the Ed.D. program at UCF maintained its flexible and broadly focused approach throughout the years (Boote, 2008; UCF Graduate Council, 2015).

A first program revision was introduced in 2006, when the program was renamed from Ed.D. in Curriculum and Instruction to the Ed.D. in Education program to reinforce the program's broader intent and options for multiple areas of specialization (Boote, 2008; UCF Graduate Council, 2015). Nonetheless, it was not until 2008 that a major program redesign was proposed as a byproduct of the aforesaid CPED initiative (UCF Graduate Council, 2015). Since the UCF CEDHP became a CPED member in 2007, understanding the necessity of developing a practice-oriented Ed.D. program that shows integration between research and coursework in a professional doctorate was further solidified (Manathunga, Smith & Bath, 2004). As a result, several program redesign efforts have been made by the Ed.D. faculty, particularly to the research courses, so that they would indeed embody the use of Inquiry as Practice. Since UCF joined CPED, there have been two major and two minor Ed.D. program revisions in the last seven years. Even though the multiple redesign efforts that the Ed.D. program has experienced over the last ten years have involved core and specialization courses, as well as dissertation requirements, this study focuses solely on research course sequence changes for their effects on the complex problems of practice.

In 2008, the first documented Ed.D. revision presented by Dr. David Boote, the Ed.D. Program Coordinator at the time, encompassed changes to the program curriculum at multiple levels to address the needs of practicing educators from a variety of specializations. The research

course continuum involved two *Research Cluster Seminar* (IDS 7983) courses during the first and second years of the program, comprising a systematic literature synthesis in the area of specialization. In addition, the program also included a *Mixed Methods for Evaluation in Educational Settings* (EDF 6467) course during the second year, where students practiced various forms of collecting and analyzing quantitative and qualitative data for program evaluation. In the third year there were two more research components, *Issues and Research in Education* (IDS 7501), and *Case Studies in Educational Research* (EDF 6467), which continued to aid students in acquiring the necessary research skills to develop, design, and test educational practices (Boote, 2008; UCF Graduate Council, 2015).

The UCF Graduate Curriculum Committee meeting minutes from February 16, 2011, show that yet another program redesign effort took place (UCF Graduate Council, 2015). This revision's goal was to address the needs of professional educators by redefining research in terms of how it would be used by practitioners to identify and clearly articulate a problem of practice and carry out a comprehensive analysis to propose the best possible solution to said problem (J. Flanigan, personal communication, June 1, 2015). The changes, presented by newly appointed Ed.D. Program Coordinator Dr. Flanigan, reflect four research courses: *Analysis of Data for Complex Problems of Practice*, *Data, Assessment & Accountability*, *Evaluation of Complex Problems of Practice*, and *Identifying Complex Problems of Practice*. This program revision also included pre-requisite courses as well as internship and dissertation requirements (UCF, 2011; UCF Graduate Council, 2015).

Confirmation of a third and fourth minor program revisions can be found in the 2012-2013 and 2015-2016 UCF Graduate Catalogs. These two revisions do not portray any changes in the names and number of research course components but propose changes in core course

components, specialization requirements, and dissertation hours (UCF, 2012, 2015). It follows, then, that the same research course nomenclature has been used for the past four years, suggesting only minor changes to the courses' curricula and structure. A detailed study of the courses' syllabi and curricula will provide further evidence to corroborate this statement.

The existing information about the history and conceptualization of the research continuum evolution throughout the years demonstrates that there have been efforts made to redesign the research course sequence to reflect the true applied nature of the program. However, based on personal experience as a student, as well as from conversions with classmates and Ed.D. faculty members, there is the clear realization that the current Ed.D. research course continuum is not fully addressing the needs of advanced educational professionals in terms of providing them with the necessary applied research skills to resolve complex problems of practice in their professional fields.

Although very few research studies address the causes of this problem, it can be speculated that the existing gap between theory and research in the Ed.D. research course sequence can be seen as one caused by both individual and organizational problems (see Table 1), with the understanding that further research will be carried out for corroboration. At the individual level, the problem is caused by a cognitive factor, given that the faculty members who teach the research courses may not possess sufficient knowledge regarding the types of data collection and analysis that practitioners need.

Table 1: Summary of Individual and Organizational Causes and Theories Viewed Through Different Frames

Frames	Causes/Theories
Structural	Core program faculty and research faculty are often in different administrative units in the CEDHP and due to loose coupling the core faculty cannot ask the research faculty to change the research courses or comply with the program requirement of fixed days and times per cohort. (Divisionalized Organization, Bolman & Deal, 2013).
Political	Lie within the actual bureaucracy of the universities in terms of protecting territories by different departments within the colleges of education (Bengston et al., 2014).(Organizational Theory, Bolman & Deal, 2013; Ofoegbu et al., 2003).
Cognitive	Faculty members teaching the courses are not necessarily well versed in the type of particular data collection and analysis activities that advanced professional practitioners need (Bengston et al., 2014). (Sociocultural Theory, Baumgartner, 2001; Star & Stylianides, 2013).
Cultural	The research faculty does not often come from the culture of schools, and when practitioners are hired, they tend to revert to the culture of higher education. (Sociocultural Theory, Baumgartner, 2001).
Symbolic	The research courses are seen as symbols of rigor in doctoral programs. Changing the research course continuum may be perceived as a threat that weakens the perceived rigor of the Ed.D. program. (Organizational Theory, Bolman & Deal, 2013).
Motivation	Lack of self-efficacy in graduate students will impact their motivation in research courses, and their academic achievement, preventing them from mastering objectives and acquiring applied research skills. (Social Cultural Theory, Bandura, 1986; Usher & Pajares, 2008).

Baumgartner (2001) suggested using Vygotsky's (1978) guided learning theory, where teachers and learners are active participants in the learning process. This problem must also be addressed from a quality perspective. Quality knowledge describes how well something is understood, whereas knowledge type addresses only what is known. Procedural knowledge is a type of knowledge rather than a quality of knowledge (Star & Stylianides, 2013).

Likewise, at the cultural level Gallimore and Goldenberg (2001) explained how cultural settings and models affect the implementation of new initiatives. Culture influences what people think about, what skills they obtain, and the activities they participate in (Baumgartner, 2001). Confirmation can be found in the fact that the faculty members who teach the research courses usually do not come from a culture of schools, and in the event that practitioners are hired, they tend to revert to the culture of higher education.

Last, from a motivation perspective, it is common knowledge that self-efficacy beliefs help determine the choices that students will make, the effort they will put forth, the persistence and perseverance they will display when faced with challenges, and the amount of anxiety or relief they will feel as they experience such difficulties (Bandura, 1986). It follows, then, that students' self-efficacy beliefs can be used to predict academic achievement in research courses (Usher & Pajares, 2008). Hence, students who believe that their efforts are yield success will have an increased motivation and confidence while enrolled in the research courses, resulting in the mastering of course objectives and acquisition of the desired applied research skills (Usher & Pajares, 2008). In contrast, students with low self-efficacy will display decreased motivation and confidence towards the courses, preventing them from mastering all objectives and fully developing the anticipated research skills.

At the organizational level, causes of this problem can be considered through multiple lenses. At the symbolic level, Bolman and Deal (2013) explained that organizational culture is both a product and a process that embodies knowledge acquired and accumulated through experience and through the incorporation of new values and myths from new members. Under this premise, the research courses are regarded as a symbol of rigor within doctoral programs, and any changes in them might affect the rigor of the program.

In terms of the structural and political frames, the core program and research faculty are often in different administrative units in the CEDHP, making it difficult for the program to request any changes to the existing research courses offered in other doctoral programs. Equally, Bolman and Deal's (2013) description of organizations as arenas that have the important responsibility of shaping the rules of the game or acting as powerful tools for achieving a predetermined agenda helps explain the existing political conflict. Given that departments operate under different administrative units, tension arises across the CEDHP departments if the Ed.D. program elects to hire an "outsider" to teach the redesigned research continuum instead of including the permanent UCF research staff.

<center>National/International</center>

The debate regarding the necessity of offering two distinct doctoral education degrees at higher education institutions has persisted since the 1920s. Qualitative studies comparing both programs have shown that there are no substantial differences between the programs in terms of admissions, program, residency requirements, and coursework, and that the only major difference found was the use of a practical problem or survey as a substitute for the classic dissertation requirements of the Ph.D. programs (Andersen, 1983; Deering, 1998; Osguthorpe & Wong, 1993). These findings, together with the existence of similar advanced programs such as

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the Education Specialist (Ed.S.) program, continue to reiterate the growing concern about the quality of doctoral education and the specific role of the Ed.D. programs (Deering, 1998; Shulman et al., 2006). Hence, there is still a clear perception that the Ph.D. program is more complex and rigorous than the Ed.D. ("Ph.D.-lite") program, coupled with a lack of understanding that the degrees have two entirely different purposes (Shulman et al., 2006).

The characterizations of the Ph.D. program as "research-oriented" and the Ed.D. program as "non-research oriented" have remained fairly constant throughout the years; however, the role of the Ed.D. program continues to evolve. Many prospective doctoral degree seekers are making choices of which program to pursue based on their future employment and career options. The patterns of employment of Ed.D. graduates tend to gravitate towards the K-12 arena while Ph.D. graduates tend to get immersed in higher education (Andersen, 1983). Educational research and professional practice can benefit one another but have diverged into different activities; therefore, doctoral degrees in education that attempt to address both will always have shortcomings (Belzer & Ryan, 2013; Guthrie, 2009; O'Connell Rust, 2009).

Under this premise, Ed.D. programs have been exclusively designed for practitioners and cannot sufficiently prepare graduates to be fully successful while undertaking complex randomized trial designs due to the length of the program. Similarly, Ph.D. graduates are prepared to carry out research but not to succeed in the practitioner arena. Guthrie (2009) corroborated this notion by stating that a reputable doctoral program cannot include multidisciplinary cognate knowledge, understanding of education institutions, research immersion, mentoring, and a complete professional and content curriculum, especially on a part-time basis.

Developing scholarly practitioners has indeed been a lesson from long-term experiments for both national and international universities and colleges (Rueda et al., 2013). Ed.D. and Ph.D. mission statements of the top-ranked educational institutions explicitly describe the Ed.D. program as designed to prepare "practitioners to lead educational organizations" and the Ph.D. program to prepare those who desire to purse "an academic career focused on the generation of theoretical and research-based knowledge." In contrast, some institutions such as Harvard University, which offers only the Ed.D. degree, state that the program stresses the development of both "research and practitioners" that are interested in the "development of knowledge" and the "application of research to practice." Other institutions make no mention of the setting within which graduate will function and state that their mission is to "support and advance education by preparing outstanding leaders committed to the reform and continuous improvement of education" (Goldring & Schuemann, 2009). The aforementioned missions unmistakably highlight the many variations of diverging doctoral blueprints that exist across the nation. Still, one can draw the conclusion that regardless of the approach taken to design such blueprints, a distinguishing feature of advanced degrees is that the context is pivotal, and in this case the contexts of education research and practice have evolved to be increasingly dissimilar (Maxwell, 1996).

In order to understand the national history and conceptualization of the problem of practice, it is imperative to compare the different existing Doctor of Education and Professional Doctorate programs from CPED and other reputable universities in terms of their research course offerings and capstone projects (See Appendix C). Contrasting the different programs of study allows for a more in-depth understanding of the types of research courses being offered across the nation that aim to provide graduate students with the substantial research expertise required

to make decisions in their professional practices. This comparison also sheds light on the possible need to redesign some of these courses, as well as the suitability of the capstone projects being used. Information was obtained from the different educational institutions' websites.

The information summarized in Appendix C shows that most institutions rely on having three research courses in their professional doctorate programs. Some exceptions are Vanderbilt University, which offers four research courses (VU, 2015), and Johns Hopkins and Virginia Commonwealth University (VCU), which offer only two research courses (JHU, 2015; VCU, 2015).

Some institutions have introduced new research courses tailored after the CPED themes and principles of data-based decision-making, program evaluation, and action research (Bengston et al., 2014). For example, Arizona State University (ASU) and VCU's research courses emphasize program evaluation, while Virginia Tech's emphasizes action research (ASU, 2015; VCU, 2015; VT, 2015). While some CPED institutions like VCU are redesigning their research courses to align with the consortium's Working Principles, others continue to offer the same research courses before any program changes.

It would then follow that although the research courses offered in the various Ed.D. programs have similar names across CPED and other institutions, a closer look at the actual research course syllabi would possibly reveal that these courses do not share the common goal of providing applied research skills to professional practitioners but are instead very similar to the research courses offered for Ph.D. program. Substantiation for this statement can be found in some of the available syllabi for Ed.D. research courses at the CPED (2015b) website and in other sources. These reveal that despite efforts made to align their learning objectives with the needs of practicing educators, these continue to be more aligned with a research-based approach

than a practice-based approach. For instance, syllabus analysis for a *Quantitative Research Methods* Ed.D. in Educational Leadership course reveals that the learning objectives as well as assessments used are more aligned with a traditional research course rather than an applied research one (California State University-Sacramento, 2015).

As for the Ed.D. programs' summative evaluation, they all require a capstone project at the end of the program. These capstone projects are majorly described as applied dissertations that seek to study a complex problem of practice. Some universities integrate the development of the final project throughout the coursework, and the majority dedicate the last year for carrying out this project. It is interesting to note that Vanderbilt University (Ed.D.) and Georgetown (Doctor of Nursing Practice [DNP]) have partners that contribute to developing these capstone experiences. Actual high-performing professionals work with graduate students on current problems of practice at school districts or institutions, and hence, graduates have the first-hand experience of tackling such complex problems in professional practice and being a part of a team that works towards finding a solution. This approach not only ensures that students perform research that does indeed relate to professional practice while developing the necessary research skills but also provides the same valuable learning experience for all students that fosters an appreciation for the research skills learned and helps them feel more efficacious.

When comparing the existing Ed.D. programs to non-education professional doctorates such as the Doctor of Nursing Practice (DNP) or Doctor of Ministry (DMin), one can see the practice-based approach that these programs offer. For instance, the DMin program at Biola University does not offer research courses per se in its curriculum; it is entirely practical in nature, consisting of only three residencies wherein Ministers take one-week courses in their areas of specialization that provides them with practical applications (Biola University, 2015).

On the other hand, the DNP program at Georgetown University has three research courses that focus on showing students how to use original research and accelerate the adoption of best clinical practices based on these current research outcomes (School of Nursing and Health Studies, 2015). The inclusion of non-education professional doctorate research continuums provides insight of the role and function of research courses to preparation of advanced professionals in practitioner-based programs versus those of research doctorates, thus further informing the Ed.D. in Curriculum and Instruction research continuum redesign process.

International Ed.D. programs such as the ones offered in the UK and Australia have also undergone major revisions over the years; however, the origin and reason for these changes differ from the ones presented on this study. Henceforth, the problem of practice will not be examined from an international perspective due to the diverging evolutionary pathways of their Ed.D. programs with respect to the national ones.

Available syllabi from CPED institutions demonstrate that there is a continued effort to redesign the Ed.D. research course sequence to serve the needs of professional practitioners (CPED, 2015b). The underlying causes of the challenges presented when developing a suitable research course continuum are similar to the ones previously described for the local history and conceptualization of the problem. Possible individual causes include cognitive and cultural problems, while organizational causes include the structural, symbolic, and political frames, similar to the ones mentioned in the local context section. It could also be hypothesized that the human resource frame could also be included in the analysis. Existing research regarding these causes and the future course of action in terms of data collection to authenticate these causes will be discussed more thoroughly in the following section.

Causes and Factors

The problem of practice at hand could be explored from different lenses and methodologies, and hence the data collected were dependent on the selected research design and focus of the dissertation in practice (DiP). The aforementioned UCF organizational context, history, and conceptualization strongly suggest the need and call for a redesign of the Ed.D. research course continuum by carrying out a close analysis of the current research course syllabi and ensuring that they are not only aligned with the program goals but also provide a clear and detailed curricular map for the sequence of research courses. The development of a curriculum map detailing program, course, and individual unit objectives, instructional activities, and assessments will provide well-defined guidance to instructors so that students can acquire the necessary applied research skills to use in their professional practices.

In doing so, one could use the work of Tabak (2006), who proposed adopting the idea of pattern language to integrate concrete and abstract levels of description and noted the relationship between these elements, as well as the understanding by design approach based on big ideas and backwards design proposed by Wiggins and McTighe (2005) in conjunction with the revised taxonomy developed by Anderson and Krathwohl (2001). Further, in order to reinforce the use of inquiry in practice and the applied nature of the research courses as the staple of the professional doctorate, forming partnerships with school districts and other institutions would be most beneficial for the Ed.D. redesign process. These partnerships will enable the use of actual organizational data to apply theory to practice in authentic settings as instructional or experiential activities. As previously mentioned, this would not only signify giving students first-hand exposure and experience with real problems of practice, but would also ensure that students acquire the desired substantial applied research expertise to become scholarly practitioners and successfully use these skills in their professional arenas.

The problem of practice at hand could also be analyzed using evaluation techniques. For instance, performing a needs-assessment evaluation for the DiP should also provide further data regarding the need for the Ed.D. research course sequence redesign. Similarly, a small needs-assessment evaluation could be carried out first, and then use the findings obtained to redesign the curriculum map and Ed.D. research course continuum, resulting in a mixed evaluation-design DiP.

Additional local data would be collected depending on the lenses used to analyze the possible causes of this complex problem of practice. There are few research studies that have investigated individual or organizational factors that influence the research course sequence and curriculum of the professional doctorate programs. Bengston et al. (2014) stated that some of the existing challenges with the delivery of inquiry and research causes can be found on the structural and political frames of the organization. Universities as a whole can be said to function at a professional bureaucracy level consisting of highly skilled and educated professionals, yet the colleges also operate under a divisionalized structural configuration resembling a quasi-autonomous unit within individual divisions (Bolman & Deal, 2013). Consequently, some of the causes of the Ed.D. research course sequence problems lie within the actual bureaucracy of the universities in terms of protecting territories by different departments within the colleges of education and within the structure of the program requiring courses to be taught on a specific day and time for each cohort (Bengston et al., 2014).

Additional causes can also be found in the cognitive frame, given that faculty members teaching the courses are not necessarily well versed in the particular data collection and analysis activities that advanced professional practitioners need (Bengston et al., 2014). Likewise, having

a capstone project with the traditional five-chapter dissertation format and a one-size-fits-all program design also contributes to this problem (Bengston et al., 2014; Perry, 2015).

As previously summarized in Table 1, it can also be speculated that there are cultural causes, given that research faculty do not often come from the culture of schools, and when practitioners are hired to teach research courses they tend to revert to the culture of higher education. Finally, one must also consider that the research courses are seen as symbols of rigor in doctoral programs, as a result of a pattern of shared basic assumptions that have been learned collectively as the school adapts to external changes (Bolman & Deal, 2013). Therefore, changing the research course continuum may be perceived as a threat that weakens the perceived rigor of the Ed.D. program.

CHAPTER TWO: DESIGN SPECIFICATIONS

Purpose

The purpose of this design-based research study (Kelly, Lesh & Baek, 2008) is to redesign the Ed.D. in Curriculum and Instruction research course sequence at UCF, to ensure that that it fully provides advanced professional educators with the applied research skills necessary to become model scholarly practitioners. The redesign will be carried out through the use of Inquiry as Practice to provide a detailed curriculum map for all the current core research continuum courses in the program, using the CPED Design Concepts and Working Principles, as well as other curriculum design and development best practices.

This study aimed to achieve the following three goals:

1. Clarify the Ed.D. in Curriculum and Instruction program and research course objectives.

2. Develop a detailed curriculum map of the Ed.D. research courses to ensure alignment with program and course objectives of providing advanced professional practitioners with necessary applied research skills to identify, analyze, evaluate, and solve complex problems of practice.

3. Redesign individual research course curricula sample units to provide students with clear learning experiences that lead to their acquiring the desired applied research knowledge and skills.

Attainment of these goals will ensure that students acquire substantial research expertise that can be applied to their professional practices. Developing a detailed curriculum map using the principle of backward design to identify the learning outcomes of the Ed.D. in Curriculum and Instruction program will facilitate the identification of where learning objectives are addressed within the curriculum. In this manner, it can be established that the course curricula are systematically aligned with the program, and potential gaps and/or redundancies in both the continuum and individual courses can be identified. The result is a research course sequence that addresses the complex problem of practice. Table 2 shows a summary of the proposed solutions and design choices for each established goal based on research-based best practices. These will be discussed in the next section.

Table 2: Proposed Design Choices and Solutions to Attain the Study's Goals

Goal	Design Choices/Solutions	Sources
1. Clarify the Ed.D. in Curriculum and Instruction program and research course objectives.	Gather course and syllabi data, informational interviews with program faculty members, and development of logic model.	CPED (2015b); UCF (2015), Jacobs (2004); Langley et al. (2009); Fitzpatrick, Sanders & Worthen (2011).
2. Develop a detailed curriculum map of the Ed.D. research courses.	Backwards design program objective alignment with broad outcomes for students and then for specific courses, through the use of matrices.	UCONN (2015), Jacobs (2004); Uchiyama & Radin (2009).
3. Redesign individual research course curricula.	Teaching, Learning and Reasoning Theories.	Brown, Collins & Duguid (1989); Shaughnessy (2003).
	CPED Working Principles, Understanding by Design (UbD), Revision of Bloom's taxonomy Universal Design for Learning (UdL), Personas, Consistency, Constraint, Objectives Hierarchy, TPACK, Assure Model.	CPED (2015d), Wiggins & McTighe (2005), Anderson & Krathwohl (2001), CAST (2012), Lidwell, Holden & Butler (2010), Pratt (1994), Mishra & Koehler (2006), Smaldino et al. (2012).

Design Principles

Design Concept Definitions

The following is a set of design concepts and definitions that provide clear guidance in order to decrease the curriculum implementation threshold. They are also specialized descriptions that support the development of the Scholar Practitioner who embodies the skills and abilities that a graduate from a CPED Ed.D. program should have (CPED, 2015c).

Curriculum Mapping

Curriculum mapping is a procedure for collecting data about the operating curriculum in a learning institution and, thus, the instruction that students are receiving. As such, it is a focal

point for addressing curriculum, instruction, and assessment and an active tool for aligning

instructional goals and objectives, pedagogies, and assessments. Further, curriculum maps

provide living documents that can be revised in terms of student needs for timeliness (Jacobs,

2004).

Universal Design for Learning

The universal design for learning (UdL) is a framework to advance and enhance teaching

and learning for all people based on scientific insights, which guide the design of instructional

goals and strategies, assessments, methods, and materials that can be adapted and adjusted to

meet individual needs (CAST, 2012).

Personas

The use of personas is a technique that relies on the creation of fictitious users to guide

the decision-making process of curriculum design. It involves creating profiles for a small

number of representative users, where each profile represents a combination of a subpopulation

of users, such as student and instructor groups (Lidwell, Holden & Butler, 2010).

Consistency

Consistency refers to the increased usability and learnability of systems when similar

parts are expressed in similar ways, as it enables people to transfer knowledge to new contexts

with more efficiency. Curriculum design has to show aesthetic, functional, and both internal and

external consistency to be easily recognizable by stakeholders in the program and be simple to

use, revise, maintain, and learn, in order to support teaching and learning (Lidwell et al., 2010).

Constraint

Constraint is a technique to limit the actions that can be performed to a system. In curriculum design, the use of constraints simplifies usability and minimizes errors by clearly defining the intended goals, objectives, pedagogies, and assessments for the research course continuum (Lidwell et al., 2010).

Scholarly Practitioner

Scholarly Practitioners blend practical wisdom with professional skills and knowledge to name, frame, and solve problems of practice. They use practical research and applied theories as tools for change because they understand the importance of equity and social justice. They disseminate their work in multiple ways, and they have an obligation to resolve problems of practice by collaborating with key stakeholders, including the university, the educational institution, the community, and individuals (CPED, 2015c, para. 2).

Signature Pedagogy

CPED (2015c) defined Signature Pedagogy as the pervasive set of practices used to prepare scholarly practitioners for all aspects of their professional work: "to think, to perform, and to act with integrity" (Shulman, 2005, p .52). Shulman asserted that signature pedagogy includes three dimensions (as cited in CPED, 2015c):

1. Teaching is deliberate, pervasive, and persistent. It challenges assumptions, engages in action, and requires ongoing assessment and accountability (CPED, 2015c, para. 3).

2. Teaching and learning are grounded in theory, research, and in problems of practice. It leads to habits of mind, hand, and heart that can and will be applied to authentic professional settings (CPED, 2015c, para. 3).

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3. Teaching helps students develop a critical and professional stance with a moral and ethical imperative for equity and social justice (CPED, 2015c, para. 3).

Inquiry as Practice

Inquiry as Practice is the process of posing significant questions that focus on complex problems of practice. By using various research, theories, and professional wisdom, scholarly practitioners design innovative solutions to address the problems of practice. At the center of Inquiry as Practice is the ability to use data to understand the effects of innovation. As such, Inquiry as Practice requires the ability to gather, organize, judge, aggregate, and analyze situations, literature, and data with a critical lens (CPED, 2015c, para. 4).

Laboratories of Practice

Laboratories of Practice are settings where theory and practice inform and enrich each other. They address complex problems of practice where ideas—formed by the intersection of theory, inquiry, and practice—can be implemented, measured, and analyzed for their impact. Laboratories of Practice facilitate transformative and generative learning that is measured by the development of scholarly expertise and implementation of practice (CPED, 2015c, para. 5).

Problem of Practice

A Problem of Practice is as a persistent, contextualized, and specific issue embedded in the work of a professional practitioner, the addressing of which has the potential to result in improved understanding, experience, and outcomes (CPED, 2015c, para. 6).

Dissertation in Practice

The Dissertation in Practice is a scholarly endeavor that impacts a complex problem of practice (CPED, 2015c, para. 7).

Ed.D. Curriculum Redesign Principles

CPED Working Principles

UCF has been a member of the CPED Consortium since the initiative's inception; therefore, the research curriculum redesign will utilize the CPED Design Concepts and guidelines. As part of the professional doctorate redesign efforts, CPED (2015d) has defined the professional doctorate in education as one that "prepares educators for the application of appropriate and specific practices, the generation of new knowledge, and for the stewardship of the profession" (para. 1). To ensure consistency amongst Consortium members, CPED (2015d) has identified six Working Principles to guide the development of quality professional practice preparation and to provide a frame to build Ed.D. programs. The statements in italics represent the Working Principles that will be applied to the research course sequence redesign.

The Professional Doctorate in education:

1. *Is framed around questions of* equity, *ethics*, and social justice *to bring about solutions to complex problems of practice*.

2. *Prepares leaders who can construct and apply knowledge* to make a positive difference in the lives of individuals, families, organizations, and communities.

3. *Provides opportunities for candidates to develop and demonstrate collaboration and communication skills to work with diverse communities* and to build partnerships.

4. *Provides field-based opportunities to analyze problems of practice and use multiple frames to develop meaningful solutions*.

5. *Is grounded in and develops a professional knowledge base that integrates both practical and research knowledge, that links theory with systemic and systematic inquiry*.

6. *Emphasizes the generation, transformation, and use of professional knowledge and practice*.

The Ed.D. research continuum curriculum redesign will be carried out taking into account all these Working Principles, especially principles 4 and 5, which clearly highlight the need to have high-quality mixed-methods research courses that are developed with the intentionality of understanding the research skills that practicing leaders and educators need in their organizations (Bengston et al., 2014; CPED, 2015d; Perry, 2015).

<u>Improvement Science</u>

The application of improvement science principles has considerably improved quality, productivity, and general practices in industries such as health care and manufacturing (Langley et al., 2009; Lewis, 2015). Given the evident success of this model for improvement, educational institutions are increasingly adopting and engaging in disciplined inquiry to foster a culture of continuous improvement and build capacity throughout the organization (Carnegie Foundation, 2015). The Carnegie Foundation (2015) advocated anchoring practice improvement (Core Principle of Improvement 5) in disciplined inquiry through the use of iterative cycles of change to guide a focused learning journey, using data to determine whether an implemented change yielded the desired improvement and inform practice (Gazza, 2015; Langley et al., 2009).

Since the model for improvement framework is unequivocally designed to accelerate the acquisition of a "system of profound knowledge" (Deming, as cited in Langley et al., 2009, p. 75) needed to make changes that will result in improvement (Langley et al., 2009) as well as learning-by-doing, it provides the methodology required to use disciplined inquiry to solve specific problems of educational practice (CFAT, 2015). Consequently, improvement science principles will be used to redesign the Ed.D. in Curriculum and Instruction research course sequence, especially for the evaluative inquiry courses. Further, improvement science clearly

embodies the use of Inquiry as Practice, an essential trait of the UCF professional doctorate graduate or scholarly practitioner.

Similarly, this design study will be performed by maintaining an applied research and practical theory approach, which provide a fresh view of the professional doctorate in education, resulting in the rigor, prestige, and purpose that the Ed.D. program deserves (Shulman et al., 2006). The integration between research and coursework is key to the formation of scholarly practitioners who can make a substantial contribution to the knowledge of professional practice through applied research (Manathunga et al., 2004).

Curriculum Mapping

Curriculum mapping is a procedure for collecting data about the functional curriculum in a school setting or reconstruction of the curriculum referenced to a calendar, which promotes the creation of a visual representation of a curriculum based on real time information (English, 1980; Jacobs, 2004). Therefore, curriculum mapping makes it feasible to identify where learning objectives are being addressed within the curriculum, providing a means to establish whether objectives are aligned with the curriculum. Alignment refers to having a clear understanding of what students do in their courses and what faculty expects them to learn (UCONN, 2015). As previously indicated, this study will first clarify the program and research course goals, which are the broad outcomes intended for all students. This clarification will be followed by the use of backward design principles for academic program outcomes and then by the design of research course outcomes that will result in the achievement of program and college outcomes (UCONN, 2015).

The Ed.D. research course sequence will follow a sequential/integrated model as defined by Manathunga et al. (2004), where the coursework and dissertation components are completed

consecutively, with some courses feeding into the Dissertation in Practice. Curriculum mapping in higher education is generally done within a specific major and constructed based on syllabus reviews and faculty-self report and discussion (Lancaster, 2015). Therefore, the initial phase of this Ed.D. research continuum curriculum mapping uses a template with set categories and format (see Appendix D) to collect data. Data are collected through reviewing of the syllabi and holding informational meetings with Ed.D. faculty members, so that the curriculum can be analyzed in terms of alignment with program objectives. This analysis allows for the identification of gaps that can be translated into curricular changes that improve student learning (Jacobs, 2004; UCONN, 2015; Uchiyama & Radin, 2009). These preliminary findings will then be used as suggested by UCONN (2015) to create a curriculum alignment matrix (see Table 3) to determine the alignment of courses with the formerly clarified Ed.D. program objectives.

Table 3: Curriculum Alignment Matrix

Course	Program Objective 1	Program Objective 2	Etc.
EDF 7457			
EDF 7494			
EDF 7478			
EDF 7468			
I = introduced**, P =** practiced**, D =** demonstrated			

Adapted from Allen (2004)

Additionally a course alignment matrix per course (see Table 4) shows where the research course objectives support the overall Ed.D. program objectives. The connections between the UCF Ed.D. program objectives and research course objectives is further established

by using matrices that provide an overall map of the program to individual research courses (see

Table 5), as well as a program outcomes as they relate to the program educational objectives.

Table 4: Course Alignment Matrix

Course Alignment Matrix			
Course Objectives	**Program Objective 1**	**Program Objective 2**	**Etc.**
Course Objective 1			
Course Objective 2			
Course Objective 3			
Etc.			
B = basic, **I =** intermediate**, A** = advanced expectation			

Adapted from Allen (2004)

Table 5: Research Course Sequence Curriculum Map

Curriculum Map	
Program Objectives **Program Research Courses** **Individual Course Objectives** **(example)**	• EDF 7494 • EDF 7478 EDF 7478: Analysis of Data for Complex Problems of Practice By the end of the semester students will be able to (quantitative unit): 1. Differentiate between the different types of variables and scales of measurement. 2. Construct suitable graphical summaries of data using Excel (categorical, numerical, and percentiles). 3. Use Excel effectively to analyze and interpret graphical displays data. 4. Etc.

Individual Course Design

The professional doctorate in education (Ed.D.) is a program designed to prepare advanced educators who are interested in teaching in a college, university, or community college or who are interested in leading curriculum and instructional improvement initiatives in a school, school district, institution of higher education, military, or business setting (UCF-CEDHP, 2016). Hence, its focus is on providing students with the practical skills needed to solve complex problems of practice in their professional arenas. As such, the research course sequence in this program must provide students with the necessary applied research skills that can be used in their respective organizations (CPED, 2015d).

Under these premises, the Ed.D. research curriculum must be developed to address these needs. Individual course design will be carried out by using the Understanding by Design (UbD) framework provided Wiggins and McTighe (2005), which also uses the backwards design principle to guide curriculum, instruction, and assessment in a three-stage process. Further, Anderson and Krathwohl's (2001) revised taxonomy will also be used to write both course and individual unit objectives belonging to the different types of knowledge and cognitive process levels. This methodology allows for a clear scaffolding of each unit, providing guidance to instructors and learners and the opportunity for authentic assessment and differentiation to address multiple student needs.

Pratt's (1994) learning objective classification, and the integration of differentiating principles defined by the Universal Design for Learning (UdL) that give all individual equal opportunities to learn (CAST, 2012) are also to be used as research-based best practices for curriculum design during this study. Tables 6 and 7 depict sample accommodations used while designing the individual research courses. The example shows individual and cultural differences using research-based design principles for differentiated instruction as well as strategies to

support implementation for the prototype quantitative unit for EDF 7478 presented in Appendix E. The same design principles and strategies are used while designing units for each of the courses in the research continuum so that they are suitable to individual units and end-user needs.

Table 6: Six Sample Accommodations for Individual and Cultural Differences for EDF 7478 Quantitative Unit

	Difference	Strategy of accommodation
1	Excel Ability	Simple Video tutorials (prerequisite)
		In-class pairing, instructor modeling, individual help (low anxiety, typical ability student)
		Advanced functions from reading/videos/exempt from workshop lessons (high ability students that passed diagnostic)
		Textbook is Excel-infused.
2	Statistical Ability	Reading Modules
		Discussion
		Extensions
3	Anxiety/Fear	Scaffolding
		Small challenges
		Peer partnering
4	Student Professional Roles	Choice of articles and data sets to include examples to address these differences over the course of the semester.
5	Language	Clear definitions
		Use of graphics
		Videos for dual coding

Adapted from Clark and Guillemette (2015)

Table 7: Six Sample Strategies to Support Implementation of EDF 7578 Quantitative Unit

	Design strategy	Rationale	Sources
1	Unit Scaffolding in Weeks, Assignments, Rubrics and Resources for Excel Proficiency	Some of the instructors may feel apprehensive to use Excel as a teaching tool. Some of the research read on the use of Excel in professional doctorates mentions that instructors actually spent six months previous to the class' staring date getting acquainted and comfortable running all the different statistical procedures that they would use in the course. Some of them may be accustomed to using SPSS or SAS, which operate differently than Excel.	Azuero, Wilbanks & Pryor (2013); CAST (2012); Davis & Krajcik (2005).
2	Applied Focus Design for this Quantitative Unit	Some faculty may believe that all doctoral students should carry out a quantitative dissertation, as it otherwise could be perceived as a non-rigorous program. This is not the case given that our program has many students that will carry out qualitative dissertations. Further, the goal of this unit is to provide students with skills that can be used at their respective jobs, so the sole use of theoretical statistical approaches are not suitable.	CPED (2015d); Bengston et al., (2014); Perry (2015).

	Design strategy	Rationale	Sources
3	Detailed assignment and rubrics with data set examples and weekly layouts	Instructors that may come from a culture of schools, with some statistical concept misconceptions. Research suggests that curriculum materials should be developed to help strengthen the instructor's statistical reasoning and knowledge, and providing examples that they could carry out by themselves before doing it with students to provide opportunities for addressing such possible misconceptions. They can also come from a pure research culture and having explicit examples will help keep the focus on the applied nature of doctoral professional practice courses.	Anderson & Krathwohl, 2006; CAST (2012); Pratt (1994); Wiggins & McTighe (2005).
4	Use of Personas	The use of personas helps the instructor understand the main student group audiences, the goal for this course and so that they will have to adjust any instructional strategies, comprehend the goal of the curriculum and plan their lessons accordingly.	Lidwell et al., (2010)
5	Learner-centered strategies provided	Models and frameworks in statistical learning research suggest the use of constructivist learner-center teaching strategies, as students build conceptions in a gradual manner, so some of the instructors may have misconceptions that lead more towards a teacher-centered approach, thus leaving aside individual learner's need.	Brown et al. (1989); Shaughnessy (2003).

	Design strategy	Rationale	Sources
6	Use of Excel in lieu of other statistical software	Excel is more user-friendly and available to advanced practitioners in their organizations. Proficiency in Excel will enable students to carry out any statistical analysis readily in their day-to-day jobs, and is not only available to all UCF students, but also transferable beyond the research courses.	Azuero et al. (2013); DiMaria-Ghalili & Ostrow (2009)

Since the newly designed curriculum map and research courses are part of professional practice doctoral mixed-methods courses, the units take into consideration the following personas, which represent both the main student audience groups and main instructor user types. Lidwell et al. (2010) proposed the use of personas when designing curriculum, as it allows stakeholders to envision the needs of different types of product end users. Hence, this curriculum proposes objectives, assessments, and strategies that seek to enhance quantitative research skills for advanced professional educators and to support instructors as they implement this curriculum in a manner consistent with the intended established goals as shown on the prototype UbD curriculum overview for the quantitative unit for EDF 7478 (see Appendix E).

Student Personas

Hanna is an elementary school teacher that has never liked math and becomes very anxious when she needs to do calculations. Because of this anxiety she avoided mathematics classes as much as possible through her undergraduate and master's programs. Thus, she also lacks much of the prior knowledge that would support her learning in this course.

Ash is a high school Government teacher, and while he doesn't seek out mathematical classes, he has taken several in support of his studies. Hence, he has some prior knowledge of basic statistics and is motivated to learn the new content.

Finally, *Vera* works for UCF and uses Excel all the time. As part of her master's study, she learned how to do several types of statistical tests and enjoyed it. She took three extra quantitative classes before beginning the Ed.D.

Faculty Personas

All instructors of record for this unit must possess a doctoral degree from an accredited institution. This scenario considers the possibility of having a GTA (Practicing Dr.) that may teach this unit if his/her background for this unit resembles "Dr. Ideal's" background and either Dr. Ideal is not available or Dr. Practice or Dr. Research delegates this unit to him/her.

Dr. Ideal has an extensive expertise and experience in both quantitative and qualitative research methods. This individual has been a K-12 practitioner and has also held leadership positions where she used and analyzed data in the professional arena successfully for school accountability purposes. Later in her career, she became a college professor and has taught a multitude of courses to include both qualitative and quantitative research courses. Thus, she has an in-depth understanding and knowledge of applied statistics and the modification of traditional research courses as it pertains to the uses and importance for advanced professional practitioners to acquire these research skills.

Dr. Practice (& *Practicing Dr.*) also has a doctoral degree; however, he has spent most of his career in the K-12 arena. He started as a teacher and then moved to leadership positions within the district, private school, or education corporation involving school assessment and accountability. When he started teaching the applied statistics course for the Ed.D. course, he

was also asked to teach the Ed.D. in leadership course, which follows the traditional research course syllabus. As a result, it could be easy for him to revert to a higher education culture and leave behind the K-12 experience that he was supposed to embed in his Ed.D. applied statistics course.

Practicing Dr. is still working on his Ed.D. degree but has substantial expertise working with K-12 data, and he holds a leadership position within the district, such as the assessment and accountability department or other similar positions. Hence, he is very knowledgeable in applied research skills for professional practitioners and could lead one or more class sessions, as well as support students by serving as a GTA for the course.

Finally, *Dr. Research*'s teaching background derives mainly from college-level courses. She has been a statistics college professor for over ten years and has been teaching research courses for Ph.D. programs at the University. Although Dr. Research is very knowledgeable in statistics and does a very good job of teaching traditional research courses, she has very little to no K-12 cultural background and practitioner experience and believes that research course curricula should be the same for both Ph.D. and Ed.D. programs.

Teaching, Learning, and Reasoning Theories

Since this design study focuses on establishing goals and developing a detailed curriculum map for the research continuum and for individual research courses, it is imperative to understand the underlying teaching, learning, and reasoning theories that will provide the framework for the research course sequence redesign. Instruction in research methods, and more specifically in statistics, is an essential requirement for most university advanced degrees, and the Ed.D. in Curriculum and Instruction program at UCF is no exception (Leech & Haug, 2015). Given the applied nature of the professional practice program, research courses must be designed

taking into consideration data-oriented approaches using real-world data to develop students'

interest and support the growth of statistical reasoning skills, while differentiating them from

theoretical research courses traditionally found in the Ph.D. programs (CPED, 2015d; Leech &

Haug, 2015; Shaughnessy, 2003). Subsequently, this design study will consider theoretical

frameworks that provide best-practices solutions for the problem of practice that identify

reusable design principles for teaching and learning doctoral-level research courses.

<u>Constructivist Learning Models</u>

Smaldino, Lowther, and Russell (2012) defined constructivism as a movement that goes

beyond the ideas of cognitivism, as it considers the engagement of students in meaningful

experiences conducive to meaningful learning. It is also a philosophical view on how we

understand or know (Savery & Duffy, 1996). When considering the instructional design of the

research continuum courses, one must, therefore, establish a learning environment that fosters

the defined learning outcomes through the use of research-based instructional practices. The

following constructivist principles of effective instruction suggested by Smaldino et al. (2012)

were taken into consideration during the research course sequence curriculum redesign:

- Assessing prior knowledge

- Considering individual differences

- Stating objectives

- Developing metacognitive skills

- Providing social interaction

- Incorporating realistic contexts

- Engaging students in relevant practice

- Offering frequent, timely, and constructive feedback.

The aforementioned prototype unit design, strategies, and accommodations for EDF 7478 clearly show how these principles, which are also congruent with those described by the CPED Working Principles (CPED, 2015d), are already being implemented in the design process and will continue to be used throughout the research study. Since effective instruction requires careful planning, the research courses will have a marked technology component and the ASSURE model principles will be incorporated into the different unit redesigns. This model, widely used for adult learners (Smaldino et al., 2012), uses a step-by-step process to create lessons that effectively integrate technology and media into the curriculum with the aim of improving student learning.

Savery and Duffy (1996) also stated that there is a clear link between the theoretical principles of constructivism and the practices of instructional design and teaching. Under this premise, tasks and learning environments should be designed to reflect the actual complexity of the environment in which students will function after the learning has taken place (Savery & Duffy, 1996). This applied learning model is consistent with the cognitive apprenticeship model proposed by Brown et al. (1989) and will be followed during this design-based research study. In the apprenticeship model, activity and situations are integral to cognition and learning, and knowledge is a product of the activity and situations in which it is produced (Brown et al., 1989). Hence, this model provides a framework to design the research continuum courses in agreement with their applied nature, where students will learn by doing as they work on realistic tasks to solve complex educational problems of practice.

Statistics Education

Statistics education research focuses on two main areas: students' knowledge and reasoning about statistics and teachers' knowledge of teaching and practices in statistics

(Shaughnessy, 2003). According to Shaughnessy (2003), models of statistical thinking refer to what we want learners, consumers, and producers of statistics to do; models of statistical literacy help identify critical statistical survival skills for school students and adults; and models of statistical reasoning are used to identify and track students' and adult' statistical reasoning and conceptual development, by scaffolding statistical ideas for teaching. In essence, research courses should be designed so that students can act as learners, consumers, and producers at their jobs of practice-based research through the use of normative, perspective, and descriptive statistical frameworks (Shaughnessy, 2003).

Various statistical models afford frameworks to understand the different types of statistical thinking; interpret, critically evaluate, and express opinions about statistical information; and provide models of student reasoning as they understand the various statistical concepts (Gal, 2004; Shaughnessy, 2003). Likewise, research on teachers' understanding of statistics sheds light on the need for effective professional development that provides opportunities for statistical reasoning for teachers, resulting in the development of real statistical activities for their classrooms (Shaughnessy, 2003). These frameworks must be considered when redesigning any research course, as they represent a heuristics for developing quantitative units within the research continuum that will translate into the selection of correct instruction, implementation, instructor support, and evaluation strategies for this study's research curriculum.

Professional doctorate statistics courses have usually been designed to use statistical software programs such as SPSS or SAS. These software programs are very effective for traditional research courses; however, they are not suitable for Ed.D. research courses, as they belong to practice-oriented programs that seek to provide advanced professional educators with the necessary applied research skills to solve complex problems of practice at their organizations.

Accordingly, the use of software such as Microsoft Excel for quantitative units is proposed in this study when redesigning the research course curricula, given that it is user friendly, it is available to all UCF students, its usability extends beyond the classroom, and it is the main software available for educators at their institutions. Further, Microsoft Excel seems to fit the need for a program based on non-traditional research dissertations (dissertations in practice) and provides an excellent foundation for a research career if such is elected in the future (DiMaria-Ghalili & Ostrow, 2009).

The benefits of using Microsoft Excel to design research course curricula is also observable in other professional doctorates and doctoral-like the nursing programs, given that Excel supplies a more efficient way to demonstrate the data-analysis skills component of the research process. It also lends itself to the development of mixed-mode or distance-based courses (Azuero et al., 2013; DiMaria-Ghalili & Ostrow, 2009; Lauver & Phalen, 2012).

Pedagogical and assessment models for graduate statistics courses utilizing Excel will also be incorporated into the curriculum design. These include the use of a pre-assessment, the presence of clear weekly plans, the availability of a standard textbook as reference, the possibility of face-to-face workshop sessions where students become familiar with the different statistical tests, the carrying out of assignments using real educational data at home, the providing of extensive feedback using dual coding, and the execution of a summative mixed-methods project (Azuero et al., 2013; DiMaria-Ghalili & Ostrow, 2009; Lauver & Phalen, 2012; Smaldino et al., 2012). The presented prototype UbD curriculum for the EDF 7478 quantitative unit depicts the use of these models (see Appendix E).

<u>Educative Curriculum</u>

Davis and Krajcik (2005) defined educative curriculum materials as K-12 curriculum materials that are developed with the intent to promote teacher learning as well as student learning. Even though this design study will be focused on developing research course curricula for doctoral courses, the heuristics of educative curriculum materials it proposes can be adapted and partially implemented as part of the independent unit design in accordance with the previously depicted personas. For instance, the introduction of Microsoft Excel into the course will require instructor mastery and familiarity with specific statistical functions (DiMaria-Ghalili & Ostrow, 2009).

Providing educative curriculum materials to help instructors become more effective by enhancing their pedagogical content knowledge (PCK) for statistics using Excel would be extremely beneficial for instructors with different backgrounds from that of *Dr*. *Ideal*. The educative curriculum materials will be provided online, so that a larger amount of information is available, making it possible for each instructor to use the resources at their own time and pace, utilizing different types of media (Davis & Krajcik, 2005; Smaldino et al., 2012). The use of educative curriculum materials also allows for curricular control in the design, as specific instruction and assessment activities would be provided to ensure that the research courses maintain their applied nature and align to the program objectives.

<div align="center"><u>Significance of the Study</u></div>

Since UCF joined the CEPD initiative in 2007, Ed.D. redesign efforts have concentrated on developing a more practice-oriented program that focuses on inquiry and research. Despite the several reform efforts made, the current research course sequence is still not fully attaining the short-term outcomes as defined in the logic model in Appendix A. The need for this design-

based research study has been established by the core UCF Ed.D. in Curriculum and Instruction faculty and has also been noted by students through informal conversations about their program experiences and information received from student course evaluation data. Additionally, given that the Ed.D. in Curriculum and Instruction program has been offered in the same manner for several years, it is appropriate to study this program of practice to verify whether the intended outcomes are being met through the development of a detailed curriculum map of the research continuum.

Preliminary analysis of the organizational context, history, and conceptualization of the problem strongly suggests the need to redesign the Ed.D. research course continuum and provide a detailed curriculum map for the sequence of research courses. The use of Inquiry as Practice as a framework to redesign the Ed.D. in Curriculum and Instruction research continuum at UCF, together with the above-mentioned design principles, provides a solution to ensure that the research course sequence in the program will provide advanced professional practitioners with the applied research skills necessary to become model scholarly practitioners who can effectively solve complex problems of practice at their organizations, in accordance with the Working Principles described by CPED (2015d) .

This design study could also shed light on the previously speculated individual and organizational causes of this problem of practice, contributing to the scarce existing research on the topic, by looking at the causes through the structural, political, cognitive, cultural and symbolic frames.

<center>Documentation and Evaluation Plan</center>

In the case of this design-based research study, it could be argued that the development of a detailed curriculum map and the Ed.D. research course redesign do not require the collection of

extraneous data. The present study made use of personal communications with different Ed.D. core program faculty and the Program Coordinator. Additionally, current syllabi, assessment instruments, and other internal materials were used to analyze this problem. All personal communications and meetings to address this study were documented in electronic format. Likewise, data obtained from each separate course were filed together in electronic format, along with the preliminary curriculum map information sheet in Appendix D. Each design decision for any curriculum map item was research-based and also documented electronically, allowing for revisions and sharing of information during collaboration sessions. In the same manner, all design decisions pertaining to independent research course curricula were based on research-supported best practices and documented electronically.

The apparent lack of research to substantiate the causes behind this problem of practice points to a gap in the research that could be addressed. Thus, instruments could be devised to collect data that would validate the speculated organizational and cognitive causes of the problem of practice. Interviews and surveys would be appropriate to collect data that could further corroborate the structural, political, symbolic, cognitive, and cultural causes.

The pilot implementation of the research course sequence prototype would take place in the Fall 2016 semester after being accepted by the Ed.D. core faculty members and would be evaluated after a year via student course evaluations and data obtained from graduates relating to the usability of the research course in their organizations. The curriculum map should be revised annually making sure that program and individual course objectives are aligned and that the design still follows the CPED Working Principles and successfully addresses this study's complex problem of practice.

<center>Deliverables</center>

The final product consists of fully developed curriculum maps using backwards design

(Wiggins & McTighe, 2005) for individual research courses, with defined instructional

objectives and learning outcomes that seek to address the problem of practice and that have been

mapped and aligned with the course and program expected outcomes. The prototype curriculum

alignment matrices, information sheets, UbD curriculum map templates, accommodations, and

implementation strategies depict the items that represent the finalized product of this design

study. These are available in Chapters 3 and 4 of this dissertation in practice. A detailed

performance task sample and a unit curriculum map corresponding for EDF 7478 can be found

in Appendices E and H. Further, sample technology-rich lesson plans and assessments are also

presented in Chapter 4 and Appendix I.

The redesign also looks into recommending the incorporation of partnerships with

educational institutions or other university departments to provide Ed.D. students with authentic

instructional activities to learn through real context applications, and value the research

continuum content. Hence, one could include a variation of the educative curriculum model

designed by Davis and Krajcik (2005) to have continual learning opportunities for these external

instructors or for any end-user, as defined by the suggested personas.

<center>Key Milestones</center>

Successful completion of this design-based study required a structured plan detailing the

key milestones and deadlines that must be satisfied as shown in Table 8.

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Table 8: Timeline for Design-Based Research

Goal	Due date	Collaboration/Support
1. Clarify the Ed.D. in Curriculum and Instruction program and research course objectives.	August - November 2015	UCF Ed.D. Faculty (initial course data/identification of gaps)
2. Collect student course survey and preliminary curriculum map data.	November 2015	UCF Ed.D. Faculty (informational meetings, syllabi, course resources)
3. Develop a detailed curriculum map of the Ed.D. research courses.	December - February 2015	Dr. Boote and Dr. Vitale
4. Redesign individual research course unit samples.	February - April 2016	UCF Ed.D. Faculty (feedback, informational meeting)
5. DiP Draft	May 2016	Dr. Boote
6. Defense	June 2016	Dissertation Committee Members
7. Revisions/Final Copy	July 2016	Committee Members
8. Implementation	August 2016	UCF Ed.D. Faculty
9. Evaluation	August 2017- ongoing	UCF Ed.D. Faculty, students and graduates

CHAPTER THREE: CURRICULUM MAPPING PROCESS

<u>Introduction</u>

This chapter and the next describe in detail the curriculum mapping and design process carried out during the clarification of the Ed.D. in Curriculum and Instruction program goal and objectives, individual research course instructional objectives and outcomes, the development of individual course UbD curriculum maps and lesson samples, as well as the methods used to create curriculum maps for the research continuum. All proposed design choices and solutions shown in Table 2 will be further discussed, with each of the finished products addressing each of the goals of this design-based research study:

1. Clarify the Ed.D. in Curriculum and Instruction program and research course objectives.

2. Develop a detailed curriculum map of the Ed.D. research courses to ensure alignment with program and course objectives to provide advanced professional practitioners with necessary applied research skills.

3. Redesign individual research course curricula sample units to provide students with clear learning experiences that lead them to the acquisition of the desired applied research knowledge and skills (addressed in Chapter 4).

Further, these chapters document the data collection and analysis process; discussions with core faculty members; and the frameworks, models, and principles that informed the

decisions that led to the selected curriculum and mapping choices, culminating in the proposed prototypes that follow.

At present, the Ed.D. in Curriculum and Instruction research course sequence at UCF consists of three courses: EDF 7949, Identifying Complex Problems of Practice; EDF 7478, Analysis of Data for Complex Problems of Practice; and EDF 7468, Evaluation of Complex Problems of Practice. During the DiP Proposal Defense, the inclusion of EDF 7457, Data, Assessment, and Accountability, into the research sequence was discussed with the Dissertation Committee, comprising program faculty members, including the Program Coordinator. The decision to include EDF 7457 into the research continuum was unanimous. Accordingly, the curriculum design and mapping process was carried out to include the four aforementioned research courses, as shown in Figure 2, which depicts the incorporation of EDF 7475 (shown in dark purple) into the Ed.D. research courses and their schedule.

EDF 7457: Data, Assessment, and Accountabiliy (Fall I) → EDF 7949: Identifying Complex Problems of Practice (Spring I) → EDF 7478: Analysis of Data for Complex Problems of Practice (Fall II) → EDF 7468: Evaluation of Complex Problems of Practice (Spring II)
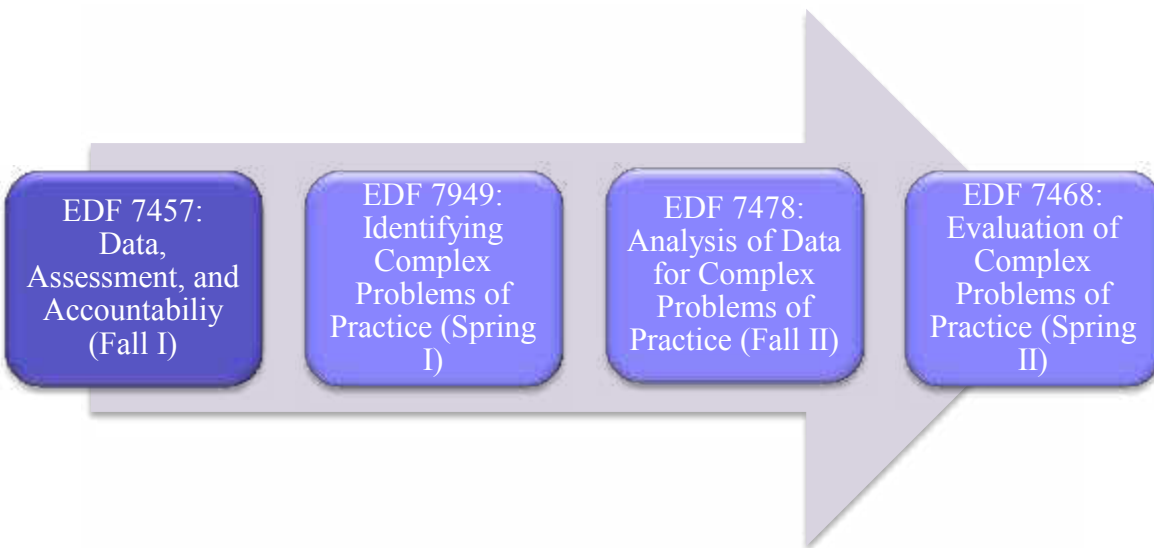
Figure 2: Redefined Ed.D. in Curriculum and Instruction Research Continuum Courses at UCF

Data Collection Methods

In order to accomplish the Dissertation in Practice goals, program and individual course information data were collected from a variety of sources. Dr. Thomas Vitale, Ed.D. Program Coordinator, provided the existing Ed.D. in Curriculum and Instruction program goals and objectives, while individual course information was obtained from in-person individual meetings, ongoing conversations with research course faculty members, UCF's Learning Management System (LMS), Canvas, and existing course syllabi. Additionally, I was also added as a "designer" or "observer" through the LMS to ensure full access to each individual research course, allowing me to record any course component modifications that took place after the initial meetings. Last, I used the curriculum map information template (see Appendix D) to create four individual course templates for each course using Google Docs, facilitating the collaborative, editing, sharing, and updating processes. The Ed.D. Program objectives were uploaded to a Google Docs document, and the information gathered from the informational meetings and ongoing conversations with faculty members, Canvas, and existing syllabi were also entered into their corresponding Google Docs and shared with the respective faculty members.

I first met with Dr. Carolyn Hopp, who is currently teaching EDF 7457, Data, Assessment and Accountability, for the first time. During our meeting we discussed the overall goals and vision for this first course in the research continuum. As it name indicates, and based on personal experience in the course, EDF 7457 focused on the history, conceptualization, and methodology for data analysis, assessment, and accountability methods employed in the K-12 Florida Public School Districts. Likewise, it also delved into the analysis of nationwide and worldwide standardized tests and reporting agencies. Given that EDF 7457 was now being

considered the first course in the research course sequence, it was clear that the course needed to be restructured.

As the foundational inquiry course, EDF 7457 should use the concept of Inquiry as Practice to ensure the preparation of scholarly practitioners to study complex problems or practice from multiple perspectives, with the aim of developing innovative solutions (Bengston et al., 2014; CPED, 2015c). During our meeting, Dr. Hopp shared that she had designed the course around the concept of "Problem of Practice" so that graduate students would understand what a complex problem of practice is, how to identify it, and the importance of context and positionality of the action researcher and qualitative writing in preparation for the DiP (personal communication, November 5, 2015). Likewise, she aligned the course with Dr. Michelle Gill's course, EDP 7517, Facilitating Development and Motivation, where the gap analysis project is assigned, in order to include and reinforce elements of the gap analysis summative assessment project (C. Hopp, personal communication, November 5, 2015). Dr. Hopp added me as an observer to her course in Canvas, hence granting me access to full course information and updates. The current course objectives, modules, and formative and summative assessments for EDF 7457 can be found in Appendix F. At a later meeting with Dr. David Boote, Dissertation Committee Chair, course faculty, and former Ed.D. Program Coordinator, I was informed that the initial gap analysis summative assessment previously done in Dr. Gill's course (first core course) would now be a part of EDF 7457 (personal communication, February 3, 2016). This fact was taken into consideration during the learning outcomes redefinition and curriculum design process for the course.

After meeting with Dr. Hopp, I proceeded to meet with Dr. Bonnie Swan, faculty instructor for EDF 7468, Evaluation of Complex Problems of Practice, which is the final course

in the inquiry continuum. During our conversation, she discussed her goals and vision for the course and shared that she wanted to incorporate some changes into the curriculum, specifically those addressing identified gaps from previous inquiry courses (personal communication, November 5, 2015). Similarly, I suggested the integration of education technology into the assessments, and modification of the curriculum to increase learner access to information and productivity skills. Dr. Swan has been the instructor for the course for several years and has constantly revised and adjusted its content to better align with the Professional Practice Doctorate goals.

Given that EDF 7468 is the last course of the research course sequence, careful attention must be paid when redefining the course learning outcomes and curriculum following the aforesaid sequential/integrated model as defined by Manathunga et al. (2004) and taking into consideration a spiral curriculum model to ensure that graduate students revisit systematic and disciplined inquiry principles of increasing complexity throughout the program (Bruner, 1960). Dr. Swan added me as a designer for her course in Canvas, thus facilitating the curriculum redesign process and enabling me to keep abreast of any changes made to the course content and sequence. The current course objectives, modules, and formative and summative assessments for EDF 7468 can be found in Appendix F. In addition, I also met and spoke over the phone with Dr. Swan in several instances throughout the learning outcomes redefinition and curriculum redesign process, collaborating and sharing ideas about the direction of the course.

Course data for the second and third courses of the research continuum, EDF 7949, Identifying Complex Problems of Practice, and EDF 7478, Analysis of Data for Complex Problems of Practice, were obtained from ongoing personal communications with Dr. David Boote and from the most current extant syllabus for the course. Dr. Boote has been teaching EDF

7949 for several years and has developed the course using a mixed methods approach to prepare advanced professional practitioners to appropriately apply and use both quantitative and qualitative methods to analyze and solve complex problems of professional practice. Further, his contributions to the Ed.D. program have been instrumental in the design of EDF 7949, as well as all other research continuum and core courses. Dr. Boote also added me as an observer through Canvas to have unrestricted access to course information. Information for EDF 7478 was obtained via the existing course syllabus. However, Dr. Boote shared that the course was being restructured to better align with the applied nature of the professional practice program (personal communication, November 5, 2015), ensuring that the mixed methods inquiry courses would be designed taking into consideration real-world, data-oriented approaches to develop interest in graduate students and support the growth of statistical reasoning skills (CPED, 2015d; Leech & Haug, 2015; Shaughnessy, 2003). In addition, he shared that due to scheduling circumstances, he may also teach all or part of EDF 7478 in the upcoming semesters (personal communication, January 20, 2016). The current course objectives, modules, and formative and summative assessments for EDF 7479 and EDF 7478 can be found in Appendix F.

Design Frameworks, Models, and Principles

The clarification of the Ed.D. in Curriculum and Instruction program goal and objectives and development of instructional objectives and learning outcomes for research courses and the course curriculum maps were carried out using a systematic approach. To that effect, this section describes the array of curriculum design frameworks, models, and principles used to fulfill each of the Dissertation in Practice goals outlined in Table 2. Even though the following design choices and solutions informed the entire design-based study, this chapter details the process

used to address Goals 1 and 2; Chapter 4 discusses choices made for the curriculum development of individual research courses.

User-Centered Design

Applying universal principles of design allows for the consideration of the types of diverse end-users who will be using the educational product to be developed. These principles facilitate the customization of the designed curriculum to the changing needs and readiness levels of both educators and learners. Lidwell et al. (2010) provided a set of principles, laws, guidelines, and general design considerations from a variety of design disciplines applicable to curriculum design to ensure a successful design. Similarly, the Universal Design for Instruction (UDI) approach, which originated in the field of architecture, suggests the use of principles to guide the design and revision of curriculum, instruction, and assessment to benefit a broad range of learners (UCONN-UDIOP, 2009). The following are the user-centered design principles that I used during the curriculum mapping and design process, taking into consideration a variety of instructors and learners.

Personas

The use of personas is a technique that relies on the creation of fictitious curricula end users to guide the decision-making process of curriculum design. It involves creating profiles for a small number of representative users, where each profile represents a combination of a subpopulation of learner and instructor groups (Lidwell et al., 2010). These profiles are then used to customize the curriculum by incorporating implementation strategies for instructors and tailoring the curriculum to the learners' needs, abilities, and interests. The following personas were created to inform the curriculum design and mapping process as it pertains to the three goals of this study.

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<u>Student Personas</u>

All Ed.D. in Curriculum and Instruction graduate students must have earned a master's degree and have a minimum of three years of experience in the field (UCF, 2015). Likewise, they must submit acceptable GRE or GMAT scores per UCF's policy, TOEFL or IELTS scores for international students, and a goals statement to convey the applicant's writing ability (UCF, 2015). Thus, students admitted to the program must be advanced professional educators who have experience as teachers, administrators, or similar education-based positions and can demonstrate doctoral level writing ability. However, students admitted to each cohort do come from different specialty backgrounds and organizations and possess varying levels of professional experience.

Amelia has served as an elementary school teacher for the past four years at a local School District. She holds a Master of Arts in Reading and Literacy degree and is a very strong writer. However, she has never taken any graduate research courses and has no affinity for mathematics, which also makes her very anxious. Consequently, she lacks much of the foundational qualitative and quantitative methods knowledge that would support her learning during the research course continuum courses in the Ed.D. in Curriculum and Instruction program.

Thomas has served as a high school Economics teacher for the past eight years at a private K-12 school. He holds a Master of Arts in Political Science degree, and while he does not seek out research classes, he has taken a few to support his studies and has shown affinity for quantitative analysis. Thus, he has some foundational qualitative and quantitative methods knowledge and looks forward to taking the research continuum courses in the Ed.D. in Curriculum and Instruction program.

Last, *Marissa* teaches engineering courses at Valencia State College and uses a variety of productivity and application software at her job, and she is also a strong writer. Marissa earned a Master of Science in Materials Engineering degree and has published mixed-methods peer-reviewed papers. Consequently, she has a strong foundation in both qualitative and quantitative methods and looks forward to challenging learning opportunities in the research continuum courses of the program.

Faculty Personas

All instructors of record for the research continuum courses must possess a doctoral degree from an accredited institution. This scenario could consider the possibility of having a GTA (Practicing Dr.) that may teach some units if his/her background for the units resembles "Dr. Ideal's" background and either Dr. Ideal is not available or Dr. Practice or Dr. Research delegates units to him/her.

Dr. Ideal has extensive expertise and experience in both quantitative and qualitative research methods, qualitative writing, and the literature review process and has published a large body of peer-reviewed articles. This individual has professional experience in the K-12 arena, either as a teacher or administrator, where he used and analyzed data successfully for school improvement efforts and accountability purposes. Later in his career, he transferred to the higher education arena and has taught a multitude of courses, including both qualitative and quantitative research courses. Likewise, he has a strong background in a variety of disciplines as well as in teaching and learning. Thus, he has an in-depth understanding and knowledge of the modification of traditional research courses to applied research as it pertains to the needs of professional practitioners in the Ed.D. program.

Dr. Practice (& *Practicing Dr.*) also has a doctoral degree; however, she has spent most of her career serving in the K-12 arena and has more experience carrying out qualitative rather than quantitative research. She started as a teacher and then moved to leadership positions within the School District system, independent schools, or other learning organization involving school assessment and accountability. Dr. Practice is an Instructor for both the Ed.D. in Curriculum and Instruction and the Ed.D. in Educational Leadership programs. Even though both programs seek to prepare scholarly practitioners, the Ed.D. in leadership research courses tend to follow a more Ph.D.-like course syllabus than the applied nature of the Ed.D. in Curriculum and Instruction. As a result, it could be easy for her to revert to a higher education culture, leaving behind the K-12 experience that she was supposed to embed in the Ed.D. in Curriculum and Instruction research continuum courses.

Practicing Dr. is still working on her Ed.D. degree but has substantial expertise working with K-12 qualitative and quantitative data, and she holds a leadership position within the School District system. Although she has not had the opportunity to publish peer-reviewed articles, she is very knowledgeable in applied research skills and inquiry for improvement methods for professional practitioners and could lead one or more class sessions and support students by serving as a GTA for the research continuum courses.

Finally, *Dr. Research* has served only as a higher education instructor throughout his teaching career. He has been a statistics college Professor for over 15 years and has been teaching research courses for Ph.D. programs at UCF. Although Dr. Research is very knowledgeable in quantitative methods, has published a plethora of peer-reviewed articles, and does a very good job of teaching traditional research courses, he has very little to none K-12 cultural background and practitioner experience, and he believes that research course curricula

should be the same for both Ph.D. and Ed.D. programs. Further, he believes that research courses should mainly address quantitative methods and literature review units should be a part of the core courses rather than the research continuum.

Consistency

Consistency refers to the increased usability and learnability of systems when similar parts are expressed in similar ways, as it enables people to transfer knowledge to new contexts with more efficiency. Curriculum design has to show aesthetic, functional, and both internal and external consistency to be easily recognizable by stakeholders, and it should be simple to use, revise, maintain, and learn in order to support teaching and learning (Lidwell et al., 2010). The consistency principle was applied throughout the curriculum design and mapping process, to ensure the same design principles based on Inquiry as Practice (CPED, 2015c) were used for courses following the Understanding by Design (UbD) format (Wiggins & McTighe, 2005), Anderson and Krathwohl's (2001) Revised Bloom's taxonomy for objectives, and the same mapping methodology (Jacobs, 2004; UCONN, 2015).

Equitable Use, Flexibility, and Instructional Climate

The principle of equitability was used to ensure that the curriculum would be useful and accessible to all learners by providing the same means of use. On the other hand, the principle of flexibility suggested the incorporation of multiple instructional methods into the curriculum to accommodate a wide range of learner abilities and increase its accessibility. Finally, the principle of instructional climate was considered, as it proposes an instruction that is inclusive and welcoming, while promoting interactions and collaborations among instructors and learners, which is representative of the necessary skills for advanced practitioners (UCONN-UDIOP, 2009). The curriculum was designed to be relevant and academically rigorous, fostering critical

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thinking and problem solving, and appropriately challenging for individual learners or groups of learners in agreement with the process of Inquiry as Practice and its integral role in the development of the scholarly practitioner (Bengston et al., 2014; CPED, 2015c).

Constraint and Control

The principle of constraint is a technique to limit the actions that can be performed to a system. The use of constraints during the curriculum redesign process simplifies instructor usability and minimizes errors by clearly defining the intended goals, objectives, pedagogies, and assessments for the intended research continuum curriculum. Likewise, the level of curricular control should be related to the proficiency and experience of the user (Lidwell et al., 2010). The degree of constraint and control over the proposed curriculum will vary according to the readiness level of the user in terms of the needs of advanced professional practitioners. As expertise and familiarity increases, the level of constraint decreases and the level of control increases. This connection will be shown by the amount of detail provided in the curriculum in terms of scope, sequence, instructional methods, activities, and assessments.

Spiral Curriculum

A spiral curriculum is one where topics are revisited and reconstructed iteratively throughout the course of program, requiring the deepening and mastering of the topic being studied before building new knowledge (Bruner, 1960; Harden & Stamper, 1999). Given that the continuous revision of subjects is central to integrated and problem-based learning (Harden & Stamper, 1999), the spiral curriculum approach was selected and used during the Ed.D. in Curriculum and Instruction curriculum redesign and mapping process. Bruner (1960) further posited that the spiral curriculum should "be structured around the great issues, principles, and values that a society deems worthy of continual concern of its members" (p. 52). Hence, the

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choice of using a spiral curriculum for the research course continuum redesign is also well aligned with the study of complex problems of professional practice, which are significant and of concern to the members of learning organizations.

Harden and Stamper (1999) described the following featured as characteristic of spiral curriculum:

1. Topics are revisited: students progressively and iteratively revisit topics, themes, or entire subjects during a given course or program (Harden & Stamper, 1999).

2. There are increasing levels of difficulty: as topics are revisited throughout course sequences or program, these are addressed in successive levels of difficulty. Each revision will present new challenges and opportunities, bringing more advanced applications and increased expertise (Harden & Stamper, 1999).

3. New learning is related to previous learning: new information learned is linked to previously learned material, which is a prerequisite for advancement (Harden & Stamper, 1999).

4. The competence of students increases: each revision increases the proficiency of students (Harden & Stamper, 1999).

Likewise there are several advantages to utilizing a spiraling curriculum. Special attention is directed to the scope and sequence of course topics according to higher levels of complexity, given that a spiral curriculum requires higher-level objectives for each revision, it is flexible, it reinforces concepts, and it promotes integration (Harden & Stamper, 1999). It follows then that the use of a spiral curriculum also aligns well with the constructivist learning model, which postulates that curriculum be designed in a way that reflects the actual complexity of the environment in which learners will function (Savery & Duffy, 1996). Also, it is consistent with

the core tenets of the apprenticeship model, in which activities and situations are central to cognition and learning (Brown et al., 1989).

CPED Working Principles and Design Concepts

As a founding member of the CPED Consortium, UCF must follow CPED Design Concepts (CPED, 2015c) and guidelines. CPED (2015d) believes that "the professional doctorate in education prepares educators for the application of appropriate and specific practices, the generation of new knowledge, and the stewardship of the profession" (para. 4). Accordingly, the Ed.D. in Curriculum and Instruction program goals, objectives, and research course outcomes were redefined to clearly embody these core tenets. Likewise, the CPED (2015d) Working Principles were used as a guiding framework in the redesign and curriculum mapping process. For purposes of this DiP, which focuses on the research continuum, Working Principles 4 and 5 were primarily used during the goal, objectives, and outcomes development process:

4. Provides field-based opportunities to analyze problems of practice and use multiple frames to develop meaningful solutions.

5. Is grounded in and develops a professional knowledge base that integrates both practical and research knowledge, that links theory with systemic and systematic inquiry.

These two principles were emphasized during the redefinition and curriculum mapping process as they clearly highlight the need to design research courses that use both qualitative and quantitative methods and are specifically and intentionally developed for practitioner use (Bengston et al., 2014; CPED, 2015c, 2015d; Perry, 2015). Thus, the design methodology employed maintained an applied research and practical theory approach, resulting in the rigor and prestige that the Ed.D. in Curriculum and Instruction program deserves (Shulman et al., 2006).

The curriculum redesign and mapping process was carried out to support the development of the Scholarly Practitioner (CPED, 2015c). Given that the Scholarly Practitioner must be able to "blend practical wisdom with professional skills and knowledge to name, frame, and solve problems of practice" (CPED, 2015c, para 2), inquiry must play a central role in the learning process (Bengston et al., 2014; Perry, 2015). However, because the Ed.D. in Curriculum and Instruction program focuses on existing problems of professional practice in specific contexts, the use of inquiry will aid the scholarly practitioner to inform and find innovative solutions for those problems (Belzer & Ryan, 2013; Bengston et al., 2014). Consequently, Inquiry as Practice was used as the central framework for the curricular redesign and mapping of the research continuum, thus ensuring that students are able to "gather, organize, judge, aggregate, and analyze situation, literature, and data with a critical lens" (CPED, 2015c, para 4).

Goal 1: Clarifying Program Goals, Objectives, and Research Continuum Learning Outcomes

Ed.D. Program Goals and Objectives

Logic models provide visual representations of inputs, activities, outputs, and outcomes of a program and are consequently used in program planning and evaluation (Fitzpatrick et al., 2011). Under this premise, the logic model I developed for the sequence of research courses for the program (see Appendix A) was used to guide both the program and research continuum goals and objectives redefinition process. In addition, the above-mentioned CPED (2015d) Working Principles and Design Concepts were also used to inform the design process.

Since the primary focus of this DiP is the research course sequence redesign, I started by writing overall learning outcomes for each individual research course as shown in Table 9. The developed overall learning outcomes seek to clearly reflect the central role of Inquiry as Practice throughout the research course continuum, the applied nature of the mixed methods courses for

practitioners centered around identifying and solving complex problems of practices, and the

spiral curriculum principles informing the process in order to ensure mastery of objectives

throughout the program.

Table 9: Ed.D. in Curriculum and Instruction Research Continuum Overall Learning Outcomes

Course	Overall Learning Outcome
	Students will use practical research and applied theories to:
EDF 7457 - Data, Assessment & Accountability	Demonstrate proficiency in examining organizational contexts through multiple lenses to identify potential problems of practice and propose solutions utilizing Inquiry as Practice, grounded in theoretical and practical research.
EDF 7494 - Identifying Complex Problems of Practice	Demonstrate advanced understanding of conceptual, ethical, and mixed methods regarding research and complex problems of practice and their identification, as well construct a sophisticated synthesis of literatures to support it.
EDF 7478 - Analysis of (Data for) Complex Problems of Practice	Demonstrate mastery of applied qualitative and quantitative research methods to analyze data to support decision-making about changes that result in improvement of complex problems of practice at an organization.
EDF 7468 - Evaluation of Complex Problems of Practice	Demonstrate comprehensive knowledge of evaluation standards, methodologies, and practices to determine the success of a program and build capacity at an organization.

Once the overall learning outcomes were determined for each individual research course,

I used them to inform the Ed.D. in Curriculum and Instruction program goal and objectives

clarification process. As previously mentioned, the program goal was also redefined taking into

consideration the CPED (2015d) Working Principles and Design Concepts, as well the expected

short-term, intermediate, and long-term outcomes as shown on the Ed.D. in Curriculum and

Instruction program logic model. Table 10 contains the clarified Ed.D. in Curriculum and

Instruction program overall goal.

Table 10: Ed.D. in Curriculum and Instruction Original and Redefined Program Goals

Original goal	Redefined goal
Students in the Ed.D. Education program should be able to critically examine complex problems of educational practice in context from multiple perspectives with the goal of effecting change.	The Ed.D. in Curriculum and Instruction program will prepare scholarly practitioners to critically examine complex problems of educational practice in context through the use of Inquiry as Practice for continuous improvement, with the aim of designing innovative solutions that will effect positive change.

Goals are broad, general statements of what a program intends to achieve, and they provide a framework for determining the program objectives and learning outcomes (UCONN, 2015; Wiggins & McTighe, 2005). Since the aim of the Ed.D. in Curriculum and Instruction program is to prepare educators to become scholarly practitioners who can systemically and systematically use Inquiry as Practice to solve complex problems of practice (CPED, 2015c), the clarified program goal seeks to embody this core tenet, as well as to distinctly highlight that scholarly practitioners will acquire the necessary research skills in the program to design the most innovative solutions for complex problems of practice.

The inclusion of the innovation component ensures that the program focuses on the preparation of 21st-century global teaching and learning leaders, who are adept at the most state-of-the-art and cutting-edge solutions, to include the correct application and integration of digital technologies. Also, the overall Ed.D. in Curriculum and Instruction program objectives were clarified following the CPED (2015d) Working Principles and Design Concepts, model for improvement principles, the Ed.D. in Curriculum and Instruction program aim, and the UCF

(2015) mission and vision to ensure complete alignment with the redefined program goal and the

overall course learning objectives (see Table 11).

Table 11: Ed.D. in Curriculum and Instruction Original and Redefined Program Objectives

Original objectives	Redefined objectives
Upon completion of the Ed.D. Professional Practice Doctorate Program, students will be able to independently:	Upon successful completion of the Professional Practice Ed.D. Program, graduates will be able to independently:
1. Identify and understand issues of learning, development, motivation, and organizational theory	1. Identify and understand issues of learning, development, motivation, and organizational theory.
2. Infer, interpret, and critically examine complex problems of educational practice in context through multiple perspectives	2. Name, frame, and critically examine complex problems of educational practice through multiple perspectives.
3. Evaluate complex problems of educational practice in context	3. Engage in systematic inquiry to analyze complex problems of educational practice.
4. Propose and implement data-driven decisions to effectuate change for complex problems of educational practice in context	4. Design, develop, and implement innovative solutions to complex problems of practice.
5. Collect and analyze appropriate data for complex problems of educational practice in context	5. Apply the principles of improvement science and evaluation to build organizational capacity and effect practice/program improvement.
6. Create a positive impact on an organization, employer, or community as an "agent of change" based on Ed.D. knowledge gains	6. Use evaluative inquiry to assess various alternative solutions to complex problems of practice and determine the most suitable one.
	7. Create a positive impact on an organization, employer, or the community as an agent of change.
	8. Acquire advanced specialized knowledge and skills in a particular area of educational practice.
	9. Value the application of theory in practice to address questions of equity, ethics, and social justice surrounding critical issues in education.

The Ed.D. program goals and objectives redefinition was an iterative process; constant revisions and adjustments were made throughout the curriculum redesign and mapping process. These modifications were a byproduct of conversations with Dr. David Boote, course changes implemented during the design process, and data collected, to better represent the Ed.D. in Curriculum and Instruction program overall goals.

The addition of EDF 7457, *Data, Assessment and Accountability*, and the incorporation of innovative teaching and learning practices into the research continuum prompted the careful redesign of the research course sequence content. As such, the overall Ed.D. in Curriculum and Instruction program objectives were also redefined to accurately reflect these changes. Program objectives 1-5 were revisited to clearly describe how the Scholarly Practitioner would develop professional wisdom and utilize Inquiry as Practice to innovatively solve complex problems of practice (CPED, 2015c), as described in the newly redefined objectives 1-4. In addition, the new research continuum curriculum map was redesigned using improvement science principles, integrating the most recent education policy and research for the advancement of teaching (CFAT, 2015) in order to stress the eminent role that the application of evaluative inquiry and capacity building play in the preparation of advanced professional practitioners as designated in redefined objectives 5-6. Original objective 6 was left unaltered as objective 7; however, redefined objective 8 was added to capture the specific knowledge, skills, and attitudes that graduates would acquire through their specialization courses. Finally, redefined objective 9 was included to address CPED (2015d) Working Principle 1 and focus on affective learning objectives in the program, as representative of a whole student pedagogical approach. Program objective 9 is intentionally marked in a lighter font color (like this) to indicate that it will be not

be included in the curriculum redesign or mapping process, as it is not directly related to the research course sequence, which is the focus of this DiP.

Research Course Sequence Objectives

As outlined at the beginning of this chapter, in order to clarify and redefine individual research course sequence overall objectives and learning outcomes, preliminary course information was obtained via personal meetings and electronic correspondence with individual research continuum faculty, Canvas course contents, and analysis of existing course syllabi. Information obtained was recorded on curriculum map information sheets for each course (see Appendix F). The use of curriculum map information sheets ensures alignment between instructional goals, pedagogies, and assessments and provides a visual representation of the current curriculum that can be adapted to student needs in subsequent revisions (Jacobs, 2004, 2006).

A thorough review of the existing course syllabi and Canvas course information was conducted prior to meeting with each research course faculty member. Data gathered during the initial examination were recorded on the corresponding curriculum map information sheet in Google Docs to facilitate sharing and collaboration with each professor. Course data collected included course contents, skills, learning objectives, formative and summative assessments, and essential questions. These were organized by semester month, week, and module when available. Information that was not available was left blank. Any questions were inserted as a comment in the document, to be addressed during the meeting. Lastly, the Google Docs document was shared with each faculty member to guarantee consistency and make sure that all the information was being collected and processed correctly.

Individual meetings took place in each faculty member's office at mutually agreed times and dates, to discuss in detail the contents of the curriculum map information sheets and the Canvas LMS course contents. Correspondingly, possible existing gaps and redundancies in course curricula were discussed and noted. Some faculty members were teaching some of the courses for the first time, and as a consequence some of the courses experienced curriculum, instruction, and assessment changes that directly impacted the course design and contents, which were evident from the data collected. In addition, faculty members shared their views and beliefs about each particular research course, changes that needed to be incorporated that would result in improvements for learning, and the need to redefine and align the four courses in the research continuum.

After sufficient data were collected for each research course, the information obtained was thoroughly examined to identify possible gaps and redundancies, which are addressed in more detail under Goal 3 (see Table 12). The identified possible gaps and redundancies were used during the curriculum redesign and mapping process to fulfill Goals 2 and 3 of this DiP and during the individual course objective redefinition for Goal 1. Existing course objectives shown in Appendix F, as well as the overall research continuum learning outcomes (see Table 9) were used as the foundation for the clarification process. Some of them were modified slightly or combined to systematically align with the overall course learning outcomes and the Ed.D. in Curriculum and Instruction program goal and objectives and to address identified redundancies.

Table 12: Research Continuum Possible Gaps and Redundancies

Course	Possible gaps noted	Possible repetitions/redundancies
EDF 7457: Data, Assessment and Accountability	• Introduction to systematic inquiry for practitioners • Introduction to applied research, types, methodologies • Program theory/logic model • Assessment Methods	• Summative Assessment (gap analysis)
EDF 7494: Identifying Complex Problems of Practice	• Bridge gap to evaluative inquiry/improvement science • Assessment Methods	• Summative Assessment (gap analysis)
EDF 7478: Analysis of Data for Complex Problems of Practice	• Literature Review Component • Mixed Methods approach: qualitative data analysis • Applied quantitative research skills: Excel vs. SPSS • Authentic Summative Assessment • Design-based framework	
EDF 7468: Evaluation of Complex Problems of Practice	• Capacity building (emphasis)	• Research types and methodologies

The objective redefinition process was carried out by applying the two-dimensional taxonomy for learning, teaching, and assessing developed by Anderson and Krathwohl (2001). This framework redefines the cognitive domain as the intersection of the Knowledge Dimension and the Cognitive Process Dimension. The Knowledge Dimension contains four categories

(factual, conceptual, procedural, and metacognitive) that lie along the continuum from concrete to abstract. In contrast, the Cognitive Process Dimension contains six categories (remember, understand, apply, analyze, evaluate, and create) in increasing order of complexity (Anderson & Krathwohl, 2001).

Additionally, objectives were clarified, taking into consideration what graduate students need to learn in the time available, instructional activities that would result in higher levels of learning, the design of authentic assessments, and alignment between objectives, instruction, and assessment (Anderson & Krathwohl, 2001). Each research course objective is a statement that contains a verb describing the targeted cognitive process and a noun describing the type of knowledge students are expected to construct (Anderson & Krathwohl, 2001). Therefore, this organizing framework for the development and classification of measurable objectives increases the precision of learning objectives and promotes understanding of intended learning outcomes. Careful consideration was taken to include learning objectives encompassing all different kinds of learning outcomes intended using Anderson and Krathwohl's (2001) taxonomy, as well as affective, psychomotor, and experiential knowledge when applicable.

The development of overall instructional objectives (see Table 13) and redefinition of learning outcomes (see Table 14) were intentionally done to address specific end-user needs. Instructional objectives are statements that guide instruction derived from program goals or standards (Anderson & Krathwohl, 2001; UCONN, 2015). They are brief, clear statements that describe the desired learning outcomes of instruction. Goals, standards, and objectives use the language of outcomes, but objectives are more specific. Learning outcomes are statements that describe significant and key learning that students have achieved and can demonstrate by the end of the program, course, or academic year (UCONN, 2015). In other words, instructional

objectives are teacher centered, as they are written from an instructor's perspective, while learning outcomes are more student centered, as they describe what learners should learn. Therefore, instructional objectives and learning outcomes were developed taking into consideration the formerly identified faculty and student personas, informing both teaching and learning practices. Likewise, the design allows for scaffolding of individual learning outcomes into sub-enabling outcomes or objectives and their classification (Pratt, 1994) to facilitate the incorporation of differentiation strategies (CAST, 2012) in agreement with the predetermined personas.

Table 13: Research Continuum Overall Instructional Objectives

Research Continuum Course	Overall Instructional Objectives Students will be able to independently use their learning to:
EDF 7457	- Understand and apply the principles of systematic inquiry and program theory to identify and study a complex problem of professional practice. - Apply gap analysis principles to develop and present a case study to address a complex problem of practice at a learning organization. - Relate the gap analysis approach to design-based research and evaluative inquiry
EDF 7494	- Understand conceptual, ethical, and methodological issues regarding complex problems of practice and research. - Synthesize published research, supporting their development as evaluative inquirers. - Apply basic qualitative and quantitative data analysis methods, and critically assess their usefulness and appropriateness to study issues in education.
EDF 7478	- Understand the connection between program theory and improvement science. - Use qualitative and applied quantitative analysis to establish the need for organizational "change" and to determine the effectiveness of the implemented change(s) for results in the desired improvement. - Create, develop, and implement an improvement initiative to address a complex problem of practice at their learning organizations.
EDF 7468	- Understand the basic principles, approaches, methodologies, data analysis, and dissemination of findings in program evaluation design. - Synthesize published research and other readings to support their understanding of the discipline and profession of evaluation. - Design an evaluation plan to determine the success of a program at an organization using the most appropriate evaluation methodologies

Table 14: Individual Research Course Learning Outcomes

Research Course	Learning Outcomes Students can:
EDF 7457	- Define systematic inquiry. - Differentiate between the main types of research designs. - Distinguish traditional research from action research. - Engage in the study of problems of practice. - Examine individual work contexts and actions required. - Understand and describe positionality and its complexity. - Situate the problem of practice within the context of the organization. - Create an annotated bibliography to inform a problem of practice. - Use the annotated bibliography to develop a detailed description of the program and its significance. - Create a Logic Model for the program/unit being evaluated. - Define short-term, intermediate, and individual performance measurable goals to determine the existing gaps. - Differentiate between quantitative and qualitative methods. - Demonstrate proficiency in following qualitative research protocols - Use quantitative/qualitative data to support the existing gap. - Use education technology applications and productivity tools to process, display and analyze data and document academic growth. - Identify knowledge, motivational and organizational causes of gaps using research-based theories to support them. - Determine innovative knowledge, motivational and organizational solutions for closing the gap grounded in theoretical and practical research. - Develop an evaluation plan using Kirkpatrick's Four-Level Evaluation model for the proposed gap solutions. - Understand the connection between gap analysis and evaluative inquiry. - Value the applicability of systematic inquiry to examine complex problems of practice at learning organizations. - Communicate written professional opinions in a scholarly manner, as defined by APA guidelines.

Research Course	Learning Outcomes Students can:
EDF 7494	• Demonstrate integrity in data collection and analysis, avoiding fabrication, falsification, omission, or manipulation.* • Understand and apply ethical principles for research with human participants. * • Demonstrate personal integrity in academic settings, avoiding conflicts of interests (both personal and financial), integrity during examinations, and using respectful and professional interpersonal behavior. * *RCR/Ethics designated objective • Understand and apply basic principles of testing, measurement, interviewing, and surveying. • Use data to identify and understand problems of practice. • Identify problems in professional practice that require additional study. • Understand and apply basic descriptive statistics. • Use education technology applications and productivity tools to process, display and analyze data and document academic growth. • Identify, understand, and critique published research to formulate sound inferences grounded on data and the literature that support professional practice. • Construct a review of literature focused on a complex problem of practice. • Appropriately attribute authorship (avoiding plagiarism and self-plagiarism) and authorship credit. • Communicate professional opinions in a scholarly manner, as outlined by APA guidelines. • Value the applicability of mixed methods to evaluate a complex problem of practice and change. • Use inquiry as practice to carry out a gap analysis of a case study at a learning organization. • Understand how the use of evaluative inquiry leads to effect continuous improvement.

Research Course	Learning Outcomes Students can*:*
EDF 7478	- Define "change" and "improvement" in the context of improvement science. - Create a Logic Model for the program/unit being evaluated. - Articulate how the framework for the Model for Improvement can be used to turn ideas into action and learning. - Use the PDSA (Plan-Do-Study-Act) cycle to build profound knowledge and test/implement a change that can be applied to practice for improvement. - Apply literature review principles (appropriateness, timeliness, scholarliness) to support the "planning stage" in an improvement initiative. - Apply suitable qualitative research methods to collect, analyze, and present data that will inform the improvement decision process. - Apply suitable applied quantitative research methods to collect, analyze, and present data that will inform the improvement decision process. - Use education technology applications and productivity tools record, document, analyze and disseminate findings. - Understand the connection between improvement science and evaluative inquiry. - Value the applicability of improvement science to address complex problems of practice at learning organizations.

Research Course	Learning Outcomes Students can*:*
EDF 7468	• Understand the history, influences, and evolution of evaluation across disciplines. • Understand classic, current, and new directions for research on evaluation. • Differentiate between formative and summative evaluations. • Differentiate between internal and external evaluation/evaluators. • Apply evaluation standards to identify political, social, ethical, and methodological problems in professional practice necessitating further investigation. • Examine and critique the conceptual distinctions between contemporary theories of evaluation practice. • Identify and critique published evaluation studies and formulate sound inferences grounded on data. • Apply advanced research skills to acquire peer-reviewed research to support professional practice. • Identify and describe a complex problem of practice to be evaluated. • Plan a formative/summative evaluation utilizing principles of program theory and effective evaluation practices. • Use education technology software applications and productivity tools to process, display, and analyze data, and document academic growth. • Demonstrate understanding of sound research methodology, evaluation, and dissemination of findings. • Identify what quantitative and qualitative data must be collected to address evaluation questions. • Report evaluation results to maximize use and understanding. • Communicate professional positions in a scholarly manner in both written (APA Publication Manual) and oral modalities. • Value the applicability of evaluative inquiry to effect program improvement.

Instructional objectives and learning outcomes were also composed by applying a spiral curriculum model, so that topics would be iteratively reconstructed along the research continuum, allowing for in-depth understanding and mastery of a particular topic before building new knowledge (Bruner, 1960; Harden & Stamper, 1999). As a result, outcomes clearly delineate how topics are revisited and built upon throughout the four courses, with increasing level of difficulty, using prior knowledge as foundation, and increasing the competency of students (Harden & Stamper, 1999).

Goal 2: Research Course Sequence Alignment Matrices

The clarified Ed.D. in Curriculum and Instruction program goal and objectives, the developed individual research course sequence overall instructional objectives, and the redefined learning outcomes were used to collect additional data about the operating Ed.D. in Curriculum and Instruction curriculum at UCF. By creating curriculum alignment matrices, it was feasible to identify where program objectives and learning outcomes were being addressed within the curriculum, providing a clear understanding of what students do in their courses and what faculty members expect them to learn (UCONN, 2015). Furthermore, the development of curriculum maps facilitated the identification of possible existing gaps and redundancies, so that they could be addressed during the individual course curriculum redesign using backward design to improve student learning (Jacobs, 2004; Uchiyama & Radin, 2009; UCONN, 2015; Wiggins & McTighe, 2005).

Table 15 shows the curriculum alignment matrix for the research continuum, which I developed to determine the alignment of individual research courses with the clarified Ed.D. in Curriculum and Instruction program objectives. This map was used to ensure that the broad organizational intended outcomes are established first, followed by the use of backward design

principles to establish program, course, unit and lesson outcomes, so that when the program or

course is delivered learners experience the system in reverse (UCONN, 2015). As a result,

learning accumulates as students progress through the research continuum courses, as they are

exposed to a coherent set of experiences leading to the development of the desired knowledge

and skills (UCONN, 2015).

Table 15: Overall Curriculum Alignment Matrix for the Research Continuum

Course	P.O # 1	P.O # 2	P.O # 3	P.O # 4	P.O # 5	P.O # 6	P.O # 7	P.O # 8
EDF 7457	I	I	I	I			I	N/A
EDF 7494	P	P	P	P	I	I	P	
LoP	D	D	D	P			D	
EDF 7478	P	P	P	D	P	P	P, D	
EDF 7468	P	P	D		P, D	P, D	P	
DiP	D	D	D	D	D	D	D	
I= introduced, P= practiced, D=demonstrated								

Adapted from Allen (2004)

Note. P.O. in boldface represents objectives addressed by the research continuum courses. Courses in gray are not included in the research continuum. P.O. = Program Objectives, as follows:

1. Identify and understand issues of learning, development, motivation, and organizational theory.
2. Name, frame, and critically examine complex problems of educational practice through multiple perspectives.
3. Engage in systematic inquiry to analyze complex problems of educational practice.
4. Design, develop, and implement innovative solutions to complex problems of practice.
5. Apply the principles of improvement science and evaluation to build organizational capacity and effect practice/program improvement.
6. Use evaluative inquiry to assess various alternative solutions to complex problems of practice and determine the most suitable one.
7. Create a positive impact on an organization, employer, or community as an agent of change.
8. Acquire advanced specialized knowledge and skills in a particular area of educational practice.

Even though all eight Ed.D. in Curriculum and Instruction program objectives were included in the curriculum alignment matrix, only the ones that correspond to the program's research continuum courses were highlighted and mapped to the research courses. Since program objectives 1-6 were used as a framework to develop the individual research course instructional objectives and outcomes, it was important to ensure that courses were aligned and articulated with them. The matrix clearly depicts where each program objective is being introduced, practiced, and demonstrated within the continuum. In order to better represent where the program objectives are being supported by the research courses and to confirm that they were being mastered and addressed with varying levels of complexity as is characteristic of a spiral curriculum (Bruner, 1960), the LoP and DiP courses, which are closely related to the research continuum, were also included. However, these are depicted in a lighter color, to differentiate them from the actual research course sequence. This matrix demonstrates that all program objectives, which are directly related to the research continuum, are indeed supported and are aligned. Likewise, it was also made evident that research courses are promoting the mastery of each program objective by providing multiple opportunities for practicing and demonstrating the required competencies.

The fact that each program objective is practiced and demonstrated at least twice throughout the research continuum and supporting courses also portrays the existence of meaningful and purposeful formative and summative authentic learner-centered teaching strategies, allowing students to build conceptions in a gradual manner and in increasing levels of difficulty (Brown et al., 1989; Bruner, 1960). No gaps were identified on this overall curriculum alignment matrix.

In order to continue the mapping process, I proceeded to prepare a course alignment matrix for each individual research course, to further identify where individual course learning outcomes supported the overall Ed.D. in Curriculum and Instruction program objectives and the expected program outcomes defined in the logic model (see Appendix A). Table 16 shows the course alignment matrix for EDF 7457, Data, Assessment, and Accountability. This first research continuum course has three overall instructional objectives:

1. Understand and apply the principles of Inquiry as Practice and program theory to identify and study complex problems of professional practice to effect change and improvement.

2. Apply gap analysis principles to develop and present a case study to address a complex problem of practice at an organization.

3. Relate the gap analysis approach to design-based research and evaluative inquiry.

Table 16: Course Alignment Matrix for EDF 7457

	P.O #1	P.O #2	P.O #3	P.O #4	P.O. #5	P.O. # 6	P.O. #7
L.O. 1	B		B				
L.O. 2		I	B		B		
L.O. 3			B	I			
L.O. 4	B	A	B	B		B	B
L.O. 5		B	B				
L.O. 6		I					
L.O. 7	B	A	I				
L.O. 8		I	I	I			
L.O. 9	I	I					
L.O. 10		B	B		B	B	
L.O. 11	I	I					
L.O. 12		B					
L.O. 13	I	I	I				
L.O. 14		B	B				
L.O. 15			I				
L.O. 16	A	I					B
L.O. 17				I		I	B
L.O. 18		I		I		I	
L.O. 19					B	I	
L.O. 20		A	I				
L.O. 21	I	A		I			

B = basic, I = intermediate, A = advanced expectation for outcome

Adapted from Allen (2004)

Note. Only P.O. addressed by the research continuum courses are included. P.O. = Program Objectives (refer to Table 11) and L.O. = Learning Outcomes, as follows:
1. Define systematic inquiry.
2. Differentiate between the main types of research designs.
3. Distinguish traditional research from action research.
4. Engage in the study of problems of practice.
5. Examine individual work contexts and actions required.
6. Understand and describe positionality and its complexity.
7. Situate the problem of practice within the context of the organization.
8. Create an annotated bibliography to inform a problem of practice.
9. Use the annotated bibliography to develop a detailed description of the program and its significance.
10. Create a Logic Model for the program/unit being evaluated.
11. Define short-term, intermediate, and individual performance measurable goals to determine the existing gaps.
12. Differentiate between quantitative and qualitative methods.
13. Demonstrate proficiency in following qualitative research protocols.
14. Use quantitative/qualitative data to support the existing gap.
15. Use education technology applications and productivity tools to process, display and analyze data and document academic growth.
16. Identify knowledge, motivational and organizational causes of gaps using research-based theories to support them.
17. Determine innovative knowledge, motivational and organizational solutions for closing the gap grounded in theoretical and practical research.
18. Develop an evaluation plan using Kirkpatrick's Four-Level Evaluation model for the proposed gap solutions.
19. Understand the connection between gap analysis and evaluative inquiry.
20. Value the applicability of systematic inquiry to examine complex problems of practice at learning organizations.
21. Communicate written professional opinions in a scholarly manner, as defined by APA guidelines.

This course aims to provide students with the understanding that inquiry as practice is a systemic and systematic problem-solving approach used to examine complex problems of professional practice through various lenses, with the aim of designing innovative solutions that will result in improvement. To this effect, it is essential that scholarly practitioners consider information in a systematic manner before designing and evaluating set solutions (CPED 2015c; Rueda, 2011). Even though educational literature offers numerous problem-solving models, this initial course has been designed around one that has its origins in the business world, which is highly suitable to the problem-solving approach needed in educational settings: gap-analysis (Rueda, 2011).

Clark and Estes (2008) defined gap analysis as an approach that can be used to improve performance and achieve organizational goals, as it provides a way to clarify organizational and individual outcomes, assess them, and identify existing gaps that can prevent the attainment of expected performance levels (Rueda, 2011). Under this premise, the gap analysis approach depends on and is closely related to the understanding of program theory. Program theory seeks to explicitly explain how the program causes the intended outcomes (Fitzpatrick et al., 2011), facilitating the study of complex problems of practice, their causes, and the design of innovative solutions that will result in improvement. Moreover, the gap analysis approach embodies and promotes the use of Inquiry as Practice, which is a process that requires scholarly practitioners to pose significant questions to address complex problems of practice, have the ability to analyze situations, and use literature and data critically and effectively to develop groundbreaking solutions (CPED, 2015c).

The learning outcomes for EDF 7457 (see Table 14) distinctly support the overall instructional objectives, as well as the aforesaid curriculum design frameworks, models, and

principles utilized during the design process. Correspondingly, Table 16 clearly illustrates how the learning outcomes support the Ed.D. in Curriculum and Instruction program objectives at the introductory, intermediate, and advanced expectation levels. Given that EDF 7457 is the introductory research continuum course and that it primarily focuses on providing students with an introduction to action research and the study of complex problems of practice through the identification of gaps and causal and solution analysis, it is not surprising that most learning outcomes are heavily supporting program objectives 1-3, which address these topics. The outcomes particularly support program objectives 2 and 3, which focus on examining complex problems of practice through different lenses and engages in systematic inquiry to analyze them. However, it is also evident from the curriculum alignment matrix that EDF 7457 is providing a solid introduction and foundation for designing innovative research-based solutions, evaluative inquiry, and the principles of improvement science and capacity building. Also, program objective 1 is further supported by core courses.

Additional matrix analysis also confirms that program objectives and learning outcomes are aligned to support a spiral curriculum so that topics are revisited and reconstructed iteratively throughout the program, requiring the deepening and mastering of the topics being studied before building new knowledge (Bruner, 1960). Evidence can be found not only on the left skewness pattern depicted by the classification of learning outcomes in the matrix but also by the classification system itself, showing outcomes aligned at the introductory, intermediate, and advanced expectation levels for program objectives 1 and 2, while supporting program objective 3 mostly at the intermediate level. Similarly, program objectives 4, 5, 6, and 7 are supported mostly at the basic and intermediate expectation levels, with the understanding that they will be

revisited during other research courses, core courses, or other research supporting courses such as the LoP and DiP.

Table 17 shows the course alignment matrix for EDF 7494, Identifying Complex Problems of Practice, the second course in the research continuum. This course has three overall instructional objectives as follows:

1. Understand conceptual, ethical, and methodological issues regarding complex problems of practice and research.

2. Synthesize published research, supporting their development as evaluative inquirers.

3. Apply basic qualitative and quantitative data analysis methods and critically assess their usefulness and appropriateness to study issues in education.

Table 17: Course Alignment Matrix for EDF 7494

	P.O #1	P.O #2	P.O #3	P.O #4	P.O. #5	P.O. #6	P.O. #7
L.O. 1			A				
L.O. 2			A				
L.O. 3			A				
L.O. 4			B		B	B	
L.O. 5		I	I	I	I		I
L.O. 6	A	A					I
L.O. 7			I		B	B	
L.O. 8			A	I			
L.O. 9	A	A	I	I	I	I	I
L.O. 10		A		A	I	I	
L.O. 11	A	A		I			
L.O. 12	A	A	A	A			
L.O. 13			A		I	I	I
L.O. 14		A	A				I
L.O. 15					B	B	
B = basic, **I =** intermediate, **A =** advanced expectation for outcome							

Adapted from Allen (2004)

Note. Only P.O. addressed by the research continuum courses are included. P.O. = Program Objectives (refer to Table 11) and L.O. = Learning Outcomes, as follows:
1. Demonstrate integrity in data collection and analysis, avoiding fabrication, falsification, omission, or manipulation.*
2. Understand and apply ethical principles for research with human participants. *
3. Demonstrate personal integrity in academic settings, avoiding conflicts of interests (both personal and financial), integrity during examinations, and using respectful and professional interpersonal behavior. *
4. *RCR/Ethics designated objective
5. Understand and apply basic principles of testing, measurement, interviewing, and surveying.
6. Use data to identify and understand problems of practice.
7. Identify problems in professional practice that require additional study.
8. Understand and apply basic descriptive statistics.
9. Use education technology applications and productivity tools to process, display and analyze data and document academic growth.
10. Identify, understand, and critique published research to formulate sound inferences grounded on data and the literature that support professional practice.
11. Construct a review of literature focused on a complex problem of practice.
12. Appropriately attribute authorship (avoiding plagiarism and self-plagiarism) and authorship credit.
13. Communicate professional opinions in a scholarly manner, as outlined by APA guidelines.
14. Value the applicability of mixed methods to evaluate a complex problem of practice and change.
15. Use inquiry as practice to carry out a gap analysis of a case study at a learning organization.
16. Understand how the use of evaluative inquiry leads to effect continuous improvement.

Accordingly, this second course aims to provide students with the understanding that

complex problems of practice are better identified, understood, and solved through the use of

mixed methodology approaches. Although this second course is also designed around the gap analysis approach (Clark & Estes, 2008), it requires students to study a complex problem of practice with emphasis on organizational causes as framed by Bolman and Deal (2009). Given the applied nature of the Ed.D. in Curriculum and Instruction program, this course and all research continuum courses were developed taking into consideration data-oriented approaches using real-world data to not only engage students but to support the acquisition of statistical literacy and reasoning skills, while differentiating them from traditional research courses (CPED, 2015c; Leech & Haug, 2015; Shaughnessy, 2003). Thus, EDF 7494 was designed as a mixed-methods course, better supporting the development of the scholarly practitioner, given that at the "center of Inquiry as Practice is the ability to use data to understand the effects of innovation" (CPED, 2015c, para. 4), and that it better supports the study of complex problems of practice (Bengston et al., 2014). In addition, the course exposes students to more sophisticated analysis and uses of educational literatures and continues to bridge the gap analysis with evaluative inquiry and improvement for capacity building. Last, this course ensures that students are aware of the ethical principles and personal integrity required of researchers and, thus, includes UCF mandated research and ethics objectives.

Table 17 clearly demonstrates how the learning outcomes for EDF 7494 (see Table 14) noticeably support the overall instructional objectives, as well as the aforementioned curriculum design frameworks, models, and principles used during the learning outcomes and course design process. Since this is the second course in the research sequence, it is not unexpected to find that program objectives 1 and 2, which were introduced in EDF 7457, are supported mainly at the advanced expectation level.

Program objective 3, which emphasizes the use of systematic inquiry to analyze complex problem of practice, is heavily supported by the learning outcomes, due to the course's focus on applied mixed-methods data analysis. Furthermore, the left skewness distribution of supporting outcomes shown for the first course has now shifted towards a more central distribution, supporting again the choice of spiral curriculum model design and allowing for mastery of topics before advancing to the next level of complexity (Bruner, 1960). Unlike EDF 7457, EDF 7494 supports program objectives 4, 5, 6, and 7 more predominantly, as students master the gap analysis process, and this course delves more deeply into the concepts and applications of evaluative inquiry for improvement at the organization. In the same manner, it requires the development of a more sophisticated literature review to inform both the problem of practice being studied and the design of research-based innovative solutions. Moreover, carrying the gap analysis case study and propose solutions to complex problems of practice creates opportunities for students to act as agents of change who positively impact the organization.

Table 18 displays the course alignment matrix for EDF 7478, Analysis of Data for Problems of Practice, the third course in the research continuum. The course has three instructional objectives as follows:

1. Understand the connection between program theory and improvement science.
2. Use qualitative and applied quantitative analysis to establish the need for organizational change and to determine the effectiveness of the implemented change(s) that results in the desired improvement.
3. Create, develop, and implement an improvement initiative to address a complex problem of practice at an educational organization.

Table 18: Course Alignment Matrix for EDF 7478

	P.O #1	P.O #2	P.O #3	P.O #4	P.O. #5	P.O. #6	P.O. #7
L.O. 1					B		
L.O. 2		I			I	I	I
L.O. 3		I	I	I	A	B	
L.O. 4	I	A	A	A	A	I	A
L.O. 5		A		A	A		
L.O. 6			A	I	A	I	A
L.O. 7			A	A	A	I	A
L.O. 8			A	A	A		
L.O. 9			A		A	A	
L.O. 10	A				A	A	A
B = basic, **I** = intermediate, **A** = advanced expectation for outcome							

Adapted from Allen (2004)

Note. Only P.O. addressed by the research continuum courses are included. P.O. = Program Objectives (refer to Table 11) and L.O. = Learning Outcomes, as follows:
1. Define "change" and "improvement" in the context of improvement science.
2. Create a Logic Model for the program/unit being evaluated.
3. Articulate how the framework for the Model for Improvement can be used to turn ideas into action and learning.
4. Use the PSDA (Plan- Study-Act-Do) cycle to build profound knowledge and test/implement a change that can be applied to practice for improvement.
5. Apply literature review principles (appropriateness, timeliness, scholarliness) to support the "planning stage" in an improvement initiative.
6. Apply suitable qualitative research methods to collect, analyze, and present data that will inform the improvement decision process.
7. Apply suitable applied quantitative research methods to collect, analyze, and present data that will inform the improvement decision process.
8. Use education technology applications and productivity tools record, document, analyze and disseminate findings.
9. Understand the connection between improvement science and evaluative inquiry.
10. Value the applicability of improvement science to address complex problems of practice at learning organizations.

The aim of this course is to ensure that students understand that effective learning organizations must engage in continuous improvement in order to effect positive change and growth, and enhance teaching and learning practices to increase performance and achieve organizational goals. Engaging in disciplined inquiry to foster a culture of continuous improvement and build capacity throughout the organization requires the application of

advanced evaluative inquiry skills (Carnegie Foundation, 2015; Langley et al., 2009). Thus, this course was framed around the principles of improvement science to accelerate the acquisition of a "system of profound knowledge" (Deming, as cited in Langley et al., 2009) needed to make changes that will result in improvement (Langley et al., 2009), and to further promote the development of evaluative inquiry skills in advanced professional practitioners.

The principles of improvement also fall within the realm of Inquiry as Practice, as it likewise promotes scholarly practitioners' posing significant questions about complex problems of practice and using data to understand change or the effect of innovation (CPED, 2015c). Besides, focusing the course around models for improvement further supports the constructivist approach described by Savery and Duffy (1996), reflecting the actual complexity of the work environment. This focus is also congruent with the core tenets of the spiral curriculum model, as it builds from previously introduced improvement science principles and the gap analysis problem-solving approach, with increasing levels of difficulty as student competence in evaluative inquiry increases (Harden & Stamper, 1999).

At this stage, students should have mastered program objectives 1 and 2; know how to identify and understand issues of learning, motivation, and organizational theory; and know how to name, frame, and critically examine complex problems of practice through multiple perspectives. As they advance through the continuum, students are now are ready to master engaging in systematic inquiry to analyze problems of practice through the application of mixed methods (program objective 3), refine the development of innovative solutions, apply the principles of improvement science to build capacity, and evaluate those solutions using research-based approaches (program objectives 4, 5, 6, and 7).

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Table 18 indeed validates how the EDF 7478 learning outcomes (see Table 14) markedly support the overall instructional objectives and the aforementioned curriculum design frameworks, models, and principles utilized during the outcomes and course design process. Further evidence can be found on the corresponding curriculum matrix (see Table 18), which reveals a slight right skewness pattern in support of the aforementioned design choices. This skewness is also due to the fact that learning outcomes for EDF 7478 heavily support program objectives 5 and 6 as they specifically relate to the application of improvement science principles and the use of evaluative inquiry to build capacity. The majority of learning outcomes support program objectives at the advanced expectation level, which is consistent with the spiral curriculum model employed. Few learning outcomes support program objectives at the intermediate level and only two at the basic expectation level. Program objectives 1 and 2 are also further supported at the advanced expectation level.

Last, Table 19 displays the course alignment matrix for EDF 7468, Evaluation of Complex Problems of Practice, the last course of the research continuum. The course also has three overall instructional objectives as follows:

1. Understand the basic principles, approaches, methodologies, data analysis, and dissemination of findings in program evaluation design.

2. Synthesize published research and other readings to support understanding of the discipline and profession of evaluation.

3. Design an evaluation plan to determine the success of a program at an organization using the most appropriate evaluation methodologies.

Table 19: Course Alignment Matrix for EDF 7468

	P.O #1	P.O #2	P.O #3	P.O #4	P.O. #5	P.O. #6	P.O. #7
L.O. 1						B	
L.O. 2					I	B	
L.O. 3					I	I	
L.O. 4					I	I	
L.O. 5	A	A		I		A	A
L.O. 6					A	A	
L.O. 7		A	A	A	A	A	
L.O. 8	A	A		I	A	A	
L.O. 9	A				A	A	
L.O. 10		A	I		A	A	A
L.O. 11			I			A	
L.O. 12					A	A	
L.O. 13			A			A	A
L.O. 14						I	
L.O. 15		A			A	A	
L.O. 16				A	A	A	A
B = basic**, I =** intermediate**, A =** advanced expectation for outcomes							

Adapted from Allen (2004)

Note. Only P.O. addressed by the research continuum courses are included. P.O. = Program Objectives (refer to Table 11) and L.O. = Learning Outcomes, as follows:
1. Understand the history, influences, and evolution of evaluation across disciplines.
2. Understand classic, current, and new directions for research on evaluation.
3. Differentiate between formative and summative evaluations.
4. Differentiate between internal and external evaluation/evaluators.
5. Apply evaluation standards to identify political, social, ethical, and methodological problems in professional practice necessitating further investigation.
6. Examine and critique the conceptual distinctions between contemporary theories of evaluation practice.
7. Identify and critique published evaluation studies and formulate sound inferences grounded on data.
8. Apply advanced research skills to acquire peer-reviewed publications to support professional practice.
9. Identify and describe a complex problem of practice to be evaluated.
10. Plan a formative/summative evaluation utilizing principles of program theory, improvement science, and effective evaluation practices.
11. Use education technology software applications and productivity tools to process, display, and analyze data, and document academic growth.
12. Demonstrate understanding of sound research methodology, evaluation, and dissemination of findings.
13. Identify what quantitative and qualitative data must be collected to address evaluation questions.
14. Report evaluation results to maximize use and understanding.
15. Communicate professional positions in a scholarly manner in both written (APA Publication Manual) and oral modalities.
16. Value the applicability of evaluative inquiry to build capacity and effect program improvement.

The overall aim of the course is to ensure students understand that program evaluation is a necessary and vital step of improvement in an educational system, as well as a responsibility for anyone overseeing a program. Similarly, the main purpose of program evaluation is to provide the basis for making effective data-driven decisions and recommendations about the success of the program through the use of mixed methods, which increase the validity of an evaluation as they promote data triangulation and evaluation through multiple lenses.

Since scholarly practitioners should practice the use of inquiry and act as agents of change at their learning organizations (CPED, 2015c; UCF, 2015), research preparation courses must focus on implementing effective changes that result in improvement (Langley et al., 2009). It is imperative to use evaluative inquiry to collect relevant information to identify, clarify, and apply defensible criteria to determine the merit or worth of a change and make recommendations to optimize it (Fitzpatrick et al., 2011). In other words, it is vital to determine whether an implemented change indeed results in the desired or expected improvement or improves the value of an organization's product (Langley et al., 2009), which for educational settings is measured as student success. Therefore, the use and application of program evaluation concepts, techniques, and findings are central to fostering improvement and the development of organizational leaders who have self-determination (Fitzpatrick et al., 2011).

Subsequently, this course was designed to empower individuals and organizations to make data-driven formative decisions and develop internal mechanisms for ongoing self-monitoring through evaluation capacity building with the aim of improving school performance (Fitzpatrick et al., 2011; Rueda, 2011). Evaluation of Complex Problems of Practice is also consistent with the core tenets of constructivism and spiral curriculum development. Building from improvement science and evaluative inquiry concepts and skills learned, it seeks to

continue increasing student competency by allowing them to build more complex ideas as they delve into the use of evaluative inquiry (Brown et al., 1989, Harden & Stamper, 1999). During this final stage, students have mastered and will continue to show proficiency in program objectives 1, 2, and 3 and will complete the loop by acquiring the necessary skills and proficiency as they delve into program evaluation and fully master program objectives 4, 5, 6, and 7.

Table 19 clearly depicts how the EDF 7468 learning outcomes (see Table 14) support the overall instructional objectives and the previously mentioned curriculum design frameworks and principles used during the outcomes and course design process. The curriculum matrix presents a marked right skewness pattern, as anticipated due to the heavy focus of the course on program objective 6. Along the same lines, EDF 7468 also discernably supports program objective 5, as it expands from previously learned principles of improvement science and evaluation to build organizational capacity. The majority of these culminating learning outcomes support program objectives at the advanced expectation level, which is consistent with Bruner's (1960) spiral curriculum model. Learning outcomes 1 and 2 are an exception, as these support program objective 6 only at the basic level, given that these concepts are only learned at an introductory stage. Even though the course's learning outcomes mostly support program objectives 5 and 6, the matrix also reveals that the course supports program objectives 1, 2, 3, 4, and 7 mostly at the advanced expectation level consistent with a summative continuum course. Also, every program objective is supported at the intermediate level, again consistent with the culminating nature of the course, requiring students to demonstrate mastery through the integration and application of all previously attained inquiry continuum learning outcomes and applied research skills.

Summary

The curriculum alignment matrices, created to identify where individual research course learning outcomes supported the overall Ed.D. in Curriculum and Instruction program objectives and expected outcomes identified in the program's logic model, provide sufficient and well-defined evidence of the existing alignment throughout the research continuum. All program objectives are supported at the basic, intermediate, and advanced level expectation, allowing students to gradually construct, acquire, and master new knowledge as research courses increase in level of complexity throughout the program in agreement with a spiral curriculum model (Brown et al., 1989; Bruner, 1960; Harden & Stamper, 1999). This result is also in agreement with best teaching and learning practices, which support the idea that students will perform best when they are introduced to learning outcomes early in the continuum and then given enough opportunities to practice and master them (University of Hawaii-Manoa, 2013).

The patterns identified throughout the continuum also illustrate the existence of a spiral curriculum model, where the acquisition of inquiry as practice skills takes place through authentic and active learning experiences in context, which are integral to cognition and learning of applied quantitative and qualitative methodologies (Brown et al., 1989; Shaughnessy, 2003). The developed learning outcomes ensured that any gaps previously identified in Table 12 were addressed, and they demonstrated that they strongly support each program objective, showing no identifiable gaps within the research course sequence. Appendix G provides a visual representation of the connections between the Ed.D. in Curriculum and Instruction program objectives and the research continuum course learning outcomes.

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CHAPTER FOUR: CURRICULUM DESIGN PROCESS

Introduction

In order to further identify the learning opportunities that produce the Professional

Doctorate in Education program objectives, and to ensure that any identified gaps and

redundancies in Table 12 were eliminated, I developed course curriculum maps for each research

continuum course using UbD templates (adapted from Wiggins & McTighe, 2005). UbD is a

framework that uses the backward design principle, or beginning with the end in mind, to guide

curriculum, instruction, and assessment in a three-stage process: identifying desired results,

determining acceptable evidence, and planning learning experiences and instruction (Wiggins &

McTighe, 2005). Accordingly, the individual research continuum curriculum maps were created

using backward design with the intentionality and purpose of carefully beginning with the Ed.D.

in Curriculum and Instruction goal and corresponding program objectives to ensure that

scholarly practitioners achieve the desired learning outcomes (Wiggins & McTighe, 2005). The

entire backward redesign process was informed by the previously described end-user personas

and the principles of consistency, constraint, control, and flexibility, allowing for the

customization of the designed curriculum to the changing needs and readiness levels of both

faculty and advanced professional practitioners (Lidwell et al., 2010).

Course redesign was also guided by the previously explained CPED (2015c, 2015d)

Working Principles and Design Concepts, especially the use of Inquiry as Practice, improvement

science principles (CFAT, 2015; Langley et al., 2010), Bruner's (1960) spiral curriculum model,

and the Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006). TPACK is a framework that highlights the connections between technology, curriculum content, specific pedagogical approaches, and context, thus identifying the knowledge that instructors must have to ensure the application of appropriate technologies to the content and differentiated pedagogical strategies used to address individual learners' needs (Mishra & Koehler, 2006).

All research courses deliberately contain one education technology or productivity-based learning outcome, to ensure that technology is used in a manner that enhances the learning experience while also helping students acquire the necessary skills and pedagogical insights needed to be successful educators in the digital age (ISTE, 2016). In addition, all course assessment evidence sections include a reflection component for students' e-portfolios, thus using technology to document their professional and academic growth throughout the continuum. Likewise, the whole redesign process was informed by the collected curriculum information data (Appendix F) and through collaborative meetings and personal communications with Ed.D. in Curriculum and Instruction faculty members.

The first stage in the process required the identification of enduring understandings, essential questions, and the knowledge and skills that students will acquire as a result of each course based on the established Ed.D. in Curriculum and Instruction goal and objectives (Wiggins & McTighe, 2005). During this stage, some of the existing learning outcomes were left intact, while others were either combined or newly developed using Anderson and Krathwohl's (2001) revised taxonomy to ensure alignment with the chosen design frameworks, models, and principles as well as with the program goal and objectives.

For the second step, assessment evidence for each desired result was considered. Existing, redesigned, and newly developed course assessment methods match the format of the assessment with the corresponding evidence of achieving a desired result (Wiggins & McTighe, 2005). This matching was accomplished by using Wiggins and McTighe's (2005) prioritizing framework for contents and assessment methods: big ideas are assessed in all research continuum courses through authentic performance tasks, which provide relevant and contextualized learning experiences to enable students to study complex problems of professional practice and develop innovative solutions. Important ideas and those which students should be familiar with are assessed through traditional tests, constructed response assignments, reflections, and presentations. Courses were designed in alignment with the authentic performance tasks, embedding learning in the activities to allow for sufficient informal and formal formative feedback as students construct new knowledge and master enabling objectives before carrying out summative tasks, as the level of complexity increases throughout the continuum (Brown et al., 1989; Bruner, 1960; Shaughnessy, 2003).

Through the use of a spiral curriculum model (Bruner, 1960) research courses seek to progressively introduce professional educators to the study and use of inquiry for improvement, the application of mixed methods to analyze a complex problem of practice, and the introduction of evaluative inquiry and design-based research in preparation for students' capstone experience to effect change and improvement in educational settings. The third step consisted of planning the learning experiences and instruction, as well as the selection of resources for the course (Wiggins & McTighe, 2005).

An overview of the main topics for each semester week was provided, allowing instructors to further develop and adapt the outline to match their instructional preferences and

approaches. A complete prototype quantitative unit for EDF 7478, Analysis of Data for Complex Problems of Practice, can be found in Appendix E. In addition, I developed a model technology-rich lesson for the quantitative unit and overall summative assessment for EDF 7478 and sample formative assessments for EDF 7468, Evaluation of Complex Problems of Practice.

The research course continuum courses were redesigned in alignment with the clarified Ed.D. in Curriculum and Instruction program goal, which states that the scholarly practitioner must be able to critically examine complex problems of educational practice in context from multiple perspectives with the goal of effecting change, as well as with the redefined program objectives. In order to accomplish this, scholarly practitioners must use Inquiry as Practice to develop the habit of posing significant questions about complex problems of practice in context, to develop innovative solutions grounded in theoretical and practical research, with the aim of effecting change that will result in improvement (CFAT, 2015; CPED, 2015c; Langley et al., 2009; Rueda, 2011). Consequently, the previously identified CPED (2015d) Working Principles 4 and 5 provided the framework for the redesign, while the concept of Inquiry as Practice provided the main architecture for building the four research continuum courses (CPED, 2015c). The use of Inquiry as Practice as the signature pedagogy of the program was selected as a design choice, as it prepares advanced education practitioners to be successful in all aspects of their professional work (CPED, 2015c).

Since the Ed.D. in Curriculum and Instruction program is designed for scholarly practitioners, it was essential to maintain the roles of applied research and practical theory at the core of the redesign process (Perry, 2015; Shulman et al., 2006). Accordingly, it was evident that the practical nature of the research courses required a different type of inquiry, one that could be used and applied directly in the field (Bengston et al., 2014). Therefore, the principles of

Improvement Science (Langley et al., 2009) were also used to restructure and innovate the research courses, not only providing a focus on continuous improvement in educational settings but also reflecting the hallmarks of the scholarly practitioner's role: being an agent of change who has a positive effect in the organization and community. Furthermore, the personas developed were used to ensure the tailoring of research courses to the specific needs of advanced professional practitioners with varying degrees of research expertise and backgrounds and to provide the necessary consistency, control, and flexibility for research and program faculty members to adapt the curriculum to meet these student needs, skills, and interests while maintaining the applied inquiry focus of the courses. As such, each research course UbD curriculum unit was redesigned to permit the tailoring of contents to the changing needs of program cohorts throughout the years, through the use of frameworks for differentiation and personalization such as the Universal Design for Learning (UdL), and to allow the prioritization of enabling objectives (Pratt, 1994) that will enable students to master the corresponding learning outcomes.

In essence, the research continuum courses were redesigned using the aforesaid design choices to progressively introduce Inquiry as Practice for continuous improvement as the systemic, systematic, and disciplined problem-solving framework for studying complex problems of practice through the use of quantitative and qualitative methods and the principles of evaluative inquiry and improvement science to ensure that implemented changes actually result in the desired improvements (CPED, 2015d; Langley et al., 2009). The design choices I selected followed and established a sequential/integrated model, where the research coursework is completed consecutively and is complemented by the core courses, thus supporting the training of students by providing examples of design-based and evaluation studies in preparation for their

roles as scholarly practitioners at their organizations and during the program's culminating

capstone project (Manathunga et al., 2004). The design of curriculum that integrates research and

coursework is key to the formation of scholarly practitioners who can make a substantial

contribution to the knowledge of professional practice through applied research (Manathunga et

al., 2004).

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Goal 3: Individual Research Course Curriculum Maps

EDF 7457: Data, Assessment, and Accountability

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Given that it is necessary for scholarly practitioners to consider information about a

complex problem of practice in a systemic and systematic manner before designing and

evaluating innovative solutions (CPED, 2015c; Rueda, 2011), I elected to redesign this initial

research course framed around the culminating performance task: the gap analysis project. My

design choices are further rooted in course data obtained from the informational meetings held

with Dr. Hopp, current course instructor, and her course materials from Webcourses. The design

choices were additionally inspired by ongoing discussions with Dr. Boote about the need to

purposefully include improvement science principles in the research continuum and carry out the

gap analysis project in this course, instead of in the first core course of the program.

Since EDF 7457 is now the first course in the research continuum, it was redesigned to

introduce students to the role of inquiry in professional practice, so that they learn how to use it

in a systemic, systematic, and disciplined manner (CPED, 2015d; Langley et al., 2009), and to

examine complex problems of practice from different perspectives. Additionally, they learn to

use the principles of improvement science, fostering data-based decision-making for continuous

improvement and effecting positive change. As previously mentioned, the course curriculum was

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developed using the authentic performance task as a backbone, which entails carrying out a gap

analysis case study to learn more about the possible causes of a chosen complex problem of

practice in order to propose suitable solutions and an evaluation plan. Tables 20, 21, and 22 show

the UbD curriculum map for EDF 7457.

Table 20: UbD Curriculum Map for EDF 7457 Data, Assessment, and Accountability—Stage 1

Stage 1 – Desired Results

Established Goals (G):

Ed.D. Program Goal: The Ed.D. in Curriculum and Instruction program will prepare scholarly practitioners to critically examine complex problems of educational practice in context through the use of inquiry as practice with the aim of designing innovative solutions that will effect positive change.

Ed.D. Program Objectives:
1. Identify and understand issues of learning, development, motivation, and organizational theory.
2. Name, frame, and critically examine complex problems of educational practice through multiple perspectives.
3. Engage in systematic inquiry to analyze complex problems of educational practice.
4. Design, develop, and implement innovative solutions to complex problems of practice.

Overall Instructional Objectives:
  ➢ *Students will be able to independently use their learning to:*
   ○ Understand and apply the principles of Inquiry as Practice and program theory to identify and study complex problems of professional practice to effect change and improvement.
   ○ Apply gap analysis principles to develop and present a case study to address a complex problem of practice at an educational organization.
   ○ Relate the gap analysis approach to design-based research and evaluative inquiry.

Understandings: (U)	Essential Questions: (Q)
Students will understand that… (big idea) ● Inquiry as Practice as a systemic and systematic inquiry is a problem-solving approach used to examine problems of professional practice through various lenses, with the aim of designing innovative solutions that will result in improvement.	● How can systematic inquiry be used to design innovative solutions for complex problems of practice? ● How does gap analysis improve performance and achieve organizational goals? ● What role does program theory play in organizational change? ● How can we know if a proposed solution results in reducing an existing "gap" at a learning organization? ● How do qualitative and quantitative data help frame and solve a complex problem of practice? ● What is the connection between the gap analysis approach and evaluative inquiry?

Stage 1 – Desired Results	
Students will know… (**K**)	*Students can…* (S)
1. Introduction to Inquiry for Practitioners - Types of Research Design - Inquiry for Continuous Improvement/Improvement Science - Traditional vs. Action Research and DiP - Practitioner-based focus 2. Complex Problems of Professional Practice - Problems in Context - Positionality - Gap Analysis Problem-Solving Approach Summative Assessment (backbone for whole course) 3. Literature Review - Annotated Bibliography - Problem/Program Description 4. Introduction to Program Theory and Logic Models - Logic Model for Gap: short-term, intermediate, and long-term goals to determine gaps 5. Introduction to Mixed Methods - Using Quantitative Data to Support Gap/Make Data-Driven Decisions - Qualitative methods 6. Causal Analysis 7. Introduction to Design-Based Research - Solution Design (gap) 8. Introduction to Evaluative Inquiry - Kirkpatrick Model of Evaluation *Note. Objectives were numbered to show alignment with the identified knowledge/topics to be covered in the*	1.1 Define systematic inquiry. 1.2 Differentiate between the main types of research designs. 1.3 Distinguish traditional research from action research. 2.1 Engage in the study of problems of practice. 2.2 Examine individual work contexts and actions required. 2.3 Understand and describe positionality and its complexity. 2.4 Situate the problem of practice within the context of the organization. 3.1 Create an annotated bibliography to inform a problem of practice. 3.2 Use the annotated bibliography to develop a detailed description of the program and its significance. 4.1 Create a Logic Model for the program/unit being evaluated. 4.2 Define short-term, intermediate, and individual performance measurable goals to determine the existing gaps. 5.1 Differentiate between quantitative and qualitative methods. 5.2 Demonstrate proficiency in following qualitative research protocols 5.3 Use quantitative/qualitative data to support the existing gap. 5.4 Use education technology applications and productivity tools to process, display, and analyze data and document academic growth. 6.1 Identify knowledge, motivational and organizational causes of gaps using research-based theories to support them. 7.1 Determine innovative knowledge, motivational and organizational solutions for closing the gap grounded in theoretical and practical research. 8.1 Develop an evaluation plan using Kirkpatrick's Four-Level Evaluation model for the proposed gap solutions.

Stage 1 – Desired Results	
course, as well as with all assessments.	● 8.2 Understand the connection between gap analysis and evaluative inquiry. ● 8.3 Value the applicability of systematic inquiry to examine complex problems of practice at learning organizations. ● 9.1 Communicate written professional opinions in a scholarly manner, as defined by APA guidelines.

Table 21: UbD Curriculum Map for EDF 7457 Data, Assessment, and Accountability—Stage 2

Stage 2 – Assessment Evidence	

Performance Tasks: (T)
 	
• *Authentic (Summative) Assessment (ALL L.O.)*: The individual culminating performance task (Gap Analysis Project) will serve as the "backbone" for the whole course. The instructor will look for demonstration of conceptual, procedural, and metacognitive knowledge aligned with the corresponding objectives.
 	
o This culminating performance task will be scaffolded to assess all course units. The final product will be a paper for the instructor, and an poster presentation (this could be invited as a special event). A technology/productivity component will be incorporated within the gap analysis project and the journal reflections.
 	
*Note: the authentic assessment will also model and ensure the use of inquiry as practice as the signature pedagogy (experiential objective), and an introduction to program evaluation and sharing of results as a bridge for the following research course.
 	
Evaluative Criteria
 	
● Introduction to Research 5%
● Problem of Practice and Context 5%
● Positionality 5%
● Project Advances 15%
● Annotated Bibliography 10%
● Qualitative Methods 10%
● Gap Analysis/Poster Presentation 30%
● Journal Reflection 10%
● Participation/Discussions 10%
	Other Evidence: (OE)
	• *Formative Assessments:*
	
	§ *Informal*
	o Class observations and dialogues (1.1-9.1).
	
	§ *Formal*
	o Introduction to Research Quiz (1.1-1.3)
	o Problem of Practice and Context (2.1-2.2, 2.4, 9.1)
	
	    ● Problem definition
	    ● Fishbone diagram (cause effect)
	    ● Context description (purpose, demographics, stakeholders).
	o Positionality (2.3, 9.1)
	    ● After reading the various types of positionality, refer to a specific problem of practice that you might research, determine your positionality, and explain why.
	o Annotated Bibliography (3.1)
	
	o Qualitative Methods (5.2)
	
	    ● Observe an event in your organization, take field notes, and write a detailed description of what happens.
	o Project advances (2.1-2.4, 3.2, 4.1-8.2, 9.1)
	    ● Problem of Practice/Positionality/Context
	    ● Program Description
	    ● Logic Model
	    ● Short, Intermediate and Performance Goals
	    ● Quantitative/Qualitative Data
	    ● Causal Analysis/Solutions
	• *Summative Assessments*
	
	o *Authentic Assessment:* Gap Analysis Final Project and Poster Presentation (1.1-8.3, 9.1)
	
	o Journal Reflection for e-portfolio (8.3, 9.1).
	
	• *Other*

Stage 2 – Assessment Evidence
o Participation/Discussions (1.1-9.1)

Table 22: UbD Curriculum Map for EDF 7457 Data, Assessment, and Accountability—Stage 3

Stage 3 – Learning Plan

Learning Activities: (L)

Week 1 - Introduction to Systematic Inquiry and Research Design Types
Week 2 - Problem of Practice/Context/Positionality
Week 3 - Gap Analysis Approach
Week 4 - Literature Review
Week 5 - Introduction to Program Theory and Logic Model
Week 6-10 - Mixed Methods for Data Analysis
Week 11- Causal Analysis
Week 12 - Introduction to Design-Based Research: Solution Analysis
Week 13 - Introduction to Evaluative Inquiry/Kirkpatrick
Week 14 - In-Class Project Work/Consultation
Week 15- Final Projects/Self-Reflection/Presentations

Suggested Resources

Textbooks

Creswell, J. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage.

Gherardi, S. (2012). *How to conduct a practice-based study: Problems and methods.* Cheltenham, UK: Edward Elgar.

Herr, K., & Anderson, G. (2015). *The action research dissertation: A guide for students and faculty*. (2nd ed.). Los Angeles, CA: Sage.

McMillon, J. (2012). *Educational research: Fundamentals for the consumer*. Boston, MA: Pearson.

Stringer, E.T. (2014). *Action research* (4th ed.). Thousand Oaks, CA: Sage.

Rueda, R. (2011). *The 3 dimensions of improving student performance*. New York, NY: Teachers College Press.

Websites
http://www.apa.org America Psychological Association
www.owl.english.purdue.edu/owl/section/2/10/ APA Guidelines

Adapted from Wiggins & McTighe (2005)

The existing course curriculum components were used as a foundation during the curricular redesign process. These components had already been designed to help graduate students understand the type of research that practitioners carry out and introduce them to the study of complex problems of practice. Thus, it was logical to build from this existing framework and incorporate all other gap analysis requirements. The course was restructured into eight modules to help students understand that Inquiry as Practice is a problem-solving approach that advanced professional practitioners use to examine complex problems of practice through different lenses with the aim of designing innovative solutions that will result in positive change (CPED, 2015c).

The first module seeks to introduce students to the unique role that inquiry plays in applied research or action research (Bengston et al., 2014). Action research can be defined as "inquiry done with or by insiders in an organization or community, but never to or on them" (Herr & Anderson, 2015, p. 3). Students will also review the types of research design, differentiate between traditional and action research, familiarize themselves with the aim of the DiP through the understanding that the study of complex problems of practice and models for improvement are done to achieve improvement in educational settings (CPED, 2015d; Langley et al., 2009; Rueda, 2011). This module also provides a clear overview of the applied nature or practitioner-based focus of research courses and how it differs from traditional research courses in other programs.

Once students have an understanding of the role of inquiry and the research continuum courses, they will engage in the study of complex problems of practice during the second module. This module retained the original course curriculum information, requiring students to view complex problems in context and understand their positionality, or who they are in relation

to their participants in their setting (Herr & Anderson, 2015). However, I added the introduction to the gap analysis approach and summative assessment description, so that it would be aligned with the rest of the curriculum. The first step in the gap analysis study is to describe the program and the problem, and as such every module was designed to aid students in developing each section of the gap analysis process. Likewise, during this module students learn how to identify a problem of practice and how to describe it with respect to its context and the researcher's positionality. In order to accomplish this, module 3, based on the existing curriculum, provides students with the necessary tools to carry out an initial doctoral level literature review and annotated bibliography that will further describe the problem being studied and also inform the causal and solution analyses section of the performance task.

Since the next step in the gap analysis study is to identify short-term, intermediate, and long-term goals to determine existing gaps, I designed module four to align with the introduction to program theory and the use of logic models, with the goal of using logic models to provide a visual representation of inputs, activities, outputs, and outcomes of a program (Fitzpatrick et al., 2011). In this manner, students would be able to clearly identify their goals for the gap analysis study and also learn how to position a problem within a larger organizational context. Moreover, it provides the foundational knowledge required to develop more detailed logic models in other continuum courses, as is characteristic of Bruner's (1960) spiral curriculum model.

Module five introduces students to the use of mixed methods to analyze complex problems of practice. The gap analysis study requires the use or creation of existing data to support and document the identified gap; hence, module 5 was designed to help students with the data analysis portion of the study. During the design, I used existing course components for qualitative methods and expanded the module to include quantitative methods as well, with the

aim of using quantitative data to support the existing gap and analyze assessment or other performance data effectively in order to make data-driven decisions to validate the solution analysis. In this introductory course, students are encouraged to use existing qualitative and/or quantitative performance data, collect informal data, or use their experience to extrapolate data that would support the existing gap, rather than carrying out a formal data collection protocol that requires Institutional Review Board (IRB) approval. The following course will allow students to build upon the knowledge and skills learned during this course to carry out a formal mixed methods data collection to support organizational gaps.

Module six was designed to introduce students to causal analysis and support the development of their own analyses for their gap analysis study. I designed this module to require students to apply skills and knowledge learned during module three and effectively use literature to support their choices, providing multiple opportunities for practice and mastery of the learning outcomes.

The gap analysis study asks students to identify and/or design possible solutions for their problems. Therefore, I designed module seven to help students learn about solution analysis, while also being introduced to the concept of design-based research and solution choices. This was purposefully done to ensure that students become familiar with the main types of research design that practitioners carry out, linking this learning to both the first module and providing the foundation for the following research sequence courses.

Finally, module eight introduces students to evaluative inquiry and the need to evaluate any solution or change made, to verify that it results in the desired improvement (Langley et al., 2009). Special focus is placed on Kirkpatrick's Model for Evaluation as required by the gap

analysis study, with the understanding that students will value the applicability of inquiry and evaluation to create a culture of continuous improvement in educational settings.

Course learning outcomes (see Table 14) were intentionally developed using open-ended statements to allow for the tailoring of curriculum to individual cohort needs. In this way, they facilitate the creation of enabling objectives that can be used to enrich or remediate student needs in different areas through the use of UdL principles and by prioritizing them into critical, important, and desirable objectives (Pratt, 1994). Table 20 shows how learning outcomes have been numbered to show alignment with each module and with the assessment evidence selected. Learning outcomes and assessments require students to demonstrate knowledge at different levels and cognitive processes in correspondence with high-order thinking (Anderson & Krathwohl, 2001).

Assessments were designed to incorporate both informal and formal formative assessments and summative assessments to provide multiple opportunities for mastery. The formative assignments are aligned with the aforementioned modules and seek to provide formative feedback for students as they develop their individual gap analysis study and master learning outcomes throughout each module, through project advances or individual assignments. This was purposefully done as this is the first course in the continuum, and it is necessary to account for the varied inquiry backgrounds of the students in a cohort.

As mentioned earlier, this unit overview was also designed using the principles of flexibility, control, and constraint (Lidwell et al., 2010). Assessments are flexible, as they are under the control of the instructor and can be modified or reduced as informed by the faculty and student personas and depending on the needs of students. The overview also provides constraint, as it clearly delineates the core ideas that must be included in this first inquiry course, ensuring

that regardless of the instructor's background, the course maintains its applied nature and fulfills the needs of advanced professional educators.

Likewise, summative assessments include the final gap analysis project, poster presentations, and the e-portfolio journal reflection. Having students present their study in an informal poster session prepares students for the program's second milestone and for professional presentations they may have to prepare in the future. Similarly, the idea of incorporating a summative reflective component for each course is founded on the need to instill metacognition and document the learning and professional growth that occur as a result of the program and to provide more opportunities for the acquisition of skills for the digital age. The e-portfolio can be created through a website to further the opportunities to incorporate technology into the curriculum, or it can be created in Webcourses at the faculty member's discretion.

The UbD unit also provides a suggested timeline for the modules throughout the semesters, along with resources that would be useful to both faculty and students. Many of these were already included in the existing course, with the exception of Rueda's (2011) book; the American Psychological Association (APA) manual (2009) and the Purdue Owl website (Paiz, 2016) for APA guidelines; and the Stringer (2014) book for action research. All resources were chosen for their existing reviews as the best to support the gap analysis approach and understanding of action research.

In conclusion, this initial course provides a solid foundation on the use and role of Inquiry as Practice in educational settings for advanced professional practitioners. It progressively introduces students to the systematic study of complex problems of practice through multiple frames through the gap analysis case study and the identification of innovative

solutions, and it bridges the applicability of evaluative inquiry to ensure continuous improvement in learning organizations in preparation for other research continuum courses.

EDF 7494: Identifying Complex Problems of Practice

The second course of the continuum is designed to build upon the foundational knowledge and skills introduced during the first course on the use of inquiry in educational professional practice, giving students the opportunity to further practice or master learning outcomes in support of the Ed.D. in Curriculum and Instruction program objectives and the overall goal. Tables 23, 24, and 25 depict the UbD curriculum unit for EDF 7494, Identifying Complex Problems of Practice.

Table 23: UbD Curriculum Map for EDF 7494 Data, Identifying Complex Problems of Practice—Stage 1

Stage 1 – Desired Results
Established Goals (G): **Ed.D. Program Goal:** The Ed.D. in Curriculum and Instruction program will prepare scholarly practitioners to critically examine complex problems of educational practice in context through the use of inquiry as practice with the aim of designing innovative solutions that will effect positive change. **Ed.D. Program Objectives:** 　**1.** Identify and understand issues of learning, development, motivation, and organizational theory. 　**2.** Name, frame, and critically examine complex problems of educational practice through multiple perspectives. 　**3.** Engage in systematic inquiry to analyze complex problems of educational practice. 　**4.** Design, develop, and implement innovative solutions to complex problems of practice. 　**7.** Create a positive impact on an organization, employer, or the community as an agent of change. **Overall Instructional Objectives:** 　➢ *Students will be able to independently use their learning to:* 　　○ Understand conceptual, ethical, and methodological issues regarding complex problems of practice and research.

Stage 1 – Desired Results	
○ Synthesize published research, supporting their development as evaluative inquirers. ○ Apply basic qualitative and quantitative data analysis methods, and critically assess their usefulness and appropriateness to study issues in education.	
Understandings: (U) *Students will understand that… (big idea)* ● Complex problems of practice in educational settings are better identified, understood, and solved through the use of mixed methodology approaches.	**Essential Questions: (Q)** ● How can we ensure participant safety in research studies involving human subjects? ● What role does literature play in research and evaluation? ● How can we use qualitative and quantitative methods to inform, solve, and evaluate a complex problem of practice?

Students will know… (K)
 ● 1. Research Ethics and CITI Training
   ○ Types of Research Design
   ○ Traditional vs. Action Research
     ■ Practitioner-based focus
 ● 2. Quantitative and Qualitative Methods
   ○ Qualitative Data
   ○ Quantitative Data
   ○ Best Practices
   ○ Designing Mixed Methods
     ■ Logic Model
     ■ Goals and Evaluation Questions
     ■ Data and Instruments
     ■ Gap Analysis Blueprint (IRB)
   ○ Introduction to Interviewing
     ■ Interviewing
     ■ Interviewing Guide
     ■ Improving Interview Questions
     ■ Interview Data Analysis
   ○ Introduction to Surveying
     ■ Survey Item Types and Levels of Measurement
	Students can: (S)
	 ● 1.1 Demonstrate integrity in data collection and analysis, avoiding fabrication, falsification, omission, or manipulation.*
	 ● 1.2 Understand and apply ethical principles for research with human participants. *
	 ● 1.3. Demonstrate personal integrity in academic settings, avoiding conflicts of interests (both personal and financial), integrity during examinations, and using respectful and professional interpersonal behavior. *
	 * RCR/Ethics designated objective
	 ● 2.1 Understand and apply basic principles of testing, measurement, interviewing, and surveying.
	 ● 2.2 Use data to identify and understand problems of practice.
	 ● 2.3. Identify problems in professional practice that require additional study.
	 ● 2.4 Understand and apply basic descriptive statistics.
	 ● 2.5 Use education technology applications and productivity tools to

Stage 1 – Desired Results	
■ Best Practices ● 3. Literature Review ○ Role of Literature in Research ○ Best Practices (appropriateness, scholarliness, timeliness) ○ Concept Mapping ○ Effective Reading and Summarizing ○ Gap Analysis Literature Review ● 4. Work Preferences ○ Inventory ● 5. Gap Analysis ○ Proposal and IRB Submission ○ Project Advances ● 6. Evaluative Inquiry and Continuous Improvement ○ Use of evaluative inquiry to ensure continuous improvement. Introduction of PDSA model (bridge to next course).	process, display, and analyze data and document academic growth. ● 3.1 Identify, understand, and critique published research to formulate sound inferences grounded on data and the literature that support professional practice. ● 3.2 Construct a review of literature focused on a complex problem of practice. ● 3.3 Appropriately attribute authorship (avoiding plagiarism and self-plagiarism) and authorship credit. ● 3.4 Communicate professional opinions in a scholarly manner, as outlined by APA guidelines. ● 4.1 Value the applicability of mixed methods to evaluate a complex problem of practice. ● 5.1 Use inquiry as practice to carry out a gap analysis of a case study at a learning organization. ● 6.1 Understand how evaluative inquiry leads to effecting of continuous improvement.

Table 24: UbD Curriculum Map for EDF 7494 Data, Identifying Complex Problems of Practice—Stage 2

Stage 2 – Assessment Evidence	
Performance Tasks: (T) • *Authentic (Summative) Assessment (ALL L.O.)*: The individual culminating performance task (Gap Analysis Project) will serve as the "backbone" for the whole course. The instructor will look for demonstration of conceptual, procedural, and metacognitive knowledge aligned with the corresponding objectives. o This culminating performance task will be scaffolded to assess all course units. The final product will be a paper for the instructor, and a reflection. A technology/productivity component will be incorporated as part of the data analysis section in the gap analysis project. *Note: the authentic assessment will also model and ensure the use of inquiry as practice as the signature pedagogy (experiential objective), and an introduction to program evaluation and sharing of results as a bridge for the following research course. Evaluative Criteria ● CITI & IRB Training 10% ● Evaluation proposal, submitted to IRB 30% ● Test 20% ● Gap analysis paper and Reflection 30% ● Participation 10%	Other Evidence: (OE) • *Formative Assessments:* § *Informal* o Class observations, discussions, and dialogues (1.1-4.1). § *Formal* o CITI Training (1.1-1.3) o Evaluation Proposal Submitted to IRB (1.1-2.4): purpose, evaluation questions, blueprint, interview protocols, surveys, invitations, consent forms, details of study procedures and methods, confidentiality, permission to conduct the study. o Blueprint, Goals, Questions Draft (1.1-2.4) o Literature Review Draft (3.1-3.4) ● Substantial research on complex problem of practice and solutions. • *Summative Assessments* o Test: Interview and Survey Methods (2.1). o Authentic Assessment: Gap Analysis Final Project and Reflection (1.1-6.1) • *Other* o Attendance/Participation/Discussions (1.1-4.1, 6.1)

Table 25: UbD Curriculum Map for EDF 7494 Data, Identifying Complex Problems of Practice—Stage 3

Stage 3 – Learning Plan
Learning Activities: (L) Week 1 - Research Ethics and CITI Training Week 2 -5 - Qualitative and Quantitative Data Week 6 - Literature Reviews Week 7 - Work Preferences Week 9 - Gap Analysis Proposal and IRB Submission Week 10 -14 - Gap Analysis Project/Reflections Week 15 - Introduction to Model for Improvement (bridge to next course) Suggested Resources *Textbooks* Harrison, M. I. (2005). *Diagnosing organizations: Methods, models and processes*. Thousand Oaks, CA: Sage. Rossman, G.B., & Rallis, S.F. (2003). *Learning in the field: An introduction to qualitative research* (2nd Ed.). Thousand Oaks, CA: Sage. Seidman, I. (2006). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (3rd ed.). New York, NY: Teachers College Press. Shank, G.D. (2002). *Qualitative research: A personal skills approach*. Upper Saddle River, NJ: Merrill Prentice Hall. *Articles* Boote, D. N., & Beily, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher*, *34*(6), 3-15. Byrk, A. S. (2015). Accelerating how we learn to improve. *Educational Researcher*, *44*, 467-477.

Adapted from Wiggins & McTighe (2005)

Congruent with the spiral curriculum model, the second course presents concepts at a higher complexity level than the first course, which is central to integrated and problem-based learning approaches used throughout the research continuum to study complex problems of

practice that are deemed worthy of concern to organization members (Bruner, 1960; Harden & Stamper, 1999). Consequently, the course comprises six modules in which students delve deeper into the understanding that complex problems of practice in educational settings are better understood and solved through the use of mixed methodological approaches.

The information that guided the redesign process for this course was obtained directly from the course instructor, Dr. Boote, via ongoing informational meetings, and from course materials available through Webcourses. EDF 7494 used to be considered the first course in the research continuum, and therefore already had a fully developed curriculum to address the role of inquiry, research ethics, and the role of quantitative and qualitative data in the study of complex problems of practice. As such, the majority of the course curriculum was used without modifications during the redesign process, except for module six, which provides continuity with research courses to follows, the incorporation of education technology or productivity objectives to support professional development of 21st-century teachers (ISTE, 2016), and an affective learning outcome measured in the proposed summative reflection assessment included.

This course was also originally designed to include the University mandated research ethics and the Collaborative Institutional Training Initiate (CITI) Program Responsible Conduct of Research (RCR) training. Hence, those learning outcomes and corresponding contents were also not modified, as it is a required component. However, the inclusion of these learning objectives in this second course is perfectly aligned with the expected increase in student competency as they address previously learned concepts in increasing levels of difficulty (Harden & Stamper, 1999). Consequently, the first module in the course addresses these learning outcomes, preparing students for the submission of their first IRB application.

The second module aims to further equip students with the necessary skills to apply mixed methods for advanced professional educators in the study of a complex problem of practice. Even though this second course was not fully redesigned around the summative performance task, which is also a gap analysis case study, it also seeks to support further learning of the problem-solving approach so that students can formally collect both qualitative and quantitative data to validate the existence of a gap caused by organizational factors and support the design of innovative solutions that will result in improvement.

In order to support learning of the problem-solving approach, students learn to apply the basic principles of descriptive statistics, testing, measurement, interviewing, and surveying during this three-week module. The module helps them scaffold the different requirements of their summative assessment, while providing formative feedback along the way, ensuring mastery of learning outcomes. As a design choice, I added the development of a logic model for the problem being studied to the module, so that students can continue to increase their competency in program theory and understand the relationship with evaluative inquiry. Also, students will design a blueprint based on their goals and evaluation questions and align their instruments with the data needed to be collected. After, they learn to design effective interviews and survey items that will allow them to obtain needed data. Additionally, they learn to use productivity tools such as Excel to record, process, and display the data they collect.

As a design choice, I also included a best practices component in this module, to ensure best data collection practices and also address best assessment practices in educational settings, as it was an identified gap in Table 14. However, this component could also be included in a core course. For instance, EDF 7494 is taught simultaneously with EDA 7101, Organizational Theory, as this core class informs the organizational causes behind the gap analysis case study

performance task being completed for both EDA 7101 and EDF 7494. Thus, the best assessment practices component could also be included in EDA 7101 and perhaps include more of the gap analysis components in EDF 7494, at the instructor's discretion.

As with the first research course, module three also addresses the role of literature in research studies, revisiting the topic with an increased level of sophistication consistent with the spiral curriculum model (Harden & Stamper, 1999), as students practice effective reading and summarizing and best practices in selecting quality literature dependent on their appropriateness, scholarliness, and timeliness. This literature review is also used to support the gap analysis problem description and causal and solution analyses to include the selection of instruments to collect data and the overall evaluation plan.

Modules four and five deal with the actual gap analysis case study assigned to student teams, as students prepare their formal IRB submissions, and present project advances to receive formative feedback. Unlike in the previous course, students complete this gap analysis culminating task in groups, given that it requires a higher level of sophistication, as students submit their IRB application to collect actual quantitative and qualitative data to support their study. In order to facilitate this process, module four requires that students complete a work preferences inventory to gain better understanding of their group working preferences and avoid conflict as they collaborate on the gap analysis or any other project at their practice.

Finally, I included a sixth module in the design to further the acquisition of evaluative inquiry skills and introduce students to the model for improvement (Langley et al., 2009) to provides the framework for the following research continuum course. As students propose the Kirkpatrick evaluation plan that they will carry out to validate their solutions, they are asked to think of other models that could be implemented in a more time efficient manner. As such, they

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are introduced to the use of disciplined inquiry to ensure continuous improvement and individual

capacity building, ensuring that the research course maintains its practitioner-based focus and its

immediate application to professional practices (Bengston et al., 2014), providing a clear

connection to the following research course.

In terms of formative and summative assessments, students have several opportunities to

practice and master learning outcomes. EDF 7494 is discussion based as students collaborate to

work on their summative assessments or discuss different qualitative and quantitative methods

used in different educational published studies, creating many opportunities for informal

formative feedback. Gap analysis project advances to include the CITI training, IRB blueprint,

and draft of the literature provide formal formative feedback, facilitating the construction of

knowledge as students are involved in real-life situated learning (Brown et al., 1989).

To ensure that students are mastering learning outcomes corresponding to the newly

introduced mixed methods knowledge, a summative test is used to assess individual mastery, as

the other summative assessment, the gap analysis case study, is carried out in groups. Finally, I

included an individual reflection component as part of the summative assessment in the form of

an e-portfolio journal entry, further documenting each student's growth, learning, and increased

competency as students progress through the research continuum and value the direct

applicability of learned concepts to their own practices.

Even though EDF 7494 did not incur many modifications during the redesign process, it

still follows the same curriculum design principles described earlier and exhibited throughout the

continuum. It is clear that topics were revisited in increasing levels of difficulty, making

advanced professional educators more competent in the use of inquiry and applied research,

consistent with the spiral curriculum model applied to real-life contexts where they can acquire situated knowledge and skills (Brown et al., 1989; Bruner, 1960; Harden & Stamper, 1999).

As in the previous course, instructional objectives and learning outcomes strongly support the Ed.D. in Curriculum and Instruction program objectives and goal. Moreover, learning outcomes were also written following Anderson and Krathwohl's (2001) taxonomy and are open-ended in nature to facilitate the development of enabling objectives corresponding to the different needs of students and faculty members described in the personas, by utilizing UdL principles, and by prioritizing them with Pratt's (1994) guidelines. In addition, Inquiry as Practice is still the signature pedagogy and architecture for the course, guaranteeing a framework for practitioner-based qualitative and quantitative methods to study problems of professional practice in educational settings. The inclusion of innovative problem-solving pedagogical approaches (CPED, 2015c; Rueda, 2011) and the integration of technology into the curriculum equip scholarly practitioners with the necessary skills to be successful in preparing 21st-century learners. The UbD unit also proposes a weekly schedule for the modules, which is very similar to the existing one, and suggests resources that the instructor may use at his/her discretion to supplement the learning in class or to prepare depending on individual cohort needs.

EDF 7478: Analysis of Data for Complex Problems of Practice

Once students have been exposed to and acquired sufficient theoretical and practical knowledge about the role and use of systemic and systematic inquiry to study complex problems of practice using the gap analysis approach at the cognitive, motivational, and organizational levels to provide research-based innovative solutions, they must learn to further examine and evaluate whether the solutions and proposed changes would actually result in the expected

improvement and solve the performance problems they intended to address (Langley et al., 2009; Rueda, 2011). Students must attain the use of inquiry as routine practice to instill a culture of continuous improvement within learning organizations (Langley et al., 2009). In order to ensure that scholarly practitioners are able to effectively develop the required knowledge and skills, I continued to make design choices that would connect to the main design principles and concepts used, as well as follow the established sequential/integrated model, where research components are completed successively (Manathunga et al., 2004).

The first two courses of the continuum focused primarily on the use of systemic and systematic inquiry in professional practice to examine complex problems of practice through multiple lenses with the aim of designing innovative solutions. They also introduced students to program theory, logic models, and their connections to program improvement. This third course advocates the use of disciplined inquiry to anchor practice improvement (CFAT, 2015) through the use of iterative cycles of change to guide a focused learning journey, which will result in using data to determine whether an implemented change yielded the desired improvement and inform practice (Gazza, 2015; Langley et al., 2009). Therefore, this third course was based on Langley et al.'s (2009) Model for Improvement, which provides a framework to drive all improvement efforts in an organization. Tables 26, 27, and 28 depict the UbD curriculum unit for EDF 7478, Analysis of Data for Complex Problems of Practice.

Table 26: UbD Curriculum Map for EDF 7478 Data, Analysis of Data for Complex Problems of Practice—Stage 1

Stage 1 – Desired Results

Established Goals (G):

Ed.D. Program Goal: The Ed.D. in Curriculum and Instruction program will prepare scholarly practitioners to critically examine complex problems of educational practice in context through the use of inquiry as practice with the aim of designing innovative solutions that will effect positive change.

Ed.D. Program Objectives:
3. Engage in systematic inquiry to analyze complex problems of educational practice.
4. Design, develop, and implement innovative solutions to complex problems of practice.
5. Apply the principles of improvement science and evaluation to build organizational capacity and effect practice/program improvement.
6. Use evaluative inquiry to assess various alternative solutions to complex problems of practice and determine the most suitable one.
7. Create a positive impact on an organization, employer, or the community as an agent of change.

Overall Instructional Objectives:
➢ *Students will be able to independently use their learning to:*
○ Understand the connection between program theory and improvement science.
○ Use qualitative and applied quantitative analysis to establish the need for organizational "change" and to determine the effectiveness of the implemented change(s) for results in the desired improvement.
○ Create, develop, and implement an improvement initiative to address a complex problem of practice at an educational organization.

Understandings: (U) *Students will understand that… (big idea)*	**Essential Questions: (Q)**
● Effective learning organizations must engage in continuous improvement in order to effect positive change and growth that seeks to enhance teaching and learning practices to increase performance and achieve organizational goals.	● What is the connection between program theory, evaluative inquiry, and program improvement? ● What are the fundamental principles of improvement? ● What is a change that results in improvement? ● How can we know when a change results in an improvement? ● What changes can we make that will result in improvement? ● What role does a literature review play in the organizational improvement process?

Stage 1 – Desired Results	
	- How can we use qualitative and quantitative data to support improvement and growth? - What is the relationship between improvement science and evaluative inquiry/evaluation?
Students will know… **(K)** 1. Introduction to Improvement Science. - Improvement for Learning: Model for Improvement Framework (3 essential questions and PDSA cycle). 2. Literature Review Best Practices: making research-based decisions to support change and growth. 3. Qualitative Methods 4. Applied Quantitative Methods 5. Introduction to Evaluative Inquiry and Formative Evaluation Studies.	*Students will be able to…* (S) (Learning Outcomes) 1.1 Define "change" and "improvement" in the context of improvement science. 1.2 Create a Logic Model for the program/unit being evaluated. 1.3 Articulate how the framework for the Model for Improvement can be used to turn ideas into action and learning. - Define the scope of an improvement effort. - Support a change with data. - Develop a change. - Test a change. - Implement a change. - Spread improvements. - Consider the human side of change. 1.4 Use the PDSA (Plan-Do-Study-Act) cycle to build profound knowledge and test/implement a change that can be applied to practice for improvement. 2. 1 Apply literature review principles (appropriateness, timeliness, scholarliness) to support the "planning stage" in an improvement initiative. 3. 1 Apply suitable qualitative research methods to collect, analyze, and present data that will inform the improvement decision process. 4. 1 Apply suitable applied quantitative research methods to collect, analyze, and present data that will inform the improvement decision process. 5.1 Use education technology applications and productivity tools to record, document, analyze and

Stage 1 – Desired Results
<table><tr><td></td><td>disseminate findings. ● 6. 1 Understand the connection between improvement science and evaluative inquiry. ● 6.2 Value the applicability of improvement science to address complex problems of practice at learning organizations.</td></tr></table>

Table 27: UbD Curriculum Map for EDF 7478 Data, Analysis of Data for Complex Problems of Practice—Stage 2

Stage 2 – Assessment Evidence	

Performance Tasks: (T)
 	
• *Authentic (Summative) Assessment (ALL L.O.)*: The culminating performance task will serve as the "backbone" for the whole course. The instructor will look for demonstration of conceptual, procedural, and metacognitive knowledge aligned with the corresponding objectives.
 	
o   Students will work individually/groups (could also be paired with field mentors from learning organizations). This culminating performance will be scaffolded to assess all course units. Please refer to individual course subunit assessments for more details. This PT will also serve as part of the "service" component of the program. The final product will be a report (see below) for the instructor (and field mentor if partnering), and also, the team will share a summary of the results with the class, faculty and organization mentors and leaders (these could be invited as a special event). A technology/productivity component will be incorporated.
 	
*Note: the authentic assessment will also provide an experiential introduction (experiential objective) to program evaluation and sharing of results as a bridge for the following research course.
 	
Evaluative Criteria
● Project Advances 20%
● Final Report 30%
● Self-Reflection 10%
● Literature Review Module 15%
● Quantitative Module 25%
● (Participation)
	Other Evidence: (OE)
	• *Diagnostic Assessment for quantitative unit*
	
	• *Formative Assessments:*
	§ *Informal*
	o Class observations and dialogues (sample case studies, discussions) (1.1, 1.2, 1.3, 1.4, 2.1, 3.1,4.1, 5.1) depending on instructional activities to be used).
	
	§ *Formal*
	o Project advances
	   ● Program description/Logic Model (1.1-1.4)
	   ● PDSA Cycles
	     ○ **Plan** = Lit review + formative assessment/needs-assessment + materials (1.1-1.3, 2.1)
	     ○ **Do** = Implement plan (note which other units/programs could benefit from this) (1.1, 1.3, 1.4)
	     ○ **Study =** mixed methods data collection, processing and presentation (1.3,1.4, 3.1, 4.1)
	       ■ Qualitative Instruments + IRB
	       ■ Quantitative analysis
	     ○ **Act** = change analysis/review/next steps/support. Create fishbone diagram/process flow diagram to illustrate continuous improvement iterations (1.3, 1.4, 2.1)
	   ● Literature Review Module
	   ● Quantitative Module
	   ● (Participation)
	• *Summative Assessments*

Stage 2 – Assessment Evidence	
	o *Authentic Assessment:* Model for Improvement Final Project (1.1-6.2). • *Other* o Self-reflection to e-portfolio (6.2).

Table 28: UbD Curriculum Map for EDF 7478 Data, Analysis of Data for Complex Problems of Practice—Stage 3

Stage 3 – Learning Plan
Learning Activities: (L) Week 1 - Introduction to Improvement Science/Evaluative Inquiry Week 2 - Program Theory: Logic Models/Tree Diagram (or other) to organize improvement process. Week 3 - Model for Improvement Framework: What are we trying to accomplish? How will you know that change is an improvement? What obvious changes can be made? Full Program Description assigned. Week 4 -5 PDSA Cycle + Literature Review Module - assignment + "Plan phase" + IRB Week 6 - Qualitative Methods Module (review). Plan implementation - "Do Phase" Week 7 -12 Quantitative Methods - "Do, Study, Act" Week 13- Second PDSA cycle Week 14- Using Evaluative Inquiry for Capacity Building (connection to next course) Week 15- Final Projects/Self-Reflection/Presentations Suggested Resources *Textbooks* Byrk, A. S., Gomez, L. M., Grunow, A., & LeMahieu, P. G. (2015). *Learning to improve: How America's schools can get better at getting better*. Boston, MA: Harvard Education Press. Langley, G. J., Moen, R. D., Nolan, K. M., Nolan, T. W., Norman, C. L., & Provost, L. L. (2009). *The improvement guide*. San Francisco, CA: Jossey-Bass. (main) *Articles* Byrk, A. S. (2015). Accelerating how we learn to improve. *Educational Researcher*, *44*, 467-477. Bryk, A. S., Gomez L. M., & Grunow A. (2010). *Getting ideas into action: Building networked improvement communities in education*. Stanford, CA: Carnegie Foundation for the Advancement of Teaching. Cobb, P., Confrey, J., diSessa, A., Lehrer, R., & Leona, S. (2003). Design experiments in educational research. *Educational Researcher*, *32*(1), 9-13. Donovan, S.M. (2013). Generating improvement through research and development in education systems. *Science*, *340*(6130), 317-319. W. K. Kellogg Foundation. (2004). *Logic model development guide*. Retrieved from: http://www.wkkf.org/resource-directory/resource/2006/02/wk-kellogg-foundation-logic-

Stage 3 – Learning Plan
model-develop   *Websites* Carnegie Foundation for the Advancement of Teaching www.carnegiefoundation.org

Adapted from Wiggins & McTighe (2005)

Unlike the first two research courses of the continuum, which were redesigned with the

inclusion of existing curriculum components, EDF 7478 was redesigned in its entirety. The

decision to restructure this course was made based on two different components. First,

information obtained from the initial course data review and from conversations held with Dr.

David Boote highlighted the fact that the existing course curriculum focuses primarily on

statistical methods and includes some qualitative reporting towards the end of the semester,

without clearly including other important topics or connections with improvement, literature, or

evaluative inquiry. Moreover, it seems to follow a more theoretical approach to teaching and

learning, which is better aligned with theoretical doctoral programs. Second, based on ongoing

discussions during biweekly meetings with Dr. Boote about the Carnegie Foundation for the

Advancement of Teaching's current focus on the use of improvement science to improve K-12

schools and other learning organizations, accelerate how we learn to learn (CFAT, 2015), and the

importance of using evaluative inquiry to ensure continuous improvement, I elected to use the

principles of improvement science to restructure and innovate the research continuum. To that

effect, this third course was designed to deepen the understanding that effective learning

organizations must engage in continuous improvement in order to effect positive change and

growth to enhance teaching and learning practices, thus reflecting the hallmark of the scholarly

practitioner as transformational agent of the educational landscape. In addition, to introduce and provide an opportunity for students to delve into design-based research principles, in preparation for the program's capstone project, I selected Langley et al.'s (2009) Model for Improvement as the architectural framework of choice to develop this course, which was originally developed for the health care industry, has now been successfully used in many industries, and has made its way into education as a model that provides immediate and effective feedback about change and continuous improvement, establishing them as seminal researchers in the field.

EDF 7478 also follows Burner's (1960) spiral curriculum model, revisiting topics learned in the previous courses, and increasing the complexity of topics by studying them in more depth and by adding newer knowledge (Harden & Stamper, 1999). To this effect, I also designed the course using backwards design principles, considering the most effective way for students to achieve the desired results (Wiggins & McTighe, 2005). Consequently, after establishing the course's instructional objectives and its enduring understandings, I proceeded to develop the authentic assessment for the course (see Appendix H), by using Langley et al.'s (2009) Model of Improvement as a frame for curricular development. According to Langley et al. (2009) "the Model for Improvement consists of a set of fundamental questions that drive all improvement and the Plan-Do-Study-Act (PDSA) Cycle" (p. 23).

The model begins by defining "the first, second, and third improvement questions" (Langley et al., 2009, p. 24): what a person, team, or organization is trying to accomplish, how will they know if an implemented change results in improvement, and what changes can be made that will be conducive to the desired improvement (Langley et al., 2009). Once these questions have been answered, the answers are used to develop tests and apply changes through the use of the PDSA Cycle, as a trial-and-learning methodology (Langley et al., 2009). The effective

execution of the PDSA Cycle requires the correct application of qualitative and quantitative methods to support change and improvement data (Langley et al., 2009), providing yet another supporting factor for the design choices made for the development of this course. As such, the use of the Model for Improvement as a guiding framework creates further opportunities for scholarly practitioners to become proficient in the use of inquiry to study complex problems of practice and apply sophisticated mixed methods techniques to make data-driven decisions and effect positive change in the form of improvement.

The course is framed around five distinct modules, which contain all the necessary enduring understandings in direct alignment with each stage of the Model for Improvement framework. Module one introduces students to the Model for Improvement framework in detail, teaching them how to identify and answer the three improvement questions, and provides an overview of the PDSA cycle over a period of three weeks. In this module, students learn about how they will develop and implement an improvement initiative to address a complex problem of practice using the Model for Improvement throughout the semester and how each module has been developed to support this study. Students will select a course or unit that has proven to be challenging for their students from one of their own classes or will select an aspect of an organizational program that needs improvement. If this is not possible due to the students' practice, they can also design a unit based on the model to carry out with their students. At this stage, students will provide a detailed description of their unit or program and a sophisticated logic model or different process diagram to organize the improvement process, thus familiarizing students with other methods and tools to organize information and examine complex problems of practice, their causes, and innovations (solutions) to be implemented. Likewise, students will

answer "the first, second, and third improvement questions" (Langley et al., 2009, p. 24) prior to conducting the PDSA cycle.

The second module revisits the role and importance of reviewing the existing literature to make research-based decisions to support change and growth. The first stage of the PDSA Cycle is to plan the change(s) to be implemented and support the design choices used to improve the selected unit or program. Accordingly, this module seeks to further allow students to construct knowledge about literature review best practices at a more complex level and increase their competency (Harden & Stamper, 1989). This module was designed to also include a formal formative assessment, where students demonstrate mastery as they evaluate the quality of publications or dissertations by their use of literature according to the previously learned principles of appropriateness, timeliness, and scholarliness. This formative assessment aims to ensure mastery of the topic so that students can use their literature reviews effectively in support of their plan for the summative assessment, including causes of the problem and including knowledge and skills learned when carrying out the gap analysis in the two prior courses. In addition, this formative assessment also provides a context for students to create connections between concepts learned throughout the continuum and construct new knowledge as they engage in meaningful experiences (Savery & Duffy, 1996; Smaldino et al., 2012).

The third and fourth modules were designed to incorporate qualitative and applied quantitative methods in support of the "Do" and "Study" stages of the PDSA Cycle. As students implement their designed changes, they must ponder what type of qualitative and quantitative data must be collected to support that the change being implemented actually results in an improvement and provides immediate formative feedback. For these modules, students revisit the material learned in the previous course and identify or design new qualitative instruments

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(surveys, interviews, focus groups, etc.) to document the impact of the change. They must also select the appropriate applied statistics methods that will be used to substantiate the desired improvement.

In order to accomplish this, Module 4 was designed to help students further their statistical knowledge and understand that quantitative data analysis can be seen as comparisons (correlations) or differences according to different levels of measurement that describe the relationships among data values. Given that this is a program for advanced professional practitioners, mixed methods courses like this one must be designed following an applied learning or cognitive apprenticeship model, where knowledge is acquired as a result of the activities and situations presented (Brown et al., 1989). Further, students should use tools that are readily available for educators at their institutions, such as Microsoft Excel instead of SPSS, which fits the need of a program based on non-traditional research dissertations while also providing a solid foundation for a future research career (DiMaria-Ghalili & Ostrow, 2009). However, the option of using SPSS is also available to advanced students as enrichment. To illustrate these needs and principles, a detailed prototype subunit for Module 4 was also developed (see Appendix E).

As mentioned previously, this subunit was designed based on the applied nature of the professional practice program, taking into consideration data-oriented approaches and using real-world data to develop students' interest and support the growth of statistical reasoning skills, while differentiating them from theoretical research courses traditionally found in Ph.D. programs (CPED, 2015d; Leech & Haug, 2015; Shaughnessy, 2003). Pedagogical and assessment models using Excel were incorporated into the curriculum design. These include the use of a pre-assessment, presence of clear weekly plans, having a standard textbook as reference,

face-to-face workshop sessions where students are familiarized with the different statistical tests, assignments using real educational data at home, providing extensive feedback using dual coding, and the application of concepts learned to the course's performance task using the Model for Improvement (Azuero et al., 2013; DiMaria-Ghalili & Ostrow, 2009; Lauver & Phalen, 2012; Smaldino et al., 2012). The course was also designed based on current statistics teaching and learning theories, which explain that research courses should be constructed so that students can act as learners, consumers, and producers at their jobs of practice-based research through the use of normative, perspective, and descriptive statistical frameworks (Shaughnessy, 2003).

When considering the instructional design of the applied quantitative module subunit, I used constructivist principles such as assessing prior knowledge, considering individual difference, stating learning objectives or outcomes, and developing metacognitive skills (Smaldino et al., 2012), through the use of research-based instructional practices. One of these instructional practices included the use of the ASSURE model to develop lessons that effectively integrate technology into the curriculum with the aim of improving student learning (Smaldino et al., 2012). The ASSURE model is also supported by the TPACK framework, which is the proposed curriculum integration framework for the continuum.

To provide a detailed example of how the ASSURE model can be used to develop lessons for this subunit and any other one in the research continuum and model best practices in the effective integration and use of technology-rich lessons that support a specific content and pedagogical approach, I developed a sample lesson for the fourth topic of the subunit. The complete digital sample lesson, including instructor and learner pages, can be found at http://www.pvclark.weebly.com/. The prototype subunit also demonstrates how the use of the previously identified faculty and student personas guided the design of the curriculum and were

also used to select and include differentiating strategies using both UdL (CAST, 2012) principles (see Table 6) and Pratt's (1994) prioritizing objectives framework (see Appendix E). Examples include using an electronic textbook that has detailed explanations and statistical glossaries that students can access at any time, preparing flexible materials that incorporate visual elements, ensuring contrast between the text used and the background, all providing multiple means of representation (CAST, 2012).

This module also contains several formative assessments, as detailed in Appendix E. Last, the prototype unit also seeks to support my design choices for user-centered principles, showing consistency, constraint, and flexibility as described by Lidwell et al. (2010). Consistency, as the same backward design and other curriculum develop principles were used; constraint, as the curriculum was develop to ensure that the course will provide advanced professional educators with the necessary applied research skills required by practitioners; and flexibility, to adapt the contents and assessments to individual students needs and faculty preferences, as additionally supported by the use of essential questions and open-ended learning outcomes and objectives.

Once students have completed the applied quantitative module, they can apply their learning to analyze and process both qualitative and quantitative data in the "Study" stage to verify that the design choices made during the "Plan" stage resulted in the desired change. This information will then be used in the "Act" stage, where students remove any changes that had no effect and proceed to make any corrections and/or modifications necessary for a new cycle, applying again their literature review skills to support their new lesson plan design choices. During the "Act" stage, students are also required to create a fishbone or process flow diagram to illustrate continuous improvement iterations. The performance task requires students to carry out

the PDSA Cycle at least twice, to substantiate the positive effect of the change implemented and any corrective actions taken to ensure improvement.

After both cycles are finalized, the students must discuss their results, recommendations, and plan for sharing findings and to collaborate with other educators in the organization. The discussion section of the performance task was designed to link to Module 5, where evaluative inquiry is revisited and connected to building capacity in the organizations, as well carrying out formative evaluation studies, providing a foundation for the last research continuum course, which focuses on the evaluation of educational programs.

The performance task also requires students to use forms throughout the improvement initiative implementation process to additionally document their efforts, design, and evaluation process. A sample Model for Improvement form can also be found in Appendix H. The final performance task product must also include all references used in APA format and be submitted as a digital portfolio or website using one of the suggested web development tools. Asking students to submit this course project in electronic format was purposefully done, to promote again the acquisition of education technology skills to support the included learning outcome, with the overall aim of preparing scholarly practitioners to be 21st-century global leaders in education.

A summative reflection component was also included to add to the existing student e-portfolio, which continues to document growth and learning throughout the program as students answer the three improvement questions to demonstrate that they value the applicability of improvement science and disciplined inquiry to address complex problems of practices and foster a culture of continuous improvement at learning organizations. Each module was designed to include a formative assessment component, giving students several opportunities to master the

concepts and apply them in their improvement initiative. These formative assessments were designed to reinforce and/or further their knowledge and skills in the use of mixed methods for improvement in preparation for the authentic assessment, last research course, and capstone project. The UbD unit also provides a schedule overview and suggested resources for instructors and students.

In summary, this third course continues to build from CPED (2015d) Working Principles 4 and especially 5 to provide scholarly practitioners with the skills necessary to use "practical and research knowledge, that links theory with systemic and systematic inquiry" (CPED, 2015c, para. 7), as well as disciplined inquiry to not only design research-based innovative solutions for complex problems of practice but also to build capacity and instill a culture of continuous improvement in educational settings to inform professional practice (CPED, 2015d; Gazza, 2015; Langley et al., 2009). In addition, it continues to follow the spiral curriculum model by revisiting inquiry and research topics throughout the continuum in successive levels of difficulty, presenting new challenges and opportunities, which brings more advanced applications and increased expertise (Bruner, 1960; Harden & Stamper, 1999), while preserving the design choices of using Inquiry as Practice as the signature pedagogy of the program and using the core tenets of improvement science to empower advanced professional educators to become agents of positive change and betterment (CFAT, 2015; CPED, 2015c; UCF, 2015).

EDF 7468: Evaluation of Complex Problems of Practice

Building from the application of disciplined inquiry and improvement science principles to develop a culture of continuous improvement in educational settings, this fourth and last course of the research continuum was designed to expand these concepts by immersing students

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in the study of program evaluation and the use of evaluative inquiry to build organizational

capacity. As the culminating experience of the spiral curriculum, the course provides students

with the opportunity to demonstrate mastery of all Ed.D. in Curriculum and Instruction program

objectives as they apply and connect all previously acquired knowledge and skills. Tables 29, 30,

and 31 illustrate the UbD curriculum unit for EDF 7468, Evaluation of Complex Problems of

Practice.

Table 29: UbD Curriculum Map for EDF 7478 Evaluation of Complex Problems of Practice—
Stage 1

Stage 1 – Desired Results

Established Goals:
 	
Ed.D. Program Goal: The Ed.D. in Curriculum and Instruction program will prepare scholarly practitioners to critically examine complex problems of educational practice in context through the use of inquiry as practice with the aim of designing innovative solutions that will effect positive change.
 	
Ed.D. Program Objectives:
1. Identify and understand issues of learning, development, motivation, and organizational theory.
2. Name, frame, and critically examine complex problems of educational practice through multiple perspectives.
3. Engage in systematic inquiry to analyze complex problems of educational practice.
4. Design, develop, and implement innovative solutions to complex problems of practice.
5. Apply the principles of improvement science and evaluation to build organizational capacity and effect practice and/or program improvement.
6. Use evaluative inquiry to assess various alternative solutions to complex problems of practice and determine the most suitable one.
7. Create a positive impact on an organization, employer, or the community as an agent of change.
 	
Overall Instructional Objectives:
➢ *Students will be able to independently use their learning to:*
    ○ Understand the basic principles, approaches, methodologies, data analysis, and dissemination of findings in program evaluation design.
    ○ Synthesize published research and other readings to support their understanding

Stage 1 – Desired Results	
of the discipline and profession of evaluation. ○ Design an evaluation plan to determine the success of a program at an organization using the most appropriate evaluation methodologies.	
Understandings: *Students will understand that… (big idea)* ● Program evaluation is a necessary and vital step of improvement in an educational system, as well as a responsibility for anyone overseeing a program. The main purpose of program evaluation is to provide the basis for making effective data-driven decisions and recommendations about the success of the program, through the use of mixed methods, which increase the validity of an evaluation as it promotes data triangulation and evaluation through multiple lenses.	**Essential Questions:** ● How does evaluation lead to program improvement? ● How can evaluative inquiry be used to empower educators by building individual and organizational capacity in a learning organization? ● What is the role of data in evaluation studies? ● How does the use of mixed methods increase the validity of an evaluation study? ● How can we determine the most suitable evaluation design for a study?
Students will know… ● 1. Introduction to Evaluation ○ Uses and Brief History ○ Formative vs. Summative ○ Internal vs. External ○ Evaluation vs. Research ● 2. Issues, Ethics, Standards & Guiding Principles ● 3. Approaches to Evaluation ○ Presentations ○ Participatory Approach and Capacity Building ○ Related Research ● 4. Summative Assessment Description and Program Selection ○ Program Identification ○ Program Description ● 5. Planning Evaluations ○ Program Theory and Logic Models ○ Evaluation Questions ○ Evaluation Criteria and Standards ○ Schedules ○ Budgets/Agreements	*Students can:* ● 1.1 Understand the history, influences, and evolution of evaluation across disciplines. ● 1.2 Understand classic, current, and new directions for research on evaluation. ● 1.3 Differentiate between formative and summative evaluations. ● 1.4 Differentiate between internal and external evaluation/evaluators. ● 2.1 Apply evaluation standards to identify political, social, ethical, and methodological problems in professional practice necessitating further investigation. ● 3.1 Examine and critique the conceptual distinctions between contemporary theories of evaluation practice. ● 3.2 Identify and critique published evaluation studies and formulate sound

Stage 1 – Desired Results	

● 6. Conducting Evaluations and Use
  ○ Design and Validity Issues
  ○ Instruments
  ○ Data Sources
  ○ Methods
  ○ Data Analysis
  ○ Considerations: Diversity
  ○ Reporting of Findings and Maximizing Use
	inferences grounded on data.
	● 3.3 Apply advanced research skills to acquire peer-reviewed research to support professional practice.
	● 4.1 Identify and describe a complex problem of practice to be evaluated.
	● 5.1 Plan a formative/summative evaluation utilizing principles of program theory and effective evaluation practices.
	● 5.2 Use education technology software applications and productivity tools to process, display, and analyze data, and document academic growth.
	● 6.1 Demonstrate understanding of sound research methodology, evaluation, and dissemination of findings.
	● 6.2 Identify what quantitative and qualitative data must be collected to address evaluation questions.
	● 6.3 Report evaluation results to maximize use and understanding.
	● 7.1 Communicate professional positions in a scholarly manner in both written (APA Publication Manual) and oral modalities.
	● 8.1 Value the applicability of evaluative inquiry to effect program improvement.

Table 30: UbD Curriculum Map for EDF 7478 Evaluation of Complex Problems of Practice—Stage 2

Stage 2 – Assessment Evidence	
Performance Tasks: • *Authentic (Summative) Assessment (ALL L.O.)*: The individual culminating performance task (Evaluation Project) will serve as the "backbone" for the whole course. The instructor will look for demonstration of conceptual, procedural, and metacognitive knowledge aligned with the corresponding objectives. o This culminating performance will be scaffolded to assess all course units. The final product will be a paper for the instructor, and a poster presentation (this could be planned as a special event). A technology/productivity component will also be incorporated. Evaluative Criteria ● Presentations 30 % ● Evaluation Critique 5% ● Exams 20% ● Evaluation Project 30% ● Participation/Discussions 10% ● Reflection (e-portfolio) 5%	Other Evidence: • *Formative Assessments:* § *Informal* o Quizzes (1.1-5.1, 6.1- 7.1) o Class observations, discussions, and dialogues (1.1-4.1). § *Formal* o Alternative Approaches Group Presentation: short hands-on presentations in class of selected approaches. (3.1-3.3, 5.2) o Expert Interview Multimedia Presentation: multimedia presentation/podcast will be uploaded to discussion area in Webcourses, and students will listen to them and engage in professional conversations about them (online activity). Will be considered in the presentation rubric. (3.1-3.3,5.2) o Evaluation Reporting (Digital Storytelling) (5.1-5.2,6.1-6.3, 8.1). o Evaluation Critique of Related Research (7.1) • *Summative Assessments* o Midterm Exam (1.1-3.3) o Final Exam (5.1 - 7.1) o Authentic Assessment: Individual Evaluation Plan Project and Reflection (eportfolio) (4.1-8.1) • *Other* o Attendance/Participation/Discussions (8.1)

Table 31: UbD Curriculum Map for EDF 7478 Evaluation of Complex Problems of Practice—Stage 3

Stage 3 – Learning Plan
Learning Activities: (L) Week 1 - Introduction to Evaluation Week 2 - Issues, Ethics, Standards and Guiding Principles Week 3 - Approaches to Evaluation Week 4 - Approaches to Evaluation Week 5 - Participatory Approach and Capacity Building Week 6 - Summative Assessment Description and Program Selection Week 7 - Program Theory and Logic Model Development Week 8 - Planning Evaluations Week 9 - Midterm Week Week 10 - Planning Evaluations Week 11 - Conducting Evaluations and Use: Design, Validity, Methods, Data Collection and Analysis Week 12 - Conducting Evaluations and Use: Reporting of Findings Week 13 - Conducting Evaluations and Use: Diversity Week 14 - Individual Project and Reflection Week 15 - Final Exam Suggested Resources *Textbooks* Fitzpatrick, J., Christie, C., & Mark, M. (2009). *Evaluation in action: Interviews with expert evaluators*. Thousand Oaks, CA: Sage. Fitzpatrick, J. L., Sanders, J. R., & Worthen, B. R. (2011). *Program evaluation: Alternative approaches and practical guidelines* (3rd ed.). New York, NY: Longman. Posavac, E. J., & Carey, R.G. (2003). *Program evaluation: Methods and case studies* (6th ed.). Upper Saddle River, NJ: Pearson Education. Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). *Evaluation: A systematic approach* (7th ed.). Thousand Oaks, CA: Sage. Stufflebeam, D. (2001). *Evaluation models: New directions for evaluation*. San Francisco, CA: Jossey- Bass. *Articles* Askew, K., Beverly, M., & Jay, M. L. (2012). Aligning collaborative and culturally responsive evaluation approaches. *Evaluation and Program Planning*, *35*(4), 552-557 Fetterman, D., & Wandersman, A. (2007). Empowerment evaluation: Yesterday, today, and tomorrow. *American Journal of Evaluation*, *28*(2), 179-198.

Stage 3 – Learning Plan
Websites www.eval.org American Evaluation Association www.oerl.sri.com Online Evaluation Resource Library

Adapted from Wiggins & McTighe (2005)

Tables 29, 30, and 31 show that the course was slightly restructured during the redesign process when compared to the course curriculum map information sheet (see Appendix F), which was completed from existing syllabi, lessons, and assessments data. Even though this course was always the culminating learning experience of the Ed.D. in Curriculum and Instruction research continuum, it was originally designed as part of a three-course continuum and included a larger scope and sequence than the one depicted in the proposed UbD unit. Likewise, analysis of the existing course data did not immediately reveal that the original continuum design process not include improvement science principles in the Inquiry as Practice (CPED, 2015c) framework.

To this effect, the design choices and solutions used during the curriculum redesign process were selected to provide a logical transition from the previous course, where the Model for Improvement (Langley et al., 2009) was used to build individual capacity for continuous improvement through change analysis. In addition, the redefinition of learning outcomes and the development of technology-rich formative assessments and rubrics were done based on conversations, e-mail communications, and in-person meetings held with Dr. Bonnie Swan, instructor of the course. Dr. Swan added me as a designer for this course on Webcourses, giving me full access to existing course information, as well as involving me in the course setup to the learning management system. I shared the developed course items with Dr. Swan to engage in collaboration and used her valuable feedback to make necessary modifications. The finished

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approved learning outcomes and technology-rich formative assessments were piloted this semester in Dr. Swan's class, and preliminary reports from her and students are very positive (B. Swan, personal communication, April 11, 2016).

In similar fashion to the previous course, EDF 7468 was restructured into six modules framed around its culminating performance task to ensure that students understand that curriculum evaluation is a necessary and vital step of improvement in an educational system, as well as a responsibility for anyone overseeing a program, and that its main purpose is to provide the basis for making effective data-driven decisions and recommendations about the success of the program. Further, the use of mixed methods increases the validity of an evaluation as it promotes the triangulation of data through multiple lenses. These enduring understandings clearly embody the program's Signature Pedagogy of Inquiry as Practice, which requires scholarly practitioners to design innovative solutions for complex problems of practice through the use of different research and theories and the use of data to critically understand the effect of improvement (CPED, 2015c). Likewise, these enduring understandings reinforce the principles of improvement science and apply them to build organizational capacity through the use of formative feedback and continuous learning (Fitzpatrick et al., 2011; Langley et al., 2009).

The first three modules were designed to equip students with the necessary foundational knowledge and skills to carry out the culminating performance task successfully. Module 1 introduces students to the practice, history, and core tenets of evaluation. Consistent with Bruner's (1960) spiral curriculum model, it revisits research concepts learned throughout the continuum with increased levels of complexity (Harden & Stamper, 1999) as students distinguish evaluation from research. During the second module, students also become familiar with issues in evaluation—ethics, standards, and guiding principles—through the use of hands-on activities

in the classroom, which promote cognition and learning in real-world contexts (Brown et al., 1989). The third module presents the different approaches to evaluation and, building from the previous course, places special emphasis on participatory approaches and evaluation capacity building. This design choice is also substantiated in the fact that professional educators in the Ed.D. in Curriculum and Instruction program must engage in evaluative inquiry to develop innovative solutions for complex problems of practice to effect positive change, as supported by program objectives 5, 6, and 7, as well as CPED (2015d) Working Principles 2, 3, and 4.

Just as with modules one and two, module three's contents were left intact, as it already had a constructivist and innovative teaching and learning approach requiring students to create presentations with hands-on activities to share the alternative approaches to evaluation with their peers, providing again authentic learning experiences which will result in meaningful learning (Brown et al., 1989; Smaldino et al., 2012).

As a supplement, the original course also required students to carry out an expert interview presentation, where pairs of students share a case study about one of the alternative approaches with the class. During the redesign process, I modified the assignment to include the use of education technology applications such as recorded multimedia presentations, podcasts, or videos. This formative assessment was redeveloped using the TPACK (2009) framework guidelines, ensuring that technology is used to enhance student learning and to help students acquire digital age skills (Mishra & Koehler, 2006). The developed and implemented prototype formative assessment and accompanying rubric can be found in Appendix I. The expert interview assessment was also created using differentiation strategies, as students have the opportunity to choose how they will present the product according to their level of proficiency, providing multiple means of action and expression (CAST, 2012).

Once students have acquired the necessary knowledge to carry out the summative performance task, they are introduced to module four, where they will select a program and describe it for their evaluation plan. This is a slight change from the original course, which introduced the culminating task later in the course. Module 4 requires students to also apply previously learned concepts about how to identify a complex problem of practice and how to describe it using existing data and literature.

In the same manner, Module 5 continues to build from previously learned concepts about program theory and logic models, as students develop a sophisticated logic model to guide them in the generation of suitable evaluation questions, criteria, standards, schedules, and budgets for their culminating task drawing from class contents. Module 6 focuses on conducting evaluations and the use of findings, addressing design and validity issues, as students prepare to select the most appropriate instruments for the needed data sources and a methodology for the evaluation. After that, it continues to require students to apply the knowledge and skills acquired on qualitative and quantitative methods to describe the type of data analysis to be carried out. Although students will prepare only an evaluation plan for the course, the design used principles of flexibility (Lidwell et al., 2010) to allow for the formation of partnerships with internal or external organizations to provide students with real-life scenarios and expose them to new situations and activities that allow for the construction of new knowledge (Brown et al., 1989).

Last, the course delves into considerations surrounding diversity and the importance of reporting findings to maximize their use. Given that evaluation reporting is at times not prioritized enough, tailored to a particular type of audience, or done in an engaging manner (Fitzpatrick et al., 2011), I designed a formative in-class activity where students use principles of digital storytelling to disseminate evaluation findings. Once again, this learning activity provides

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multiple means of action and expression and multiple means of engagement by providing options for student choice and autonomy and multiple tools for construction and composition (CAST, 2012). The learning activity and sample hyperlinked product can also be found in Appendix I. As with previous technology-based learning experiences, this one was also designed to help educators acquire education technology skills that they can then use with their own students to foster 21st-century learning (ISTE, 2016).

The course curriculum design also includes a variety of other formative and summative assessments, in addition to the culminating task. Informal formative quizzes based on their readings and class information prepare students for their summative midterm and final exams. Besides the previously described presentations, students also carry out an evaluation critique of related research, asserting their competency in identifying high-quality literature, as well writing in a scholarly manner using APA guidelines. Class presentations require students to share via discussion boards in Webcourses and to engage in professional conversations.

Finally, as students submit their culminating task, they also write the fourth and final e-portfolio reflection, describing their learning and growth throughout the research continuum and program. The UbD unit also provides suggested resources, to include the currently used textbooks, and some articles to support the culminating task. Likewise, it provides a semester schedule overview for the different modules.

EDF 7468 not only immerses students in the application evaluative inquiry for learning, but it also provides a platform to solidify, master, and demonstrate all the knowledge and skills acquired throughout the research course continuum. Just as EDF 7478 prepared students for the principles of design-based research, this course prepares them to carry out evaluation-based research for their capstone projects. The use of broad overall instructional objectives, learning

outcomes, scope and sequence, instructional activities, and assessments are in agreement with the selected user-centered design principles, which permit the tailoring of the lesson to individual teacher and learner needs as shown in the sample assessments provided. Additionally, the course provides a culminating experience for the spiral curriculum model by revisiting and connecting all inquiry and research topics learned throughout the continuum at the advanced expectation level as supported by the curriculum map (see Table 19), presenting new challenges and opportunities to apply concepts learned and demonstrate increased expertise (Bruner, 1960; Harden & Stamper, 1999). It also endorses the use of Inquiry as Practice and the core principles of improvement science to prepare scholar practitioners to become agents of change who have a positive impact on organizations and communities (CFAT, 2015; CPED, 2015c; UCF, 2015).

Summary

In conclusion, the UbD units developed for each course of the research continuum provide additional evidence of how these courses produce the overall Ed.D. in Curriculum and Instruction program goal and objectives, as also shown in the curriculum maps developed in Chapter 3. The use of backward design principles (Wiggins & McTighe, 2005), Anderson and Krathwohl's (2001) Taxonomy for Learning, Teaching, and Assessing for creating and redefining learning outcomes, and other design choices and solutions employed ensured that any possible preexisting gaps and redundancies (see Table 12) were addressed and eliminated during the curriculum redesign process.

UbD units provide an in-depth explanation of how each course subunit in alignment with specific learning outcomes and assessments supports the previously developed research course curriculum maps, with increasing levels of complexity throughout the continuum, requiring

students to apply previously learned knowledge and skills in real-life situations and contexts to reach the desired proficiency level through the use of a spiral curriculum model (Brown et al., 1989; Bruner, 1960; Harden & Stamper, 1999). The use of the CPED Working Principles 4 and 5 (2015d), Inquiry as Practice (CPED, 2015c) as the building framework and the principles of improvement science during the redesign process guarantee the acquisition of systemic, systematic, and disciplined inquiry knowledge and skills through the use of authentic and active learning experiences in context, which are integral to cognition and learning of applied quantitative and qualitative methodologies that advanced professional educators need (Brown et al., 1989; CPED, 2015d; Shaughnessy, 2003). Moreover, the development and use of authentic assessments throughout the continuum, aligned with all learning outcomes and instructional activities, gives students the opportunity to examine complex problems of practice in context and design innovative solutions for continuous improvement, supporting the hallmark of the program, which aims to prepare scholarly practitioners to create a positive impact at their organizations and act as agents of change (CPED, 2015c; UCF, 2015).

CHAPTER FIVE: SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Introduction

Since the inception of the CPED Consortium in 2007, redesign efforts targeting the strengthening of the professional doctorate of education (Ed.D.) programs by consortium members have focused on addressing the continuous arguments regarding the rigor, validity, and function of the Ed.D. program and the advanced preparation of scholarly practitioners (CPED, 2015a; Deering, 1998; Rueda et al., 2013). The scholarly practitioner is able to use practical research and applied theories to effect change by naming, framing, and solving complex problems of practice (CPED, 2015c). In order to support the development of scholarly practitioners, CPED offers six Working Principles and Design Concepts as a blueprint to guide the redesign of Ed.D. programs (CPED, 2015c, 2015d). These guidelines clearly frame the need to redesign professional doctorate programs by ensuring that the roles of applied research and practical theory remain central to the preparation of scholarly practitioners through the use of Inquiry as Practice (Bengston et al., 2014; CPED, 2015c; Perry, 2015; Shulman et al., 2006).

UCF has been involved in Ed.D. redesign initiatives since the beginnings of the program in 1982 in order to develop a more practice-based program focusing on research and inquiry (Boote, 2008). As an active and founding CPED member, UCF continues to engage in Ed.D. redesign efforts following the recommended Working Principles and Design Concepts, in order

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to provide students with substantial research expertise that can be applied in their professional practice.

The role of inquiry in the preparation of scholarly practitioners is somewhat different than in traditional research doctoral programs; thus, redesign efforts must ensure that the use of inquiry focuses on studying problems of practice in context, rather than simply filling the gaps of the existing body of knowledge (Bengston et al., 2014). Inquiry as Practice is the process of critically examining complex problems of practice with the aim of designing and evaluating innovative solutions to improve professional practices (CPED, 2015c). Similarly, it "requires the ability to gather, organize, judge, aggregate, and analyze situations, literature, and data with a critical lens" (CPED, 2015c, para. 4). Therefore, it is evident that the professional doctorate research courses must drive program redesign efforts, as these define the applied nature of the program, increasing its rigor and validity. Further, they assert the indispensable purpose of he Ed.D. program for preparing advanced professional educators, differentiating it from Ph.D. programs, and positioning it at the same level of acceptance (Shulman et al., 2006). Consequently, Inquiry as Practice must be utilized as the main redesign framework for all Ed.D. in Curriculum and Instruction research courses to prepare scholarly practitioners in support of CPED Working Principles 4 and 5. Further, since the study of complex problems of practice and design of innovative solutions implies change, it is imperative to verify that any changes made actually result in the desired improvements (Langley et al., 2009). Hence, research course sequence redesign initiatives should also be framed around the discipline of improvement science principles, to not only instill in scholarly practitioners a culture of continuous improvement but also to develop the know-how necessary to actually accomplish betterment and progress (Byrk, 2015).

Purpose of the Study

Given that Inquiry as Practice preparation relies on the ability of advanced professional educators to collect, analyze, and evaluate literature and data to innovatively solve complex problems of practice (CPED, 2015a; Perry, 2015), the purpose of this Dissertation in Practice was to enhance and enrich the Doctor of Education (Ed.D.) in Curriculum and Instruction research course sequence at the University of Central Florida (UCF) to further ensure the use of applied research and practical theory as central to the development of scholarly practitioners. By clarifying the Ed.D. in Curriculum and Instruction program goal and objectives and individual research course learning outcomes, it was possible to develop detailed curriculum maps to specifically demonstrate how these courses support and align with the use of Inquiry as Practice to ensure that students acquire substantial research expertise that can be effectively applied to solve complex problems of practice. The creation of individual course UbD curriculum maps for the research continuum facilitated the identification of additional evidence of how each course is systematically aligned with the program and how each addresses any existing gaps in the curricula.

Summary of the Study

A design-based research study was conducted to ensure that the Ed.D. in Curriculum and Instruction research course sequence at UCF provides advanced professional practitioners with the necessary applied research skills to design effective innovative solutions for complex problems of practice. The need of this study was established and requested by the core program faculty under mutual consensus, thus a needs-assessment evaluation was not conducted. The study began by conducting a sophisticated literature review to conceptualize and contextualize

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the issues and influences related to the research skills required in the preparation of scholarly practitioners in professional doctorate programs at the organizational and local levels. In agreement with the applied nature of this DiP, review findings were used throughout the study to select, frame, and support design choices and solutions when clarifying the Ed.D. in Curriculum and Instruction program overall goal, objectives, and individual research course outcomes, the development of curriculum alignment matrices, and the redesign of research courses. My review revealed very few research studies addressing the causes behind the existing gap between theory and research in the Ed.D. research continuum, and thus further research is warranted to corroborate the speculated causes.

Summary of Proposed Solutions and Products

Given that the Ed.D. in Curriculum and Instruction at UCF is a practitioner-based program and that the CEDHP is a founding CPED consortium member, it was important to determine how the research course sequence supports the preparation of advanced professional practitioners to design innovative solutions to address complex problems of practice (CPED, 2015a) through the use of the CPED Design Concepts, particularly the use of Inquiry as Practice as the Signature Pedagogy of the Program, and the CPED Working Principles. In order to make this determination, this study sought to redesign the Ed.D. in Curriculum and Instruction research course continuum using the aforementioned design concepts and principles and curriculum design and development best practices.

Goal 1: Clarifying Program Goals, Objectives, and Research Continuum Learning Outcomes

This first goal was successfully accomplished by first clarifying the existing Ed.D. in Curriculum and Instruction goal and learning outcomes developed by the core faculty of the

program, and then redefining the existing research course continuum objectives. In order to accomplish this, program and course data were collected via ongoing personal communications and meetings with faculty members, and from existing course syllabi. The overall program goal and objectives were clarified through an iterative process, taking into consideration ongoing conversations with Dr. David Boote, current core faculty member and former Ed.D. in Curriculum and Instruction program coordinator.

The clarified Ed.D. in Curriculum and Instruction program goal and objectives (Table 10 and Table 11) embody the CPED Design Concepts and guiding principles to redesign professional education doctorates, distinctively framing the program as one that seeks to prepare scholarly practitioners for "the application of appropriate and specific practices, the generation of new knowledge, and for the stewardship of the profession" (CPED, 2015c, para.2), differentiating it in purpose and essence from the traditional research-based doctoral programs in education, as well as supporting the expected program outcomes depicted on the logic model (Appendix A). In addition, they also reflect the choice of integrating improvement science principles as key curriculum redesign framework together with evaluative inquiry as a solution to ensure the applied nature of the research continuum courses needed for the preparation of advanced professional educators. Further, it highlights the goal of the Ed.D. program to use Inquiry as Practice and supports the design choice of incorporating improvement science into the research continuum to build capacity in advanced professional educators to act as agents of change by relying on continuous improvement to innovatively solve complex problems of practice.

Once the overall program goal and objective were clarified, these were used as a foundation to redefine individual research course learning outcomes. Even though the research

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course sequence supports all program objectives, this study primarily focused on aligning Ed.D. in Curriculum and Instruction program objectives 2-6, which specifically pertain to the research continuum. Together with the use of faculty and student personas (Lidwell et al., 2010), the newly redefined Ed.D. in Curriculum and Instruction objectives guided the redefinition of individual research course instructional objectives (Table 13) and learning outcomes (Table 14). These were written using Anderson and Krathwohl's (2001) Revised Bloom's Taxonomy, taking into consideration all types of knowledge in the cognitive dimension and all categories in the cognitive processes dimensions. The process entailed developing overall instructional objectives first and then using these to redefine learning outcomes. Education technology learning outcomes were included as part of the design solutions following the TPACK integration framework to support the innovative nature of the program, as well as current best practices (Harris et al., 2009).

It is important to note that this iterative process underwent many revisions, as I simultaneously designed course curriculum maps, which will be addressed under Goal 3. Revisions were also made based on meetings and discussions with Dr. Boote for the first three courses and Dr. Swan for the last research course. Redefining the learning outcomes in alignment with the program goal and objectives while also drafting outlines for the course curriculum maps units facilitated addressing any of the potential existing gaps and/or redundancies identified in Table 12. As a consequence, instructional objectives and learning outcomes were also composed applying a spiral curriculum model, promoting the in-depth understanding and mastery of topics before building new knowledge throughout the continuum (Bruner 1960; Harden & Stamper, 1999).

Goal 2: Research Course Sequence Alignment Matrices

   The clarified Ed.D. in Curriculum and Instruction program goal and objectives, as well as the redefined research continuum instructional objectives and learning outcomes were used to obtain information about the operating research course sequence curriculum. The created alignment matrices (Tables 15–19) made it possible to identify where individual learning outcomes support the overall program goal, objectives, and expected outcomes described in Appendix A. Likewise, these provide sufficient and conclusive evidence of how individual program objectives are supported by the continuum (Table 15) and also how individual research course learning outcomes support these objectives at the basic, intermediate, and advanced expectation levels (Tables 16–19). This allows graduate students to gradually construct, acquire, and master new knowledge as the level of complexity increases throughout the research continuum in agreement with the chosen spiral curriculum model (Brown et al., 1989; Bruner, 1960; Harden & Stamper, 1999) and with best teaching and learning practices. Students are given sufficient opportunities to acquire inquiry skills through authentic and active learning experiences in context, which are essential to cognition and learning of applied qualitative and quantitative methodologies (Brown et al., 1989; Shaughnessy, 2003; University of Hawaii-Manoa, 2013). Moreover, the curriculum mapping process also clearly ensured the elimination of any previously identified gaps and/or redundancies, as evidenced by how research continuum learning outcomes strongly support the Ed.D. in Curriculum and Instruction program goal and objectives.

Goal 3: Individual Research Course Curriculum Maps

Goal 3 sought to further identify the learning opportunities that produce the Education Doctorate program objectives and to ensure that the research continuum did not have any gaps or redundancies within the curriculum. To this effect, the UbD course curriculum maps (Tables 20–31) were developed using backwards design to provide a more detailed description of individual research course curricula, beginning with the overall program goal and objectives, to ensure that students achieve the expected learning outcomes (Wiggins & McTighe, 2005). The curriculum redesign process was informed by the CPED Working Principles and Design Concepts, improvement science principles, and the identified personas. Similarly, the developed UbD curriculum maps clearly show how user-centered design principles such as consistency, flexibility, control, and constraint allow for the customization of the curriculum to the changing needs and readiness levels of advanced professional educators and faculty backgrounds.

Design choices for instructional activities and authentic assessments markedly highlight the applied nature of the research courses as characteristic of a professional doctoral program rather than the Ph.D. program. In addition, Tables 20–31 also depict how Bruner's (1960) spiral curriculum model was used, as well as how the TPACK framework was applied to develop lessons identifying the most suitable educational technology for the specific pedagogy and content being used in context (Mishra & Koehler, 2006). The UdL framework was also used to tailor the curriculum to the individual needs, skills, and interests of advanced professional educators. The UbD units developed to provide curriculum maps for each research course clearly complement Goals 1 and 2 and distinctly support the use of applied research and practical theory as central to the development of scholarly practitioners, thus addressing the purpose of this DiP.

Discussion

Local/Organizational Impact

The CEDHP at UCF has been actively engaged in redesigning the Ed.D. in Curriculum and Instruction as a result of becoming a founding member of the CPED consortium in 2007, with the aim of developing a practice-oriented program that fully addresses the needs of advanced professional educators and is clearly differentiated from the traditional Ph.D. program (UCF Graduate Council, 2015). The last documented program revision affecting the research continuum was carried out in 2011, when the current four research courses were adopted (UCF, 2011; UCF Graduate Council, 2015). Thus, the research course sequence curriculum was redesigned using the CPED Working Principles and Design Concepts by redefining research in terms of how it would be used by practitioners to identify, frame, and clearly articulate a complex problem of practice and design innovative solutions to solve it (CPED, 2015c, 2015d).

This design-based study clearly supports and contributes to the Ed.D. in Curriculum and Instruction redesign efforts, as its purpose was to ensure that the research course sequence at UCF supported the use of applied research and practical theory through the use of Inquiry as Practice to provide substantial preparation for advanced professional educators so that they can collect, analyze, and evaluate literature and data to innovatively solve complex problems of practice (Bengston et al., 2014; CPED, 2015c; Perry, 2015). By clarifying the Ed.D. in Curriculum and Instruction program goal and objectives, as well as individual research course learning outcomes, it was possible to develop detailed curriculum alignment matrices to clearly demonstrate how these courses support and align with the use of Inquiry as Practice to ensure that students acquire significant research expertise that can be effectively applied to solve complex problems of practice. Likewise, the creation of individual research course UbD

curriculum maps for the research continuum enabled the identification of additional evidence of how each research course is systematically aligned with the program and addressed any existing gaps and/or redundancies in the curricula. This study visibly allowed for the roles of applied research and practical theory to remain central in the redesign process, as is needed for the development of Ed.D. programs (Shulman et al., 2006).

As noted on the Ed.D. in Curriculum and Instruction first year activity flow chart (Appendix B) , the research courses lead to the first program milestone and juncture, serving as a checkpoint for both faculty and students to ensure the successful application of the applied research skills and concepts needed to address a complex problem of practice and learned during the first year of the program. Hence, the purposeful integration of EDF 7457, *Data*, *Assessment, and Accountability*, as the first course of the research continuum provides students with a better preparation and more opportunities to develop the necessary research skills to perform at the expected level throughout the program.

Having four research courses instead of three also facilitates the development and use of a spiral curriculum, and a progression where the use of Inquiry as Practice and improvement science principles occur in an organic and seamless manner, increasing the levels of complexity as courses advance, and culminating in the direct application of evaluative inquiry to build individual and/or organizational capacity. The proposed Ed.D. in Curriculum and Instruction goal and program objectives and research course instructional objectives and learning outcomes are a direct product of the application of the CPED Working Principles and Design and reflect the different view of the role inquiry plays as a crucial part of the learning process required for the development of scholarly practitioners (Bengston et al., 2014). The clarified UCF Ed.D. in Curriculum and Instruction program goal, objectives, and learning outcomes, together with the

redesigned research course curricula, highlight the distinct and necessary function of the program as one where the role of existing literature is used to solve complex problems of practice rather than following traditional research pursuits of filling gaps in existing knowledge (Belzer & Ryan, 2013; Bengston et al., 2014).

Even though very few research studies address the causes of the problem of practice studied in this DiP, this study also attempted to address the speculated individual and organizational causes of the existing gap between theory and research in the Ed.D. in Curriculum and Instruction research continuum. By using user-centered design principles and developing faculty and student personas to guide the curriculum mapping and design process, this study provides a solution for the cognitive causes identified. Clarifying the overall program goal and objectives, creating curriculum alignment matrices, and developing detailed UbD curriculum maps ensure that both instructors and learners are active participants in the learning process (Baumgartner, 1980), providing sufficient quality knowledge regarding the type of applied data and principles that education practitioners need for faculty members. Similarly, given that at times faculty members who teach the research courses do not come from a culture of schools, or if they do, they may revert to the culture of higher education, the proposed prototypes were purposefully developed to support the practice-based nature of the Ed.D. program and address cultural settings and models that may affect what people think about, what skills they obtain, and the activities they participate in (Gallimore & Goldenberg, 2001; Star & Stylianides, 2013). Support of the practice-based nature of the Ed.D. program was further ensured by applying consistency, flexibility, control, and constraint principles during the curricular redesign process, tailoring the research courses to individual faculty and student needs.

Given that a student's self-efficacy beliefs can be used to predict academic achievement in research courses (Usher & Pajares, 2008), the program goal, objectives, learning outcomes, and curriculum maps were designed to increase motivation and confidence in students. For instance, the integration of improvement science principles, the scaffolding of learning outcomes, the use of productivity tools such as Excel to analyze quantitative data, and the development of authentic assessments throughout the continuum seek to boost self-efficacy in students. Self-efficacy will cause increased motivation and confidence in students while they are enrolled in the research courses resulting in the mastery of learning outcomes and acquisition of desired applied research skills (Usher & Pajares, 2008).

At the organizational level, this study considered the problem of practice from multiple perspectives. Given that organizational culture is both a product and a process that embodies knowledge acquired through experience (Bolman & Deal, 2013), the research courses are seen as symbols of rigor in doctoral programs. Thus, the changes proposed during the curriculum mapping and redesign process thoughtfully considered that any changes made to the research continuum could be perceived as a threat that weakens the perceived rigor of the program. Under this premise, the proposed mixed-methods research courses framed around the use of Inquiry as Practice and improvement science principles, as well as the inclusion of authentic assessments that ask students to directly apply concepts learned in real-life scenarios requiring them to continuously show growth in their learning and the mastery of expected competencies by identifying, analyzing, and evaluating existing problems of practice, seek to support the expected level of rigor that research courses demand of advanced professional educators.

This DiP also dealt with the speculated structural and political causes of the problem. Since the core program and research faculty may be in different administrative units within the

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CEDHP, there can be some potential tensions in terms of protecting territories (Bengston et al., 2014) and some difficulties when requesting any changes to already existing traditional research courses. Hence, the clarification of program objectives and research course curriculum redesign were done to alleviate and solve some of these problems by providing specific outlines and resources for the research courses that can be used by any faculty member to meet the needs of practitioners without major changes.

Last, by integrating improvement science principles into the research continuum curriculum mapping and redesign process to accelerate learning and address complex problems of practice, this study seeks to position the Ed.D. in Curriculum and Instruction program at UCF as one of the leading professional doctorates within the CPED consortium and the country. By means of the application of the CFAT Six Core Principles of Improvement, the research continuum courses offer students the opportunity to study problems in a specific and user-centered manner through anchoring practice improvement in disciplined inquiry and building capacity to design innovative solutions in networked communities (Byrk, 2015; CFAT, 2015). By the incorporation of the latest practice-based research by CFAT, the leading U.S.-based education policy and research center, the Ed.D. in Curriculum and Instruction program at UCF differentiates itself from other CPED member programs and provides advanced professional practitioners the most up-to-date preparation to act as agents of change who epitomize the ultimate Ed.D. in Curriculum and Instruction graduate: a scholarly practitioner who can effectively use applied research skills to solve complex problems of practice and design innovative solutions (CPED, 2015c) in a learning community dedicated to a culture of continuous improvement.

Along the same lines, the integration of education technology and productivity learning outcomes in the research continuum courses offers students a preparation that is consistent with being effective 21st-century global educators (ISTE, 2016). Given that my analysis of the literature and existing professional doctorate programs did not show any other programs including education technology learning outcomes, their inclusion would also position the Ed.D. in Curriculum and Instruction program to be one of the most complete and sophisticated programs for professional practitioners.

Implementation and Evaluation

The clarified Ed.D. in Curriculum and Instruction program goal and objectives, curriculum alignment matrices, and redefined individual research course learning outcomes and curriculum maps were developed to be piloted in the Fall 2016 semester with the sixth program cohort. Given that the research continuum courses span the first two years of the program, faculty members have sufficient time to review the proposed outline, make any necessary modifications, and achieve a full understanding of what students will be learning in the different courses to avoid redundancies and gaps. The provided curriculum alignment matrices (Tables 15–19) can also be used as a resource when developing instructional activities, directions, course materials, and assessments to ensure that the courses are focused on the required mixed-methods approach suitable for education practitioners and to ensure continuity among courses. Research course faculty leads can use the provided prototype to guide in-depth curriculum development for individual course subunits, facilitating the teaching and learning process and the incorporation of new faculty members if needed. Communication and collaboration among faculty members is essential for correct implementation.

Once the prototype products have been implemented, they must be evaluated for value and effectiveness using the UCF Institutional Effectiveness Model, which compares the university to other large metropolitan universities (Smith, 2016). This model follows a holistic approach developed by UCF and has the same foundations as the model for improvement used to redesign the research continuum courses. The assessment process provides sufficient data in a disciplined manner to plan, measure, analyze, and incorporate revisions that will result in the improvement of student performance and learning experience (Smith, 2016). The Institutional Effectiveness model assesses effectiveness at different levels: institution, program, course, and class. Since this study focused on the research continuum courses, it would be beneficial for the core faculty to collectively assess student performance at the program and course levels. Data obtained from this analysis can then inform assessment at the individual class levels, prompting revisions to the overall continuum and individual research courses. In addition, the model also posits 9 Principles of Good Practice for Assessing Student Learning.

My recommendation would be, as previously mentioned, to engage in continuous evaluation at the course level, both during and at the end of the semester, and then collectively to assess the research continuum as a whole yearly and in two-year cycles so that any necessary modifications are addressed in a timely manner for the following cohorts. The assessment should focus on revising learning outcomes and mapping assessments to objective types to collect data and ensure that the program and research course designs are effective and that courses and experiences address all the desired competencies for scholarly practitioners to be successful in their lives and careers (Smith, 2016). Further recommendations about curriculum mapping practices will be discussed in the recommendations section.

National/International Impact

The evolution of Ed.D. programs has been a lesson from long-term experiments at the national and international levels (Rueda et al., 2013). A quick analysis of the Ph.D. and Ed.D. mission statements at top-ranked U.S. universities reveals the many variations of diverging doctoral blueprints that exist across the nation. Nevertheless, it can be asserted that a distinguishing feature of advanced degrees is that context is key, and it is evident that the contexts of education research and practice have evolved to be increasingly dissimilar throughout the years (Maxwell, 1996).

Since this study focused on mapping and redesigning the research continuum curriculum, which is the key differentiating factor of Ed.D. programs, it is evident that it both supports and further contributes to highlighting the distinct need and nature of professional doctorate programs as a practice-based preparation for advanced professional educators (Boud & Tennant, 2006). The professional doctorate brings, then, teaching-learning experience, identity, and textuality to the construct of doctoral education program curricula, which focus on problems of practice (Green, 2012; Ringler & Rouse, 2007).

Comparing the existing Ed.D. in Curriculum and Instruction research course sequence at UCF with those from other Doctor of Education and Professional Doctorate programs from CPED consortium members and other well-known universities (see Appendix C) allowed for an in-depth understanding of the types of research continuums available at other institutions and provided a context for the curricular mapping and redesign carried out during this study. The majority of CPED-affiliated universities offer only three research courses; others, like Johns Hopkins and Virginia Commonwealth, offer only two (JHU, 2015; VCU, 2015), making the Ed.D. in Curriculum and Instruction program at UCF the only CPED consortium member

offering four research courses (UCF, 2015). In terms of renowned universities outside CPED, Vanderbilt University also has a four-course research continuum design for its Ed.D. program (VU, 2015).

Even though some institutions have redesigned their research courses using the Working Principles and Design Concepts proposed by CPED and combining principles of data-based decision making, program evaluation, and action research (Bengston et al., 2014), some others continue to utilize the traditional research courses used in their Ph.D. programs. Further, an initial review of the available research course syllabi of the aforesaid institutions, which are available at the CPED (2015b) website, demonstrates that many of the existing research course sequences do not share the distinctive goal of preparing graduate students to acquire research skills that can be directly used in their professional arenas. This evidence further substantiates the need and value of this design-based study, which provides additional clarification about the direction that Education Doctorate redesign efforts should follow, especially in terms of the research course continuum offered as it defines the role and context of such programs.

The redesign choices, principles, and solutions used throughout this study do not only address the specific need of designing research courses using Inquiry as Practice as a guiding blueprint to ensure the practice-based role that inquiry plays in the preparation of scholarly practitioners (Bengston et al., 2014). They also incorporate the most up-to-date research-based frameworks such as improvement science principles that practitioners need to become positive agents of change. While reviewing existing syllabi and research courses at CPED member institutions, I did not find any others that have purposefully espoused CPED Working Principles and Design Concepts with the principles of improvement science advocated by the CFAT. Thus, this study provides a new personalized research continuum model based on the use of not only

systematic and systemic inquiry (CPED, 2015d), but also disciplined evaluative inquiry tailored

to individual faculty backgrounds and student needs through the amalgamation of user-centered

principles (Lidwell et al., 2010), backward design (Wiggins & McTighe, 2005), the spiral

curriculum (Bruner, 1960) and cognitive apprenticeship models (Brown et al., 1989),

quantitative and qualitative reasoning theories (Shaughnessy, 2003) and the use of measurable

learning outcomes developed using Anderson and Krathwohl's (2001) Revised Bloom's

Taxonomy.

This model is aligned and supported by the presented curriculum alignment matrices

(Allen, 2004; Jacobs, 2004; Maki, 2004), which provide a dynamic document of the existing

research course curriculum, with the Signature Pedagogy of Inquiry as Practice and

Improvement Science principles for continuous improvement in education arenas (CPED, 2015c;

Langley et al., 2009), allowing for constant revisions and updates as needed. Therefore, it is the

hope of this designer that the developed prototype Ed.D. in Curriculum and Instruction program

goal, objectives, research course curriculum maps, and alignment matrices can be used as a

foundation both enhanced and enriched by the core faculty to continue future redesign efforts, to

be used to maintain the position of the CEDHP at UCF as a leading CPED consortium member,

and to maintain the Ed.D. in Curriculum and Instruction program as a leader across the nation in

providing the best preparation for advanced professional educators to solve complex problems of

practice.

One cannot avoid discussing the impact of the research continuum courses on Ed.D.

programs' summative evaluation. Most professional doctorate programs require students to carry

out a capstone project, which in most cases is referred to as an applied dissertation or DiP. The

capstone project requires students to demonstrate mastery of the program's competencies by

applying the knowledge and skills acquired throughout the program by focusing on a current

problem of professional practice at school districts, colleges, or other educational institutions or

branches. Although the overall goal of any Ed.D. program research courses is to prepare students

to apply research skills to solve complex problems of practice and design innovative solutions

for continuous improvement beyond the scope of the program, it can also be argued that the

research courses play a critical role in preparing students to successfully complete their capstone

projects. As such, this study also supports the desired preparation for students to successfully

address a problem of practice of their choice, as the proposed redesigned research continuum

courses offer preparation in mixed methods, as well as many opportunities for students to

understand and master the different types of action research that they would be performing. The

last two courses of the continuum were framed around the proposed authentic assessments, to

give students practice with both design-based and evaluation-based studies in preparation for

their DiP. As previously stated, this is also a differentiating factor of the Ed.D. in Curriculum and

Instruction program at UCF, as my literature and course syllabi review did not return existing

research courses at CPED institutions that focus on design-based research studies for continuous

improvement, as the proposed redesigned curriculum map (see Tables 26, 27, and 28) for the

third research course does. Finally, this study did not focus on international Ed.D. programs,

since although they have also undergone several redesign efforts, their history and

conceptualization show diverging evolutionary pathways with respect to the national one.

<div align="center">Positionality and Lessons Learned</div>

Defining a researcher's positionality is important to all kinds of research; however,

defining that positionality is unique for action researchers as they share a relationship with the

setting and participants, and also because their positionality, as outsider or insider, could change throughout the research process (Herr & Anderson, 2015). Given that I am a current Ed.D. in Curriculum and Instruction doctoral candidate at UCF, that I have first-hand experience of the program's research continuum as a student, and that this design-based study focused on studying the existing research course sequence of the program in terms of the preparation it provides for advanced professional educators, it can be stated that as a practitioner researcher, my positionality is that of an insider researcher (Herr & Anderson, 2015). Nevertheless, in my capacity as a student I depended on the support, knowledge, and experience of existing core faculty members to provide existing course data, as well as for guidance throughout the design process, thus ensuring a high-quality product, a more democratic process, and a greater impact on the setting (Herr & Anderson, 2015). It follows then, that my positionality could be perhaps best located in the Continuum of Positionality in Action Research developed by Herr and Anderson (2015) as an insider in collaboration with other insiders.

Having the opportunity to experience the role of an insider researcher working in collaboration with highly experienced and knowledgeable insiders has allowed me to learn several lessons throughout the development of this design-based study, as well as to increase my self-efficacy and grow as a researcher, curriculum designer, and practitioner. Even though I have collaborated with teachers and led several K-12 curriculum redesign efforts throughout my professional career, the experience of working in a higher education setting and collaborating with more knowledgeable educators has been the most enlightening and enriching experience to date. I have learned the importance of selecting the most up-to-date and innovative curriculum design frameworks, models, and principles grounded in both theoretical and practical research to guide the redesign process. The thoughtful selection of these solutions is imperative to

developing a high-quality and valid product that reflects the mission and vision of the institution, college, and program.

Although all the design choices used in this study have provided greater insight as to the development of curricula, the use of user-centered design principles has been one of the most valuable additions to my design toolbox. In the past, I had not purposefully considered the different readiness levels or backgrounds of both course instructors and students when redesigning an existing curriculum; however, through the development of faculty and student personas and the use of principles such as constraint, control, and flexibility, I can better tailor any curricular needs to specific audience groups. Likewise, I have also learned how curriculum materials can be developed with the intent to promote both teacher learning and student learning (Davis & Krajcik, 2005).

In terms of course contents, this study has not also helped me refine and completely master all concepts learned in the research continuum courses but acquire in-depth knowledge of mixed methods for practitioners as I researched the most current learning and teaching practices. For instance, I am now familiar with statistical reasoning theories, cognitive apprenticeship models, and their implication in practice. This knowledge has showed me that courses should be developed taking into consideration cognitive and reasoning theories that are specific to the teaching and learning of individual subject matters, selecting the most suitable pedagogies and assessments to ensure student success (Brown et al., 1989; Shaughnessy, 2003).

Another lesson learned has been the use of backward design, not only to develop course curriculum maps or units but also to develop overall program goals and objectives based on an institution's mission and vision (UCONN, 2015). Clarifying the Ed.D. in Curriculum and Instruction program goal and objectives required active collaboration, in-depth knowledge of the

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mission of the program, and the program's influencing principles. By designing curriculums with the end in mind, it is possible to ensure that students understand and attain instructional objectives and learning outcomes (Wiggins & McTighe, 2005). Similarly, developing learning outcomes taking into consideration the knowledge and cognitive process dimension helps clearly scaffold contents for students and differentiate instruction according to students' individual needs and backgrounds in agreement with the predetermined personas (Center for Applied Special Technology (CAST), 2012; Pratt, 1994; Wigging & McTighe, 2005). I have learned to create authentic assessments that are a true reflection of the core tenets of this program, providing advanced professional educators with opportunities to practice using relevant and real data, and I understand the importance of making data-driven decisions about the best solutions to complex problems of practice.

Much was also learned from the CPED initiative, its website, Working Principles and Design Concepts. Using these CPED guidelines has been very informative and has allowed me to attain an in-depth understanding of the professional practice program. Carrying out this study has helped me understand and contribute to the unique role and need of Education Doctorate programs and to clearly differentiate them from traditional research-based programs. Researching the existing Ed.D. and other professional doctorate programs has shown me how to consider problems of practice from a global perspective and to search for solutions at both the local and international levels. Along the same lines, one of the biggest lessons was to acquire knowledge and understanding about improvement science and how to use and apply the Model for Improvement in practice to validate that an implemented change actually results in a desired improvement (Langley et al., 2009). As a practitioner, I have implemented several changes, but I

had not purposefully made use of disciplined inquiry to systematically evaluate whether the change I implemented was indeed positive.

The collaboration piece has also been of utmost importance. I have become a better listener by considering each core faculty member's point of view about his or her own course, the research continuum, and the program, and including all of their collective vision throughout the redesign process. Also, I had the opportunity to clearly communicate with faculty members as I redesigned individual course assessments and rubrics and explained my vision and rationale behind the new designs. Thus, this study has also allowed me the opportunity to serve as a curriculum reviewer and improve upon my leadership skills.

In essence, not only has this study required me to apply all the concepts and skills learned throughout every course in the program, but it has also constantly required me to think critically, reflect metacognitively, articulate ideas clearly, respect and value different points of view, and communicate in a professional manner, and it reinforced my believe that challenges are opportunities for betterment and taking calculated risks is important. I feel this program and study have provided me with exceptional preparation to successfully practice in any K-20 environment and in any capacity. I look forward to applying everything I have learned as I begin my new role as a school leader in charge of preparing other educators in best teaching and learning practices and the curricular redesign process through the use of inquiry to ensure a culture of continuous improvement.

Limitations

As with any research studies, there are limitations that should be taken into consideration. Despite the fact that I was able to successfully address the three goals set for this DiP, time did

not allow for the complete development of each research course subunit. Given a longer period of time to develop this study, I would have developed in-detail instructional strategies, accommodations, materials, and assessments for each research course as was the case for the quantitative subunit (Appendix E) developed for EDF 7478. However, it can be argued that by my developing only research course UbD curriculum maps (Tables 20–31), faculty members can revise and enhance each course according to their professional judgment and preference and depending on their level of expertise and knowledge. This possibility for revision and enhancement would also allow faculty members to still be able to fully develop their own course either individually or in collaboration with other faculty members, using their academic freedom.

Along the same lines, this study focused solely on the mapping and redesign of the four courses in the research continuum of the program, yet it would be important also to analyze how the program goal and objectives are further supported by the DiP courses that students take during the last year of the program, as they are a direct application of the knowledge and skills learned in the research course sequence.

The most significant limitation due to time constraints is the fact that the actual causes of the problem of practice being addressed in this study were not fully investigated. As previously highlighted, there are very few research studies investigating the speculated causes stated in this study. While Bengston et al.'s (2014) White Paper does provide some support of these speculated causes, corroborating the need for the curriculum mapping and redesign of the Ed.D. in Curriculum and Instruction research continuum at UCF, it is evident that this existing gap warrants further research to bridge theory and practice.

The time available for this study also impacted the amount of collaboration that could occur with all core faculty members, and thus affected the carrying out of detailed revisions of

the prototypes before the actual defense. Still, I was able to have multiple collaborations with Dr. Boote, Dissertation Chair, and core faculty for two of the four research courses during our scheduled weekly or bi-weekly meetings, as well as with Dr. Swan, especially in the months of January to April of 2016. These collaborations were very insightful and extremely helpful to the development of this study. Continuous collaboration with Dr. Hopp was more challenging due to her extremely busy schedule and availability; nevertheless, she was always extremely supportive and cooperative during our collaboration sessions.

Since this study situated the problem of practice at the local and national levels, it would also be useful to expand the study to include international Ed.D. programs, which share the same redesign evolutionary pathway as the national ones, as these continue to increase in number (Neumann, 2005). This study also related the problem primarily to other CPED-influenced institutions as a founding CPED member. This limitation could perhaps be addressed by comparing the redesigned prototypes more broadly to other highly valued programs from non-CPED institutions.

It is also important to acknowledge that my capacity as an inside researcher could present a potential for bias in the study. While this study was carried out in an objective manner and with insider collaboration to prevent bias, it is still possible that my personal experience and program perceptions could have influenced the curriculum redesign process.

Last, due to the length and cohort format of the program, the proposed prototypes have not yet been fully implemented or evaluated for effectiveness, posing yet another limitation. It is important to support the effectiveness or shortcomings of the presented products through the suggested evaluation models and make decisions based on the resulting data.

Implications for Practice

This study was carried out based on the need of continuing redesign efforts to ensure that the Ed.D. in Curriculum and Instruction research continuum successfully prepares scholarly practitioners to "gather, organize, judge, aggregate, and analyze situations, literature, and data with a critical lens" (CPED, 2015c, para. 4) and understand the effects of innovation (CPED, 2015d). The redefinition of the research continuum as four courses instead of three provides a well-defined learning pathway for students throughout the program. Likewise, it also facilitates the evaluation of individual student progress during the first two years, as the research continuum is closely related to each end-of-year milestone.

The clarified program goal and objectives, curriculum alignment matrices, and individual research course curriculum maps provide a strong and systematically aligned foundation for core faculty members to fully develop the courses and ensure the proposed practitioner-based continuum focus. Having professional conversations and collaborating throughout the process will provide an in-depth understanding of the spiral curriculum model used, while clearly defining each course's boundaries and prerequisites, thus making the program stronger and ensuring student success. Discussions about instructional strategies, approaches, and authentic assessments used to frame their individual courses will also promote cohesiveness in the continuum, avoiding the creation of redundancies or gaps along the curriculum.

Since the curriculum mapping and redesign process was guided primarily by CPED Working Principles, especially 4 and 5, as well as Inquiry and Practice and improvement science principles, it is critical to ensure that all faculty members teaching and/or developing those courses be familiar with these frameworks and understand their roles in preparing advanced professional educators to solve complex problems of practice. Also, all research continuum

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instructors should thoroughly understand the role of the Ed.D. in Curriculum and Instruction as a practitioner-based program and appreciate how the identity is determined by the applied nature of the research continuum.

Ideally, faculty members use the provided curriculum alignment matrices to guide their instruction, as they follow how each learning outcome seeks to support the program objectives at the basic, intermediate, and advanced expectation levels. Along the same lines, it is essential that faculty members adapt the provided prototypes and proposed personas to the changing needs of cohorts, as these all come from different backgrounds and have a direct impact on their research preparation, especially in terms of quantitative data knowledge. Other proposed principles like differentiation strategies using UdL and prioritization of learning outcomes (Pratt, 1994) should assist the curriculum adaptation process.

Ideally, the proposed prototype program goal, objectives, alignment matrices, and curriculum maps address the speculated causes of the problem since, clearly, the effectiveness of the redesigned curriculum will also depend on these factors. Having faculty members with both practitioner and higher education backgrounds would be highly beneficial to the preparation of scholarly practitioners and to maintaining the practitioner-based nature of the program.

As formerly mentioned, best teaching and learning practices mandate the assessment of the proposed prototypes. Hence, as suggested earlier, the effectiveness of this study's products should be evaluated using the 9 Principles of Good Practice for Assessing Student Learning (Smith, 2016) at the program, course, and individual class level. As also advised, individual instructors could also evaluate their courses or units using Langley et al.'s (2009) Model for Improvement as the blueprint for the third research course, gain first-hand experience and data to use in their courses, and relate to the spiral curriculum requirements. Results should be used to

revise the research continuum and redesign it according to the needs and design choices selected. Last, given that it could be argued that the CPED Working Principles and Design Concepts definitions are ambiguous, it is important to share a collective view of these definitions. Having a research continuum faculty lead member will provide consistency, as well as ensure that the courses developed and materials used are in congruency with the program's mission and goal.

<u>Recommendations</u>

Uchiyama and Radin (2009) postulated that the process of curriculum mapping is a cyclical process that consists of five distinct stages: individual faculty members develop maps of their courses throughout the semester as they teach it; faculty members who teach the same course aggregate their maps; and all faculty members involved in the same sequence or program collectively review these maps, identify areas in need of alignment, redundancies, or gaps, and develop/implement a plan to address areas the areas of need.

Though this study followed these recommended steps while creating the presented curriculum alignment matrices, it was not carried out in collaboration with all faculty members. Consequently, the first recommendation is to engage in continuous and routine curriculum mapping practices for the research continuum courses, including all respective faculty members. Since the research continuum spans a two-year period, a two-year time period is suggested for revising, developing, and aligning the research courses. This suggestion would not only increase collegiality and collaboration (Uchiyama & Radin, 2009) but also promote the aforesaid professional conversations as well as professional development to ensure that the research continuum courses preserve their applied nature and that all faculty members have complete knowledge and awareness of the sequence.

Since curriculum mapping is a real-time and visual process (Jacobs, 2004; Uchiyama & Radin, 2009), I recommend the use of the giant-grid method using markers and giant post-its (University of Hawaii-Manoa, 2013) to develop overall course and sequence alignment matrices like the ones presented in this study, so that the entire faculty team can participate and visualize the process. After this is accomplished, electronic versions of the matrices should be produced to ensure documentation, longevity, and easy access to all. This alignment method should further support the annual curriculum evaluations carried out using the UCF Institutional Effectiveness model and be revised accordingly. Moreover, evaluations carried out by the faculty or possibly by another student for his or her DiP should also focus on measuring the medium and long-term outcomes identified in the logic model of the program (Appendix A).

The inclusion of education technology learning outcomes into the research courses requires the availability of resources and support for the research continuum faculty members if needed. Even though this may require additional preparation, which can be added to the curriculum as an educative curriculum component (Davis & Krajcik, 2005), a second recommendation would be to perhaps include overall education technology objectives for the Ed.D. in Curriculum and Instruction program. This addition would not only differentiate the UCF program from those of other institutions as one that purposefully includes digital literacy and citizenship for all students regardless of their area of concentration and prepares scholarly practitioners to become 21st-century global educators, but it would also allow for a more personalized curriculum (Grant & Basye, 2014) and prompt the development of more innovative assessments and the organic integration of technology into the curriculum. Although there are several technology integration models, this study suggests the use of the TPACK framework (Mishra & Koehler, 2006) and the Assure Model (Smaldino et al., 2009) for lesson development.

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In order to provide students with even more real-life learning experiences, the authentic assessments proposed in the UbD curriculum maps (Tables 20–31), could be modified to include partnerships with learning institutions or organizations within UCF to immerse students in the context of different practices and analyze existing data using the mixed methods approaches learned in the research courses. While the need of IRB approval forms may be a deterrent to include these types of experiences due to time constraints, it is important to remember that students do not require an IRB to participate in these experiences as long as they are not publishing their work. Under these circumstances, the benefit and learning that comes from the exposure to the real-world scenario is more important than undergoing the IRB process, as students will already experience that twice while carrying out their gap analysis projects.

Another recommendation would be to perhaps revise the research continuum course denominations, to better reflect the incorporation of EDF 7457 into the research sequence and to highlight the applied role of inquiry in the preparation of professional practitioners. For instance, we currently refer to these inquiry-based mixed methods courses as the research course sequence; yet, this may be in contradiction with the applied research nature of the Ed.D. in Curriculum and Instruction program and perpetuate Shulman et al.'s (2006) idea of the program being Ph.D.- lite, rather than an equally rigorous preparation for practitioners.

A final note to remember is that although the research continuum prepares students to effectively solve problems of practice beyond the scope of the program, the research courses as well as the other core courses should be clearly bridged to the capstone project throughout the program. Consequently, it would also be my recommendation to extend the study to include both EDF 7985, Proposing and Implementing Data-Driven Decisions, and EDF 7987, Dissertation in Practice, into the curriculum mapping process to gain a better understanding of how the learning

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outcomes in these courses further produce and support the Ed.D. in Curriculum and Instruction program goal and objectives, as well the impact of the research continuum courses in successfully preparing students for their capstone experience. Given their close relationship and interdependence, it could also be argued that EDF 7985 and EDF 7987 belong to the program's research course sequence, as these represent the summative experiences in the continuum and should be studied simultaneously.

Summary

Given that Inquiry as Practice preparation relies on the ability of advanced professional educators to collect, analyze, and evaluate literature and data to innovatively solve complex problems of practice (CPED, 2015c), the purpose of this Dissertation in Practice was to ensure that the Ed.D. in Curriculum and Instruction research continuum at UCF supports the use of applied research and practical theory as central to the development of scholarly practitioners. This study fulfilled its purpose by addressing three main goals: clarifying program goals, objectives, and research continuum learning outcomes; developing research course sequence alignment matrices and curriculum maps.

The curriculum mapping and redesign process was supported by research-based design choices in alignment with the practice-oriented nature of the program. These design choices included the CPED (2015a) Working Principles and Design Concepts, particularly the use of Inquiry as Practice as the main redesign framework espoused with improvement science principles (Langley et al., 2009) as advocated by CFAT in its capacity as a leading education research institutions. These frameworks were first used as foundations to clarify the Ed.D. in Curriculum and Instruction program goal and overall objectives. Once this was accomplished,

user-centered design principles were applied to create faculty and student personas, which together with the clarified program objectives would inform the redefinition of individual research course learning outcomes using Anderson and Krathwohl's (2001) Revised Bloom's Taxonomy. These learning outcomes were then used to create curriculum maps by using alignment matrices showing where they produced each of the program objectives at the basic, intermediate, and advanced expectation levels. This iterative process was carried out simultaneously with the research course curriculum map unit redesign for each of the research continuum courses using backward design principles (Wigging & McTighe, 2005) and a spiral curriculum model (Bruner, 1960; Harden & Stamper, 1999). Some of the proposed course units were developed in detail to further demonstrate the application of differentiating strategies such as UdL principles (CAST, 2012), and the prioritization of learning outcomes (Pratt, 1994). In addition, course contents were selected based on cognitive and reasoning learning theories pertaining to mixed method courses (Brown et al., 1989; Shaughnessy, 2003). The resulting prototypes presented in this study represent the successful attainment of said goals.

At the organization level, this study seeks to further support the continuous Ed.D. in Curriculum and Instruction curriculum redesign efforts that the CEDHP at UCF has carried out since the inception of the program in 1982 and also to clearly distinguish the Education Doctorate program from traditional research-based doctorates as a rigorous and necessary program for the preparation of advanced professional educators. Likewise, this study seeks to further support the continuous Ed.D. in Curriculum and Instruction curriculum redesign efforts by redefining the research continuum as a sequence of four courses instead of three, provide ample opportunities for graduate students to master the expected competencies, and become positive agents of change at their professional practices. The use of improvement science

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principles and the effective integration of education technology following the recommended TPACK framework (Mishra & Koehler, 2006) to innovate the existing research course continuum also seeks to reaffirm UCF's position as a leading CPED consortium member and differentiate the program from those offered in other institutions as a highly competitive and rigorous program.

It is my hope that this study will serve as a solid research continuum foundation that the program's core faculty can further develop, enhance, and improve with the aim of providing the following cohorts the best possible applied research preparation to effectively solve complex problems of practice and design the most suitable research-based innovative solutions. At the national level, it is also my hope that other CPED-influenced professional practice programs benefit from this study as they consider the careful redesign of their research or inquiry sequences to define their programs as ones that fully address the needs of advanced professional practitioners and completely differentiate them from the traditional Ph.D. program.

Last, it is imperative to assess the effectiveness of these prototypes by using the university's Institutional Effectiveness Model (Smith, 2016), as well as the recommended best curriculum development methods (University of Hawaii-Manoa, 2013) and individual class evaluation approaches using the Model for Improvement (Langley et al., 2014). The limitations identified should guide the improvement of this study for future revisions, as do the recommendations suggested for future research studies. These include extending this study's focus to identifying the motivational, cognitive, and organizational causes of the problem, including the third-year courses as part of the research continuum into the mapping and redesign process, developing the curriculum units in greater detail, and implementing and evaluating the prototypes developed to ensure their effectiveness in preparing scholarly practitioners to act as
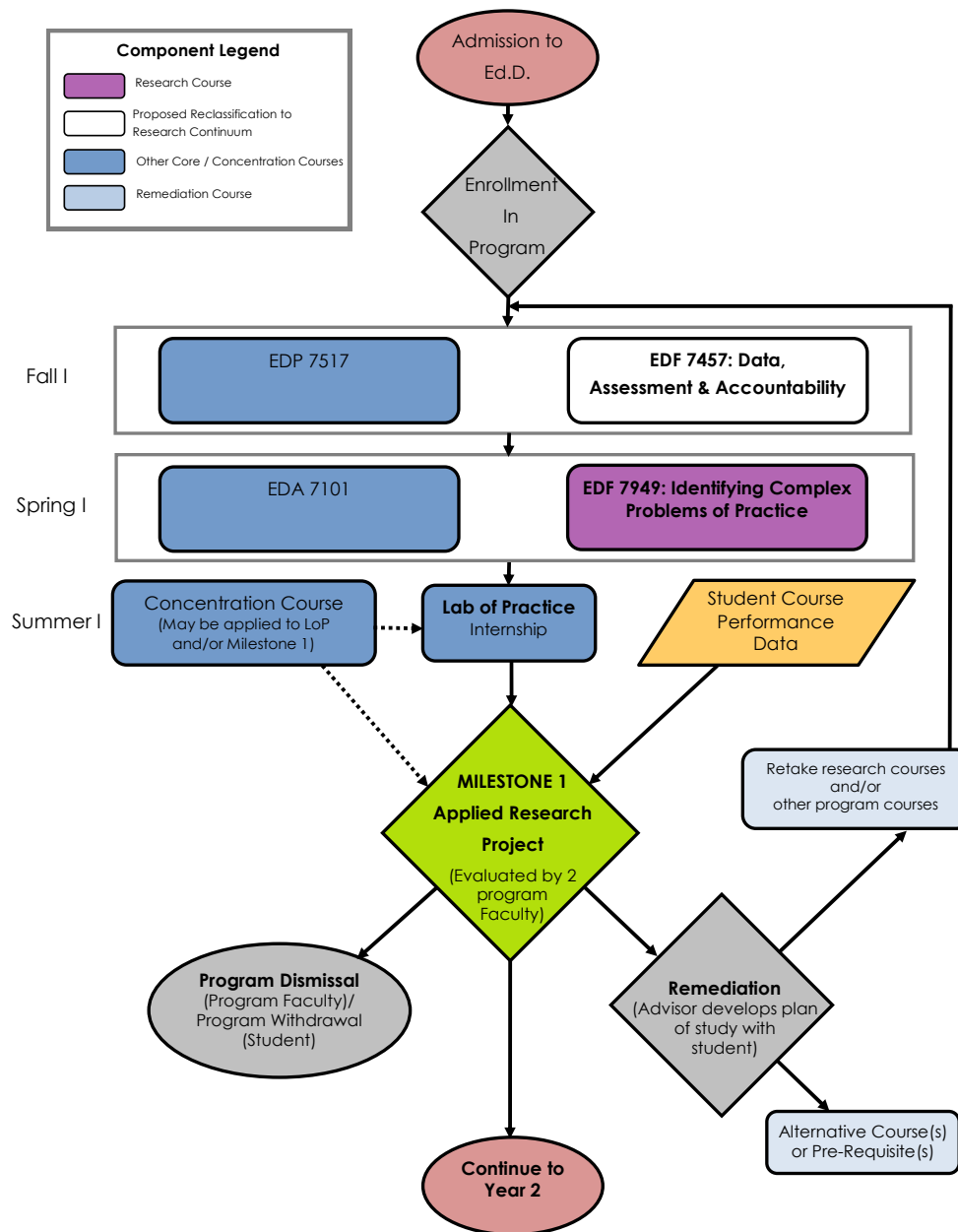
agents of change at their practices and to validate the expected short, medium, and long-term

outcomes of the program.

APPENDIX A: LOGIC MODEL

Logic model for the sequence of research courses for the professional doctorate in curriculum and instruction (Ed.D.) at UCF

Inputs	Strategies	Output	Outcomes		Long-term Goals (Outcomes)
			Short-Term	Medium-Term	
◆ Full-time Ed.D. Faculty ◆ Ed.D. Students ◆ Ed.D. Program of Study Research Courses suitable for professional practice ◆ Classrooms ◆ Budget/funding ◆ Resources ◆ Technology/IT Personnel	◆ Ed.D. students continue to be admitted as cohorts ◆ Clear benchmarks for research courses and curriculum mapping ◆ Develop course syllabi for research courses clearly aligned with program benchmarks for professional practice for each fall/spring semester ◆ Labs of Practice at the end of each year as opportunities to apply research skills learned. ◆ Continuous Professional Development and Collaboration among Ed.D. Faculty ◆ Recruit qualified and experienced professors	◆ Ed.D. Program of Study with appropriate sequence of research courses grounded in professional practice needs ◆ Students acquire and use research courses skills to study complex problems of practice in K-16 education (program evaluations, program models, action research, policy analyses, etc.)	◆ Students feel more efficacious about the research skills acquired and see the value of them. ◆ Students acquire substantial research expertise and apply it to their professional practice (day-to-day jobs) ◆ Students show increased knowledge of using data to support decision-making processed. ◆ Ed.D. produce a high quality Captsone Project/Alternative Summative Assessment that addresses a complex problem of practice applying skills learned	◆ Increased number of Ed.D. applicants ◆ Increased awareness of need for research skills as a key component of Ed.D. program and preparation for professional practice. ◆ Graduates will obtain leadership positions based on their use of research skills (data) to make institutional decisions that impact learning and instruction	◆ Graduates will have a positive impact in student achievement in their learning institutions. ◆ Graduates will impact quality of instruction at their institutions. ◆ Impact: Measuring success of program through promotions, publications, models developed, enrollment etc. ◆ Research course program of study used by or aligned with CPED goals and other institution offerings

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APPENDIX B: UCF ED.D. IN CURRICULUM AND INSTRUCTION FIRST-YEAR PROGRAM FLOW CHART

Component Legend

- Research Course
- Proposed Reclassification to Research Continuum
- Other Core / Concentration Courses
- Remediation Course

Admission to Ed.D.

Enrollment In Program

Fall I
- EDP 7517
- **EDF 7457: Data, Assessment & Accountability**

Spring I
- EDA 7101
- **EDF 7949: Identifying Complex Problems of Practice**

Summer I
- Concentration Course (May be applied to LoP and/or Milestone 1)
- **Lab of Practice** Internship
- Student Course Performance Data

MILESTONE 1 Applied Research Project (Evaluated by 2 program Faculty)

Retake research courses and/or other program courses

Program Dismissal (Program Faculty)/ Program Withdrawal (Student)

Remediation (Advisor develops plan of study with student)

Alternative Course(s) or Pre-Requisite(s)

Continue to Year 2

This figure illustrates the current research course components for the first year of the program and their connections as well as influence on the rest of the coursework and the Milestone I project.

APPENDIX C: COMPARISON OF DOCTOR OF EDUCATION AND OTHER PROFESSIONAL DOCTORATE PROGRAMS

University/ Program	Duration of Program/Design	Research Courses Offered	Milestones/ Capstone Project
University of Central Florida – Doctor of Education (Ed.D.) in Curriculum and Instruction (UCF CEDHP, 2015).	♦ Students admitted in cohorts ♦ 9 Semesters (3 Years)	♦ Data, Assessment & Accountability (Fall 1) ♦ Identifying Complex Problems of Practice (Spring I) ♦ Analysis of Complex Problems of Practice (Fall II) ♦ Evaluation of Complex Problems of Practice (Spring III)	♦ Lab of Practice (Summers I and II) ♦ Milestone I: Case Study/Gap Analysis Project ♦ Milestone II: Problem of Practice Poster Presentation ♦ Milestone III/Capstone Project: Dissertation in Practice (Fall/Spring III) & Defense (Summer III)
Virginia Polytechnic Institute and State University (Virginia Tech) – Doctor of Education (Ed.D.) in Curriculum & Instruction (VT, 2015).	♦ Students admitted in cohorts and receive individual plan of study based on their previous experience and research interests ♦ 9 Semesters (3 Years)	♦ Quantitative Research Methods in Education I & II ♦ Field Studies in Education	♦ Capstone Project: Dissertation – Action Research

University/ Program	Duration of Program/Design	Research Courses Offered	Milestones/ Capstone Project
University of Vanderbilt – Doctor of Education (Ed.D.)in Educational Leadership & Curriculum Policy (Vanderbilt University, 2015).	♦ Students admitted in cohorts ♦ 9 Semesters (3 Years)	♦ Decision Analysis I: Logic of Systematic Inquiry (Spring I) ♦ Decision Analysis II: Quantitative Analysis (Summer II) ♦ Decision Analysis III: Qualitative Analysis (Fall II) ♦ Decision Analysis IV: Education Policy and Program Evaluation (Summer III)	♦ Capstone Project: individual research embedded within group developed by external partners.
Arizona State University – Doctor of Education (Ed.D.) in Leadership and Innovation (ASU, 2015).	♦ Students admitted in cohorts ♦ 9 Semesters (3 years)	♦ Strategies for Inquiry ♦ Mixed Methods of Inquiry ♦ Applied Mixed Methods of Inquiry	♦ Capstone Project: Dissertation with practice applications (traditional format)
Virginia Commonwealth University– Doctor of Education (Ed.D.) in Leadership (VCU, 2013-2015).	♦ Students admitted in cohorts ♦ 9 Semesters (3 years)	♦ Evidence Informed Perspective on Practice I ♦ Evidence Informed Perspective on Practice II	♦ Formative Assessments (Spring I and II) ♦ Capstone Project (Year 3)
Johns Hopkins University – Ed.D. (JHU, 2015).	♦ 9 Semesters (3 years)	♦ Research Methods and Systematic Inquiry I (Spring I) ♦ Research Methods and Systematic Inquiry II (Fall II)	♦ Applied research project/dissertation (Summer I, II and III) (culmination of three independently completed but closely interrelated projects embedded throughout coursework).

University/ Program	Duration of Program/Design	Research Courses Offered	Milestones/ Capstone Project
William & Mary – Executive Doctor fo Eduation (Ed.D.) in K-12 Administration (William and Mary, 2015).	♦ 7 Semesters (3 years) ♦ Cohort Based	♦ Inquiry I: Data-Based Decision Making (Summer I) ♦ Inquiry II: Action Research (Fall I) ♦ Inquiry III: Program Evaluation (Spring I)	♦ Capstone Project: Dissertation Defense (Fall III)
Biola University – Doctor of Ministry (DMin) (Biola University, 1996-2015).	♦ Cohort Based ♦ 3 Years for residencies and up to 3 years more for Capstone Project	♦ Residency I (Year 1) ♦ Residency II (Year 2) ♦ Residency III (Year 3) (The whole program is based on Residencies, preparations for them and post-residency projects)	♦ Capstone Project: Doctoral Project
Georgetown University - Doctor of Nursing Practice (DNP) (GU, 2015).	♦ 7 Semesters	♦ Translational Research I (Semester III) ♦ Translational Research II (Semester V) ♦ Translational Research III (Semester VII)	♦ DNP Translational Research Project (End of Semester VII) – translate evidence from original research and accelerate the adoption of best clinical practices. ♦ Practical courses are taught by the Department of Health Systems Administration

APPENDIX D: CURRICULUM MAP INFORMATION SHEET

Curriculum Map Information Sheet For Research Courses

(Adapted from Jacobs, 2004)

Part 1

This template will be completed for each research course map.

Department: _____   Date: _____

Course: _____   Instructor: _____

Standard Template for Initial/Existing Curriculum Maps				
	January/ August	**February/ September**	**March/ October**	**April/ November**	**May/ December**
Content				
Skill/Learning Objective(s)				
Formative Assessment				
Summative Assessment				
Essential Questions/ Other				

Part 2

Course	Possible Gaps Noted	Possible Repetitions/Redundancies
EDF 7457: Data, Assessment and Accountability		
EDF 7494: Identifying Complex Problems of Practice		
EDF 7478: Analysis of Data for Complex Problems of Practice		
EDF 7468: Evaluation of Complex Problems of Practice		

APPENDIX E: UBD CURRICULUM OVERVIEW FOR EDF 7478 QUANTITATIVE UNIT

This is the fourth unit in the course, corresponding to learning outcome 4.1, as detailed in the EDF 7478 curriculum map in Tables 26-28.

Stage 1 – Desired Results

Established Goals:

Ed.D. Program Goal: Ed.D. in Curriculum and Instruction research courses will prepare scholarly practitioners to critically examine complex problems of educational practice in context through the use of Inquiry as Practice with the aim of designing innovative solutions that will effect positive change.

Unit Instructional Objective*:* Ed.D. in Curriculum and Instruction students acquire substantial research expertise and apply it to their professional practice.

➢ *Students will be able to independently use their learning to:*
- o Use applied quantitative analysis to identify, analyze and evaluate a complex problem of practice at their professional organizations that support decision-making.
- o Use applied research skills to interpret results from published quantitative research and critique the quantitative methods used therein.

Understandings:	Essential Questions:
Students will understand that…(big idea)	
 • Quantitative data analysis can be seen as comparisons (correlations) or differences according to different levels of measurement that describe the relationships among data values.	• What is the best way to represent quantitative data? • How can we use excel to represent different types of data? • How can we best describe quantitative data? • How can we use Excel to calculate these measures for us? • How is statistical tendency used? • What leads to the Normal Distribution? • How does the use of statistics help identify, analyze and evaluate a complex problem of practice?

Stage 1 – Desired Results	

Students will know… (K)
 	
 1. Data Representation (Excel)
     • Different types of variables and scales of measurement.
     • How to create tabular displays.
     • How to create graphical displays for one and two variables:
        ○ Categorical Data (bar graphs, pie charts)
        ○ Numerical Data (histogram, scatterplot, linear regression/best-fit line)
     • Percentiles (boxplot)
 2. Population Parameters
     • Univariate and bivariate: use Excel to calculate measures of central tendency, dispersion, tests of significance for parametric and non-parametric data and Pearson's correlation coefficient.
     • Interpretation of Spearman's Rho, tests of significance and variance (ANOVA, ANCOVA, and MANOVA).
 3. Normal Distribution
     • Describe the Normal Distribution.
 4. Statistics and Educational Research
     • How to apply the learned quantitative skills to interpret and critique published research.
 5. *Extension (Differentiation)*:
     • Perform further statistical tests using Excel and/or other software such as SPSS.
	Students will be able to (learning outcomes)… (S)
	
	 1.1 Differentiate between the different types of variables and scales of measurement.
	 1.2 Construct suitable graphical summaries of data using Excel (categorical, numerical, and percentiles).
	 1.3 Use Excel (effectively) to (analyze and) interpret graphical displays data.
	 1.4 Describe graphically and numerically the relations between two quantitative variables.
	 2.1 Produce numerical summary statistics using Excel (measures of central tendency, dispersion).
	 2.2 Explain which data summaries are suitable for which type of data.
	 2.3 Interpret statistical tests of significance and variance.
	 2.4 Use measures of central tendency and dispersion to describe data.
	
	 3.1 Understand properties of the normal curve.
	 3.2 Describe the impact of skewness statistics.
	 4.1 Interpret results from existing quantitative research within an empirical (and theoretical?) context.
	 4.2 Value the applicability of quantitative research to practice.
	 4.3 Feel more efficacious about the research skills acquired.
	 4.4 Critique quantitative methods used in existing research.
	
	 Extension
	 5.1 Interpret further statistics used in social and behavioral studies.
	 5.2 Use Excel (and/or other software such as SPSS) to perform further statistical tests.

Stage 2 – Assessment Evidence	
Performance Tasks: (T)	**Other Evidence: (OE)**

• *Authentic (Summative) Assessment*: This culminating performance task has been designed to assess all course units, however, we will focus on the quantitative section of the project for this assignment. The instructor will look for demonstration of both conceptual and procedural knowledge aligned with corresponding objective.
   o Students will work in groups and will be paired with field mentors from learning organizations to experience the applied nature of this quantitative course while being involved in authentic data-driven analysis. This culminating performance task will be used to assess all course units, however, we would focus on the quantitative section of the project (1.1-1.4, 2.1-2.4, 3.1-3.2, possibly 5.1,5.2). It would also serve as part of the "service" component of the program. The final product would be a report (GAP analysis?) for the mentor (organization) and instructor, and also, the team will share a summary of the results with the class, faculty and organization mentors and leaders (these could be invited as a special event).
 	
*Note: the authentic assessment (together with unit 5) will also provide an experiential introduction (experiential objective) to program evaluation and sharing of results as a bridge for the following research course.
 	
Evaluative Criteria
• Diagnostic Assessment: student should successfully complete the diagnostic to be considered exempt from the standard modules and qualified for the extension.
	• *Diagnostic assessment (optional?):*
	   • For students who already have a very strong in Excel/statistics they could maybe be "exempt from attending modules" or "recommend for extension", however they would still complete the formative and summative assessments, and would be welcomed to attend modules. The pre-test would also provide information regarding the group's background, so that the instruction can be adapted to each group's needs, allowing for differentiation (remediation / extension / inclusion of methods that cohort identifies as useful).
	
	• *Formative Assessments:*
	• *Informal*
	   • Class observations and dialogues (sample research interpretations, using Excel, data analysis, etc.) (4.1, 4.4, and 1.1-1.4, 2.1-2.4, 3.1,3.2 depending on instructional activities to be used).
	   • Group update meetings with field mentor(s) and/or faculty.
	• *Formal*
	   • Application assignments: types of variables and scales of measurement differentiation, graphical and numerical summaries using Excel, quantitative data descriptions. Questions will focus on conceptual and procedural knowledge. (1.1-1.4, 2.1-2.4, 3.1-3.4)
	     o Group reflections or report updates on their group projects (1 or 2). (4.2,4.3)

Stage 1 – Desired Results	
- Formative Assessments: these are to be graded more for completion and to provide feedback to the student. - Research Analysis: students should score well enough to demonstrate mastery of the objectives covered. It does not seem unreasonable to want 80% or better for this summative assessment. - Authentic Assessment: One section of the rubric for this project should be devoted to the objectives of this unit. Clear demonstration of these objectives should be evident in the written report or technical report. Students should earn 80% or more of the points in this portion of the rubric to be considered mastered.	○ Group project advances (for this unit we would focus on the quantitative section) (1.1-1.4, 2.1-2.4, 3.1-3.2). *Summative Assessments* ○ *Authentic Assessment:* described under Performance Task. ○ *Test. Research analysis*: students would be provided with a summary of published research samples providing sufficient background information, with focus on the quantitative research. They will be asked to interpret the results from quantitative research, critique the quantitative methods used, and state the procedural steps used to carry out these tasks. (This could also include prompts to assess the affective objectives) (4.1, 4.4). *Other* ○ Field mentor(s) evaluation (1.1, 1.2, 1.4, 2.1-2.4, 3.1,3.2).

Stage 3 – Learning Plan

Learning Activities: (L)

W = Diagnostic Assessment. Will help students get a brief idea of what the course is, what is expected, as well as help the instructor understand the prior knowledge that each group has to differentiate and adapt instructional activities for the unit.

H= The use of real data in class activities as well as in the partnership institution (performance task) will be used to motivate students, hold their interest, and value the use of quantitative data in their professional arenas.

E= Formative assessments (informal and formal) will help equip students with the necessary skills and foundation to master unit objectives. The authentic assessment experience will also expose them and solidify these skills.

R= Group project advances, assignment feedback, and reflections provide opportunities for students to rethink and revise their understanding.

E= Individual reflections, as well as group project provide allow students to evaluate their work and implications.

T= Using differentiation strategies such as the use of the diagnostic test to adapt instruction to the given group, the option to be exempt from certain class modules, or existing extensions for advanced learners provide plenty of opportunities to tailor learning.

O= Clear course organization in modules with resources, Webcourses availability, a clear schedule and instructor accessibility will provide effective learning.

Summary of Key Learning Events and Instruction

1. Diagnostic Assessment: for unit adaptation to student needs and differentiation.
2. Pre-reading for factual knowledge of the following terms: (definitions should support the conceptual knowledge that will be discussed during class)
   a. Mean
   b. Median
   c. Mode
   d. Standard Deviation
   e. Normal Distribution, Bi-Modal and Assumptions
   f. Skewness
1. Introduction/Review: types of variables and scales of measurement.
2. Model with Excel the following:
   a. Entering data, especially in a tabular form.
   b. Using the summary statistics feature.
   c. Using formulas to calculate: mean, median, mode, standard deviation, maximum value, minimum value.
   d. Create a bar graph and pie chart of categorical data.
   e. Create a histogram of interval/ratio data
   f. Create a boxplot, scatterplot, linear regression/best-fit line of bivariate data.
3. Application Exercises: students use real data from educational organizations (match K-12, higher ed, industry) to perform graphical and numerical summaries using Excel, and to differentiate between types of variables and scales of measurement.

Stage 3 – Learning Plan

4. Review education-related published articles in class and discuss the methodology (articles should be pre-read and exemplars of good/bad methodology)
    a. How was the sample obtained and how was the sample size determined? (Emphasis on selecting samples according to the type of study conducted: case studies, action research, randomness, variability, satisfying assumptions of normality, etc).
    b. What is an effect size? Tie back to standard deviation
    c. What is a p-value? Tie back to standard deviation and normal distribution
    d. What is the Pearson Correlation Coefficient? Tie back to scatterplot and linear regression
    e. Is it a good sample?
    f. Is it an appropriate technique?
    g. Does the analysis support the conclusion?
    h. What might have worked better?
    i. Conclude – tie to **(U)** - Most tests are just a test of comparison (regression) or difference (t-test, ANOVA, ANCOVA, MANOVA)
5. Summative Assessment meetings (as required) and advances feedback (as scheduled).
6. *Extension*
    o This section is optional and included for differentiation purposes for advanced students or those that would like to go further within the unit.
    - Carry out with Excel and interpret further statistical analyses of educational data.

Prototype: EDF 7478 – Analysis of Data for Complex Problems of Practice, Applied
Quantitative Analysis Unit Redesign

Unit 3: Applied Quantitative Analysis

Big Ideas:
- **Data analysis as correlation or differences.**

Tentative Time: 4 weeks

Topics	Essential Question(s)

1. **Data Representation (Excel)**
• Introduction/types of variables and scales of measurement (review)
• Tabular display
• Graphical display for one and two variables
    ○ Categorical Data (bar graphs, pie charts)
    ○ Numerical Data (histogram, scatterplot, linear regression/best-fit line)
• Percentiles (boxplot)
	- What is the best way to represent quantitative data?
	- How can we use excel to represent different types of data?

2. **Population Parameters** • Univariate and bivariate: central tendency, spread, shape, scatterplot interpretation, Pearson's correlation, • Tests of significance and variance	- How can we best describe quantitative data?
3. **Normal Distribution** • Normal/symmetric • Skewness	- How is statistical tendency used?
4. **Statistics in Research** • Application of learned skills in published research	- How does the use of statistics help us identify, analyze and evaluate a complex problem of practice?
5. **Extension (Differentiation): Perform further tests of significance and variance.**	

Prototype: EDF 7478 Applied Quantitative Analysis Unit Learning Objectives (Anderson & Krathwohl, 2001; Pratt, 1994)

Topic	Objective(s) Students will be able to:	Kinds of Learning Outcomes	Cognitive Process	Priority (C= critical, I= important, D=desirable)
1	1. Differentiate between the different types of variables and scales of measurement.	Conceptual	Analyze	C
	2. Construct suitable graphical summaries of data using Excel (categorical, numerical, and percentiles).	Procedural	Apply	C
	3. Use Excel effectively to analyze and interpret graphical displays data.	Procedural	Apply	I
	4. Describe graphically and numerically the relations between two quantitative variables.	Conceptual	Understand/ Apply	C
2	1. Produce numerical summary statistics using Excel (measures of central tendency, dispersion).	Procedural	Apply	C
	2. Explain which data summaries are suitable for which type of data.	Conceptual	Understand	C
	3. Perform and interpret statistical tests of significance and variance.	Conceptual	Apply	C
	4. Use measures of central tendency and dispersion to describe data.	Conceptual	Apply	C
3	1. Understand properties of the normal curve.	Conceptual	Understand	I

Topic	Objective(s) Students will be able to:	Kinds of Learning Outcomes	Cognitive Process	Priority (C= critical, I= important, D=desirable)
	2. Describe the impact of skewness statistics.	Conceptual	Understand	I
4	1. Interpret results from existing quantitative research within an empirical (and theoretical) context.	Conceptual	Apply	C
	2. Value the applicability of quantitative research to practice.	Affective		D
	3. Feel more efficacious about the research skills acquired.	Affective		D
	4. Critique quantitative methods used in existing research.	Conceptual/Procedural	Evaluate	C
5 (Extension)	1. Interpret further statistical analyses used in social/behavioral sciences.	Conceptual	Understand/ Apply	D
	2. Use Excel/ SPSS to perform further statistical analyses.	Procedural	Apply	D

APPENDIX F: INDIVIDUAL RESEARCH COURSE CURRICULUM INFORMATION SHEETS

EDF 7457 Curriculum Map Information Sheet

Curriculum Map Information Sheet

(Adapted from Jacobs, 2004)

Department: Teaching, Learning and Leadership   Date: Fall I

Course: EDF 7457 Data, Assessment & Accountability   Instructor: Dr. Carolyn Hopp

	Module 0/1	Module 2	Module 3	Module 4/5
Content	Quantitative and Qualitative Research Resources/Defining Work	Examining Literature	Examining and Understanding Problems	Qualitative Research Protocols/Knowledge Work
Skill/Learning Objective(s)	• understand how work is defined in multiple contexts; • to examine individual work contexts and actions required; • to understand the complexity of positionality and know what it is individually; • to situate the work of the Dissertation in Practice within the context of work.	• complete an annotated bibliography; • provide annotations that address the complex problem of practice and its context; • demonstrate the capacity to discuss the literature.	to build contextual knowledge of practice; to situate the problem of practice within the context of the specific organization; to develop a detailed description of the problem and its significance.	understand the importance of effective communication in organizations; understand how rules of behavior impact the organization; practice qualitative documentation; document an event within the organization, playing close attention to communication and rules.

	Module 0/1	Module 2	Module 3	Module 4/5
Formative Assessment				
Instructional Strategies				
Summative Assessment	• Problems in Context	• Determining Positionality • Designing a Question (posted as discussion board)	• Annotated Bibliography • Initial analysis of the problem	• Using qualitative methods • Synthesis of work
Essential Questions/ Other				

Note. Blank cells were used when information was not available or applicable.

Course Objectives:

- Engage in the study of problems of practice;
- Define a potential problem of practice for the dissertation;
- Understand how to read and analyze educational research;
- Determine methods for analyzing effective programs, models, or program evaluations.

EDF 7494 Curriculum Map Information Sheet

Curriculum Map Information Sheet

(Adapted from Jacobs, 2004)

Department: School of Teaching, Learning and Leadership   Date: Spring I

Course: EDF 7494 Identifying Complex Problems of Practice   Instructor: Dr. David Boote

	January	February	March	April	May
Content		Qualitative: Interviewing, sampling, observation Survey design and administration	Proposal and IRB Submission Literature Review	Gap Analysis	
Skill/Learning Objective(s)					
Formative **Assessment**		Goals, evaluation questions, blueprint draft	IRB Draft		
Summative **Assessment**	CITI Training		Evaluation proposal submitted to IRB	Test: Survey and Interview Methods	Gap Project Attendance & Participation
Essential Questions/ Other					

Note. Blank cells were used when information was not available or applicable.

Objectives:
Data Collection & Analysis
1. Understand and apply basic principles of testing, measurement, and interviewing.
2. Use data to identify and understand problems of practice.
3. Identify problems in professional practice that require additional study.
4. Demonstrate integrity in data collection and analysis, avoiding fabrication, falsification, omission, or manipulation.*

5. Understand and apply basic descriptive statistics.
6. Understand and apply ethical principles for research with human participants. *

Research Critique & Literature Review
7. Systematically search for published research and scholarship to support professional practice.
8. Construct a review of literature focused on a complex problem of practice.
9. Communicate professional opinions in a scholarly manner, written and verbal.

Academic Ethics
10. Appropriately attribute authorship (avoiding plagiarism and self-plagiarism) and authorship credit.
*11. Demonstrate personal integrity in academic settings, avoiding conflicts of interests (both personal and financial), integrity during examinations, and using respectful and professional interpersonal behavior. *
* RCR/Ethics designated objective

EDF 7478 Curriculum Map Information Sheet

Curriculum Map Information Sheet

(Adapted from Jacobs, 2004)

Department: Program Evaluation and Educational Research   Date: Fall II

Course: EDF 7478 Analysis of Complex Problems of Practice   Instructor: Dr. Cartwright

	August	**September**	**October**	**November**	**December**
Content	Week 1: Broad framework for analyzing complex problems of practice (quantitatively and/or qualitatively)	Weeks 2-3: Creating databases (computer lab). Distinguishing qualitative and quantitative queries. Quantitative: developing a database from varied sources to answer questions Levels of measurement Week 4: CASTLE Lab (optional) Week 5: Quantitative: How data are shaped (normal curve, standard scores, and probability (t	Week 6: Quantitative: Inferences about a single mean Week 7: Quantitative: Independent/ Dependent t-tests Week 8: Quantitative: Correlation and Linear Prediction Week 9: No class	Week 10: Qualitative: Design and Data Collection/Qualitative Data Analysis and Representation Week 11: No class Week 12: Qualitative: Research Report Week 13: Mixing Qualitative and Qualitative Data to Answer Questions for Complex Problems of Practice	Week 14: Project Due

	August	September	October	November	December
		and z scores)			
Skill/Learning Objective(s)					
Formative Assessment					
Instructional Strategies					
Summative Assessment		Hypothesis Development Database Development	Comparing Groups	Correlating Variables	Mixed Inquiry Analysis
Essential Questions/ Other					

Note. Blank cells were used when information was not available or applicable.

Objectives:

1. Identify a correct quantitative and/or qualitative procedure for answering a given research question for complex problems of practice.
2. Demonstrate the ability to develop a database for analysis using either Excel or SPSS.
3. Apply appropriate analyses, and interpret and summarize results obtained through various methods.

EDF 7468 Curriculum Map Information Sheet

Curriculum Map Information Sheet

(Adapted from Jacobs, 2004)

Department: Program Evaluation and Educational Research   Date: Spring II

Course: EDF 7468 Evaluation of Complex Problems of Practice   Instructor: Dr. Bonnie Swan

	January	February	March	April	May
Content	• Overview, Purposes of Evaluation, General Issues (Week 1) • History of Evaluation, Organization of Evaluation Studies, Causation (Week 2) • Issues and Ethics; IRB, Guiding Principles and Standards, Organization of Approaches (Week 3)	• Evaluation Approaches (EA): Consumer-Oriented, Expertise-Oriented, Accreditation (Week 4) • EA: Program-Oriented, Decision-Oriented (Week 5) • EA: Participant-Oriented, Developing Cultural Competence (Week 6) • Capacity Building and Mainstreaming, Comparative Analysis of	• Midterm (Week 8) • Spring Break (Week 9) • Understanding needs and responsibilities, Program Theory, Political Context (Week 10) • Stakeholders, Questions and Criteria, Absolute vs Relative Standards (Week 11) • Evaluation Activities, Organizing and Planning, Developing Budgets and Agreements	• Data Analysis and Design, Validity Issues, Sampling and Cost Choices (Week 13) • Data Sources, Methods, Analysis and Interpretation (Week 14) • Reporting Results, Maximizing Use and Understanding (Week 15) • Culminating Activity (Week 16)	• Final Exam (Week 17)

	January	**February**	**March**	**April**	**May**
		Approaches, Logic Models (Week 7)	(Week 12)		
Skill/Learning Objective(s)	• See below				
Formative Assessment	• Practice Quizzes • HW: Readings, Qs • Discussions	• Ind. project advances • Practice Quizzes • HW: Readings, Qs • Discussions	• Ind. project advances • Practice Quizzes • HW: Readings, Qs • Discussions	• Ind. project advances • Practice Quizzes • HW: Readings, Qs • Discussions	
Summative Assessment		• Group Project Presentations (1 and 2) • Critique of Related Research	• Group Project Presentations (1 and 2) • Midterm Exam	• Individual Project Assignment	• Final Exam
Essential Questions/ Other					

Note. Blank cells were used when information was not available or applicable.

Objectives:

1. Understand the history, influences, and evolution of evaluation across disciplines.
2. Examine and critique the conceptual distinctions between contemporary theories of evaluation practice.
3. Understand classic, current, and new directions for research on evaluation.
4. Identify and critique published evaluation studies and formulate sound inferences grounded on data.
5. Apply evaluation standards to identify political, social, ethical, and methodological problems in professional practice necessitating further investigation.

6. Demonstrate knowledge, understanding, and skills to search for published research resources and acquire published research to support professional practice.
7. Demonstrate understanding of sound research methodology, evaluation, and dissemination of findings.
8. Compose evaluations that are theoretically grounded.
9. Communicate professional positions in a scholarly manner in both written (APA Publication Manual) and oral modalities.
10. Design an evaluation plan to determine the success of a program at an organization using the most appropriate evaluation methodologies.

APPENDIX G: RESEARCH CONTINUUM CURRICULUM MAP

This figure shows the connections between Ed.D. in Curriculum and Instruction program objectives and all research continuum courses. It provides further visual representation of the how program objectives are supported by research continuum courses and their learning outcomes.

Ed.D. in Curriculum and Instruction University of Central Florida	
Program Objectives	1. Identify and understand issues of learning, development, motivation, and organizational theory. 2. Name, frame, and critically examine complex problems of educational practice through multiple perspectives. 3. Engage in systematic inquiry to analyze complex problems of educational practice. 4. Design, develop, and implement innovative solutions to complex problems of practice. 5. Apply the principles of improvement science and evaluation to build organizational capacity and effect practice/program improvement. 6. Create a positive impact on an organization, employer, or community as an agent of change. 7. Use evaluative inquiry to assess various alternative solutions to complex problems of practice and determine the most suitable one. 8. Acquire advanced specialized knowledge and skills in a particular area of educational practice.
Research Continuum Courses	• EDF 7457 • EDF 7494 • EDF 7478 • EDF 7468
Learning Outcomes *Students can:*	EDF 7457: Data, Assessment, and Accountability • Define systematic inquiry. • Differentiate between the main types of research designs. • Distinguish traditional research from action research. • Engage in the study of problems of practice. • Examine individual work contexts and actions required. • Understand and describe positionality and its complexity. • Situate the problem of practice within the context of the organization. • Create an annotated bibliography to inform a problem of practice. • Use the annotated bibliography to develop a detailed description of the program and its significance.

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- Create a Logic Model for the program/unit being evaluated.   - Define short-term, intermediate, and individual performance measurable goals to determine the existing gaps.   - Differentiate between quantitative and qualitative methods.   - Demonstrate proficiency in following qualitative research protocols   - Use quantitative/qualitative data to support the existing gap.   - Use education technology applications and productivity tools to process, display and analyze data and document academic growth.   - Identify knowledge, motivational and organizational causes of gaps using research-based theories to support them.   - Determine innovative knowledge, motivational and organizational solutions for closing the gap grounded in theoretical and practical research.   - Develop an evaluation plan using Kirkpatrick's Four-Level Evaluation model for the proposed gap solutions.   - Understand the connection between gap analysis and evaluative inquiry.   - Value the applicability of systematic inquiry to examine complex problems of practice at learning organizations.   - Communicate written professional opinions in a scholarly manner, as defined by APA guidelines.   EDF 7494: Identifying Complex Problems of Practice   - Demonstrate integrity in data collection and analysis, avoiding fabrication, falsification, omission, or manipulation.*   - Understand and apply ethical principles for research with human participants. *   - Demonstrate personal integrity in academic settings, avoiding conflicts of interests (both personal and financial), integrity during examinations, and using respectful and professional interpersonal behavior. *   - RCR/Ethics designated objective   - Understand and apply basic principles of testing, measurement, interviewing, and surveying.   - Use data to identify and understand problems of practice.   - Identify problems in professional practice that require additional study.   - Understand and apply basic descriptive statistics.   - Use education technology applications and productivity tools to process, display and analyze data and document academic growth.   - Identify, understand, and critique published research to formulate

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	University of Central Florida	
	sound inferences grounded on data and the literature that support professional practice.
	• Construct a review of literature focused on a complex problem of practice.
	• Appropriately attribute authorship (avoiding plagiarism and self-plagiarism) and authorship credit.
	• Communicate professional opinions in a scholarly manner, as outlined by APA guidelines.
	• Value the applicability of mixed methods to evaluate a complex problem of practice and change.
	EDF 7478: Analysis of Data for Complex Problems of Practice
	• Define "change" and "improvement" in the context of improvement science.
	• Create a Logic Model for the program/unit being evaluated.
	• Articulate how the framework for the Model for Improvement can be used to turn ideas into action and learning.
	• Use the PDSA (Plan-Do-Study-Act) cycle to build profound knowledge and test/implement a change that can be applied to practice for improvement.
	• Apply literature review principles (appropriateness, timeliness, scholarliness) to support the "planning stage" in an improvement initiative.
	• Apply suitable qualitative research methods to collect, analyze, and present data that will inform the improvement decision process.
	• Apply suitable applied quantitative research methods to collect, analyze, and present data that will inform the improvement decision process.
	• Use education technology applications and productivity tools record, document, analyze and disseminate findings.
	• Understand the connection between improvement science and evaluative inquiry.
	• Value the applicability of improvement science to address complex problems of practice at learning organizations.
	EDF 7468: Evaluation of Complex Problems of Practice
	• Understand the history, influences, and evolution of evaluation across disciplines.
	• Understand classic, current, and new directions for research on evaluation.
	• Differentiate between formative and summative evaluations.

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	• Differentiate between internal and external evaluation/evaluators. • Apply evaluation standards to identify political, social, ethical, and methodological problems in professional practice necessitating further investigation. • Examine and critique the conceptual distinctions between contemporary theories of evaluation practice. • Identify and critique published evaluation studies and formulate sound inferences grounded on data. • Apply advanced research skills to acquire peer-reviewed research to support professional practice. • Identify and describe a complex problem of practice to be evaluated. • Plan a formative/summative evaluation utilizing principles of program theory and effective evaluation practices. • Use education technology software applications and productivity tools to process, display, and analyze data, and document academic growth. • Demonstrate understanding of sound research methodology, evaluation, and dissemination of findings. • Identify what quantitative and qualitative data must be collected to address evaluation questions. • Communicate professional positions in a scholarly manner in both written (APA Publication Manual) and oral modalities. • Value the applicability of evaluative inquiry to effect program improvement.

APPENDIX H: EDF 7478 PERFORMANCE TASK

EDF 7478 Authentic Assessment: Improvement for Learning Performance Task

Instructional objectives

● Understand the connection between program theory and improvement science.
● Use quantitative and quantitative analysis to establish the need for organizational "change" and to determine the effectiveness of the implemented change(s) for results in the desired improvement.
● Create, develop, and implement an improvement initiative to address a complex problem of practice at their learning organizations.

Description

● For this summative assessment students will create, develop, and implement an initiative to improve student learning in their organizations. Students will select a course or unit from one of their own classes, which has proven to be challenging for students, or an aspect of an organizational program that needs improvement. You could also design a unit based on improvement science to carry out with your students. This project has been scaffolded so that students can receive feedback on the components of their improvement project, as well as to ensure that they master all course objectives. The completed final report will be presented in the form of an e-portfolio, and will contain the following components.
● In-depth description of the course unit or program and the organization.
● Logic Model (LM) and process diagram to organize the improvement process.
● Model for Improvement Framework components:
    ○ *1. What am I trying to accomplish with this improvement initiative?*
        ■ State your goals for the improvement effort. Design choices.
    ○ *2. How will you know that change is improvement?*
        ■ What types of measure will you use? (Test scores, observations, student focus groups, gauge interest, engagement (through affective objectives)
    ○ *3. What changes can you make that will result in improvement?*
        ■ Relate to your LM and process diagram. How many PDSA cycles will you be implementing (at least two) - how many times a year is the course unit/EDP program taught? How much time will your students have to implement the cycles?
            ● Existing qualitative or quantitative data can be used to support "need" if available (end of course surveys, feed
    ○ *4. PDSA Cycles - Cycle 1*
    ○ Plan (Literature Review Module)
        ■ Review your lesson plan/program schedule. Carry out a literature review following the best practices outlined in the module to incorporate research-

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based best innovative practices for the LP being developed. Include research on teacher and/or student perceptions about the program/unit and possible causes (tie to Gap analysis/frames) of the problems such underperformance or barriers to learning.

- ■ Use your research to redesign or enhance the unit, program, schedule, sequence, college course, etc. Design choices clear.
- ■ Develop any additional materials that are needed to implement the newly developed plan.

○ Do (Qualitative and Quantitative Methods Module)

- ■ Implement your change (new lesson plan, section of program, etc.), and note which other units or program sections could also benefit from this newly develop approach.
- ■ Revise Model for Improvement Part 2 *"How will you know that change is improvement?"*
  - ● What qualitative and quantitative data will you collect to ensure that the change you are implementing is actually resulting in an improvement? (immediate feedback-think of it as a formative assessment for your implementation plan).
  - ● What qualitative methods will you employ to document the impact of the change (survey, interviews, focus groups, etc). Submit IRB if needed.
  - ● Once the applied statistics module has been completed in class, you can go back to the plan section and incorporate different analyses (descriptive statistics, correlation, regression, t-tests, ANOVA, etc.)
  - ● How will you process and present data so that it can be used during the "Study" phase?
    - ○ Use the applied statistics module to determine which type of graphs are the most suitable to represent your data.

○ Study

- ■ What is the data telling you? Is the implemented "change" working? Are you seeing any improvements? Use the data to support your conclusions.

○ Act

- ■ Keep the changes that are working and continue using them.
- ■ Remove any changes that had no effect. Correct/modify/enhance lesson to try to rectify the changes that did not work or to implement new changes that will result in improvement.
  - ● Use more literature review to support those changes.

○ *PDSA Cycle II*

- ○ Plan II
    - ■ Your LP, program or unit now contains changes that resulted in improvement from the first PDSA cycle, and the new ones you incoporated during the previous "Act I" phase.
        - ● What are these new changes? Document them.
        - ● If all the first cycle changes resulted in improvements, then incorporate changes and learnings into other areas/units noted during the "Do I" phase.

- ○ Do II
    - ■ Carry out the new Plan II.
    - ■ Make sure to note differences in class composition, engagement, or other variations that may affect the implementation.
    - ■ Repeat steps for data collection, processing and presentation.
        - ● Will you use the same methodology and carry out the same analyses? Support your decisions.
- ○ Study II
    - ■ Did performance increased as shown by test scores?If so, where the assessments given of the same level/comparable? Has the level of engagement increased?
- ○ Act II
    - ■ Retain changes that actually resulted in improvements.
        - ● How will you share these knowledge?
            - ○ Speak with other faculty members and collaborate to create change in similar units/programs. Develop cycles for other units/LP/programs and for continuous improvement.
- ○ *5. Discussion*
    - ■ Your discussion should address the essential questions in parts 1-3.
    - ■ Support the change implemented as the source for improvement by utilizing data.
        - ● Did you use all the data?
        - ● Was the improvement really due to the implemented change or due to variation in cohorts/groups of students?
    - ■ Make recommendations based on your PDSA cycle implementations.
    - ■ How will you share your results with other educators and collaborate ti implement changes for continuous improvement?
- ○ *6. Forms: to be completed throughout the project*
    - ■ Complete the Model for Improvement form (see example below)
    - ■ Complete the PDSA Cycle form with checklist format

○ *7. References*

● *Note.* The final project should include at least two fully implemented PDSA cycles. If more cycles are needed and there are time constraints, include the completed "Plan" phase for the other cycles.

Product

● The project will be submitted in the form of a digital portfolio or website. Resources to be used include any website authoring software Dreamweaver, Weebly, NVU, KompoZer, Google Web Designer, Google Sites, etc.

Self-Reflection

● Use the following essential questions to guide your self-reflection:
  ● What is a change that results in improvement?
  ● How can we know when a change is an improvement?
  ● What changes can we make that will result in improvement?

Model for Improvement Cycle Form
(adapted from Langley et al. 2009)

Date:

Change of idea evaluated:

Objective for this PDSA cycle:

What questions do we want to answer with this PDSA cycle?

PDSA Cycle

PLAN

Plan to answer questions (test the change or evaluate idea): What, Who, When, Where?
    Plan for collecting data needed to answer these questions.
    Null Hypotheses (for each question listed, what will happen if plan is carried out? Discuss theories).

DO

Carry out the plan; document problems and unexpected observations; collect data and begin analysis.

STUDY

Complete analysis of data. What were the answers to the questions in the plan (compare to predictions)? Summarize what was learned.

ACT

What changes are to be made? Plan for the next cycle.

APPENDIX I: EDF 7468 TECHNOLOGY-RICH ASSESSMENT SAMPLES

Expert Interview Assignment

Overview

Students will be assigned to present and discuss one case study interview from Evaluation in Action: Interviews with Expert Evaluators and other relevant information they learn about the evaluator and topic(s). This assignment will take us behind the scenes of a real evaluation to explore the issues faced, and decisions made by expert evaluators in the field.

Objective

Students will be able to collaboratively work in groups of 2-3 to:

Create an innovative presentation in the form of a podcast, multimedia presentation or digital video to discuss one case study interview assigned from *Evaluation in Action: Interviews with Expert Evaluators* through the effective use of digital technologies.

Activities

This assignment consists of two parts are follows:

Part I: Group Presentation
You will create a 10-15 minutes long digital presentation in the form of a series of podcasts, multimedia presentation, or video using one or a combination of the following educational technologies of your choice (please refer to the rubric in the "evaluation" section for details):

Office Mix for PowerPoint (narrate slides, embed audio and video, inking, conversion to video, etc.)
Camtasia (screen recorder and video editor)
Screencast-o-Matic (screencasting)
Audacity (audio recorder & editor)
Audacity Lame Encoder (audio converter from .wav to .mp3)
iMovie, Movie Maker, Adobe After Effects (video authoring software)
Please note that the presentation must be innovative so you are encouraged to think outside of the box!

To help you prepare for the presentation read the assigned interview, answer the discussion questions at the end, and read the suggested further readings. Additionally, read the Case Studies section of the chapter(s) referenced in the presentations schedule from Fitzpatrick, Sanders, and Worthen (2010).

The presentation should address the following items:
Introduce the evaluator. What is their background?
Briefly describe the program they evaluated and its rationale.
Reconstruct the evaluation plan from the article and other relevant content you found to

describe it. Frame content around these questions: *What was the evaluation approach? Were the evaluation questions the study answered? What information was collected? What designs, sources, and methods did the evaluator use?*
Describe dilemmas (if any) that arose when dealing with stakeholders.
How and to whom did they disseminate evaluation results?
What did you learn about the main topic? How does this fit within the course?

Part II: Personal Reflection
Write an <u>individual</u> reflection using the 3R format provided in class about the interview and what you have learned from the additional reading(s) listed in the text and other sources. Please include a cover page.

Evaluation

Your presentation must be uploaded to <u>DropBox</u> (or other storage platform), and the link must be submitted under "assignments" together with your individual 3R reflection.
After, please share the link on the corresponding discussion board in <u>Webcourses</u> (one per group). *This must be done on or before your presentation day.*
Lastly, please view at least two of your classmates' presentations and engage in meaningful academic conversations with them about their presentations. You will have one week after the submission due date to complete this discussion posting.
Please refer to the assignment rubric found in Webcourses.

Tutorials

<u>Office Mix</u> Tutorial
<u>Camtasia</u> Tutorial
<u>Screencast-o-Matic</u> Tutorial
<u>Audacity</u> Tutorial
<u>Lynda.com</u> (for After Effects, iMovie, Movie Maker, and others)

Expert Interview Group Presentation Rubric

		DIGITAL PRESENTATION		
	Exemplary (4)	Proficient (3)	Emerging (2)	Unsatisfactory (1)
Presentation done using the suggested (or otherwise approved) resource			Presentation done using the suggested (or otherwise approved resource).	Presentation not done using the suggested (or otherwise approved resource).
Narration is clear, enthusiastic, natural, appropriate change in tone and academic	Narration is clear, enthusiastic, natural, appropriate change in tone and academic.	Narration is clear, enthusiastic, natural, some appropriate change in tone and academic.	Narration is clear, monotone and/or unnatural, does not present changes in tone and is somewhat academic.	Narration not clear, monotone, unnatural, does not change in tone and informal.
Content & organization	Content includes introduction, body that addresses all critique questions and elements, and a solid conclusion. Logical presentation of items.	Content includes introduction, body that addresses all critique questions and elements, and a solid conclusion. Logical presentation of items with ideas not fully developed.	Content is missing some components, and the presentation of items is not logical.	Contents missing components and illogical presentation of items/ideas.
Length			Presentation is between 15 and 20 minutes long.	Presentation is not between 15 and 20 minutes long.

EXPERT INTERVIEW & REFLECTION				
	Exemplary (4)	Proficient (3)	Emerging (2)	Unsatisfactory (1)
Evaluator introduction	The evaluator is introduced and his/her background thoroughly explained. Evidence of further readings.	The evaluator is introduced and his/her background is well explained.	The evaluator is introduced and his/her background is described superficially.	The evaluator is not introduced and/or his/her background in not explained.
Program description	Program evaluated and rationale are thoroughly discussed.	Program evaluated is described and the rationale is discussed with little detail.	Program evaluated described and rationale absent or rationale is discussed but the program evaluated was not described/superficially described.	Program evaluated and rationale are not mentioned.
Evaluation plan	Evaluation plan reconstructed with great detail: evaluation approach stated and explained, evaluation questions stated, description of information collected, and designs, sources, and methods used.	Evaluation plan reconstructed: evaluation approach stated and explained, evaluation questions stated, description of information collected, and designs, sources, and methods used (one item may be missing or with minor errors)	The evaluation plan is vaguely reconstructed. Some items are missing or lacking detail.	The evaluation plan is either not included or explained superficially/with many errors.
Dilemmas	Dilemmas discussed in great detail (if applicable).	Dilemmas discussed with some detail (if applicable).	Dilemmas vaguely discussed (if applicable).	Dilemmas not discussed (if applicable).

EXPERT INTERVIEW & REFLECTION				
	Exemplary (4)	Proficient (3)	Emerging (2)	Unsatisfactory (1)
Dissemination of findings	Includes a detailed explanation of dissemination of findings (how, to whom…)	Includes some explanation of dissemination of findings.	Includes vague explanation of dissemination of findings.	No explanation of dissemination of findings.
Topic and connection to course	Strong evidence of knowledge and understanding of the topic in connection to the course.	Evidence of knowledge and understanding of the topic in connection to the course.	Little evidence of knowledge and understanding of the topic in connection to the course	No evidence of knowledge and understanding of the topic in connection to the course.
Innovation	Presentation is original, engaging, enthusiastic, and outside the box.	Presentation is original, engaging and enthusiastic.	Presentation is somewhat original/engaging and/or enthusiastic.	Presentation lacks originality, and is not enthusiastic.
3R Reflection	Reflects great depth of knowledge and learning, reveals feelings, and thoughts through specific details. No errors in grammar/spelling, logical presentation of ideas, engaging conclusion. Follows the 3R format.	Relates learning with course activities, personal and general reflections included with concrete language. Almost no errors in grammar/spelling, logical presentation of ideas and transition. Conclusion restates learning. Follows 3R format.	Does not go deeply into reflection of learning, generalizations and limited insight, uses some detail. Many errors in grammar and spelling, logical organization but presentation of ideas is not fully developed. Conclusion does not adequately restate the learning. Follows 3R format with some omissions.	Little or no explanation or reflection on learning. None or few details to support reflection. Numerous and distinct errors in grammar and/or spelling, no evidence of structure and/or organization. Conclusion is absent, incomplete and/or unfocused. 3R format not followed or with major errors.

DISCUSSION BOARD				
	Exemplary (4)	Proficient (3)	Emerging (2)	Unsatisfactory (1)
Link shared to discussion board			Link shared.	Link not shared.
Academic exchanges with at least two classmates	Academic exchanges are valuable, respectful, and in-depth contributions to learning.	Academic exchanges are useful, respectful and contribute to learning.	Academic exchanges are somewhat useful, respectful and contribute to learning.	No academic exchanges with classmates or academic exchanges are not valuable and/or respectful and/or contribute to learning

Module 6: Reporting Evaluation Results Using Digital Storytelling

Essential Questions

- How can we communicate evaluation results to maximize use and understanding?
- What considerations are important when tailoring evaluation results to different groups of stakeholders?
- How can we use digital storytelling to disseminate of evaluation results?

Introduction

Evaluators must thoughtfully contemplate how evaluation results might be used in ways that are useful. Even though reporting results is regarded as the last step in the process, it is important to report results throughout the entire evaluation process, in order to maximize understanding and learning (Fitzpatrick, Sanders, & Worthen, 2011). Given that reporting entails engaging in meaningful dialogue with the main groups of stakeholders, as well as taking into consideration the main purpose of the evaluation (formative or summative) to make decisions about a given program, it is imperative to communicate results in an interactive and compelling manner (Fitzpatrick, Sanders, & Worthen, 2011). As such, evaluation reports must contribute to the dissemination of findings, and tell an unbiased, yet technical compelling story that will allow for the successful implementation of recommendations made by the evaluator team.

Digitally storytelling can be simply defined as the use of computer-based tools to tell stories (University of Houston, 2016). These stories contain a mixture of digital images, text, audio, narration, video excerpts and/or music, which typically are around 2-10 minutes long. They are also known as multimedia stories (University of Houston, 2016). Digital storytelling is an effective teaching and learning tool for the classroom, as it promotes the acquisition of 21st century skills like *critical thinking*, *creativity*, *collaboration*, *literacy*, and *communication*, among others.

The goal of this lesson is to give you the opportunity to learn about dissemination of results in an authentic manner. Collaborative teams will work together to create a digital story to report and disseminate evaluation findings to an assigned group of stakeholders. Your digital story will be based on one of the following scenarios:

1. MoNA Link Museum (audience: Skagit County elementary school teachers, and a group of Principals from the District that would like to implement the program)

2. Riverton Memoirs (audience: librarians that might want to replicate model, participants, and Kentucky authors)

The instructional activity consists of three parts.

Part I. In preparation for class, read Fittzpatrick, Sanders, and Worthen (2011) Chapter 17. Also, please review the PowerPoint presentation for this week. After you have completed the readings,

watch the following video about digital storytelling. You might also read this article on Storyboards to get more information. Also, visit the Common Craft site provided under resources, to see examples of digital stories.

Part II. During class, you will work together to create storyboards using the Storyboarding template to represent how you would report the final evaluation findings for the given scenarios as a digital story. *Remember that digital stories must tell a compelling story, be engaging and tailored to the particular type of audience you wish to communicate the findings to.* You can share these via Google Doc to ensure collaboration, and for peer feedback. Digital stories can be made using any type of video production application software, or presentation software. You may want to create a storyboard taking into account that you would be using a presentation application such as Prezi or PowerPoint. However, you may also choose to develop the storyboard for a video application (music, audio, etc.). The resources that follow will help you during the storyboarding process. Make sure to read them all before carrying out this activity.

Part III. Once these have been completed, you will use your storyboard to create the digital story about evaluation findings for the assigned scenario and stakeholder group. Your digital stories should be between 6-10 minutes long. Please upload your presentation link to the discussion area in Webcourses. Make sure to watch and engage in professional conversations about your peers' presentations. To view a sample product please click here.

Resources

If you'd like to learn more about digital storytelling visit Kathy Schrock's Guide to Everything for more resources. Also, for access to any application software tutorial visit Lynda.com.

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