CHAPTER TWO

New Mindsets and a New Dissertation Frame

Building on the idea of developing scholarly practitioners with Dissertations in Practice (DiPs) using an improvement science frame, this chapter will a) provide a rationale for educational translational researchers; b) explain why improvement science is a science; c) explain the distinction between a DiP and a traditional 5-chapter dissertation; and d) present a new framework for an Improvement Science Dissertation in Practice (ISDiP).

If you are a student in an EdD program, you may know someone who has successfully written and defended their dissertation and you expect to do the same. You expect to be successful by working in isolation and putting in many hours and resources. It is also likely that you want your dissertation to matter, to not sit on a shelf collecting dust as so many do. As a working professional, you want your work to make a difference, to spread, and to be useful to others and yourself. As a doctoral student, you want to make it through graduate school, but you know that not all students who start a program finish. It is likely you know, or will come to know, a few ABD (All But Dissertation) students, those students who completed all of their coursework but never finished their dissertation. In education, attrition from doctoral programs is estimated at approximately 50%. In addition, about 20% of these give up at the dissertation

stage (Bowen & Rudenstine, 1992; Cesari, 1990).

If you are a faculty or committee member, it is likely that you have successfully written and defended your dissertation. You may recall the stress of trying to find a researchable topic (linked to your major professor's area of interest), writing an exhaustive literature review that situated your topic within the literature or filled a gap, securing a site to collect data, recruiting participants, setting out to gather data over several months, and then analyzing the data you collected in isolation. Your work likely produced deep knowledge about your topic in a specific domain and, given your position, it is likely that this served you well. Work from your dissertation probably became the start of your academic career and publication record. Your dissertation was likely a ritual object in a complex rite of passage developed to anoint a priesthood of scholars like yourself (Willis, Valenti, & Inman, 2010). The mental map you have of writing and defending your dissertation is one of pride and struggle. It contains all the good and bad emotions you experienced during the process. It is also likely that these positive and negative experiences will influence how you work with your students. Having received a PhD, you expect your students to be proud of their work, to work efficiently and individually. You expect a well-written, 5-chapter product that will in turn lead your own students to a faculty position and a publication record of their own.

As you read this chapter, be aware that students, faculty, and committee members come to the dissertation process with varied experiences, emotions, and expectations. This chapter will make you more aware of your own views and, hopefully, open your mind to the idea that dissertation work and products in EdD programs should both provide practical, applicable skills to practitioners and be useful and impactful. No matter who you are, this chapter will help you develop a new mindset around dissertations and the EdD.

New Mindsets: Translational Researchers

Dissertations can be mysterious, challenging, and the point in a doctoral program where students fall down. We contend that the dissertation experience does not have to be so complicated. For EdD students in particular, dissertation work can be productive (and even exciting) if it crosses the theory-to-practice divide. The right kind of dissertation work can improve contexts, develop thoughtful leaders, and expand professional knowledge that is useful to others. To accomplish these goals, we need to think about developing both the kind of individuals who can do this work and the type of training and culminating project they need. Educational research, including the research in dissertations, has not always been helpful in the practice arena. Over the years, many calls for change have been made. For example, Clandinin and Connelly (1995) argued that the propositional and theoretical knowledge from research that filters into practice has little appreciation for the personal, subjective, historical, and relational patterns that exist there. Likewise, in her 2012 presidential address to the American Educational Research Association, Arnetha Ball (2013) called for a new view of research, one that is generative and bridges the knowing-doing gap. To Ball, research needs to be aimed at the public good instead of offering large-scale solutions that fail to address real world problems. Others like Donovan (2013) have brought up the idea of using research for school improvement and noted three ways this can be accomplished: 1) change incentives in higher education by encouraging research that focuses less on the theoretical and more on problems of practice (PoPs); 2) develop interdisciplinary teams comprised of researchers, practitioners, and education designers; and 3) use real contexts for study by performing meaningful experimentation in schools. A little later, Gutierrez and Penuel (2014) noted the need for new, innovative approaches for research and development in education, citing the improvement work of Bryk, Gomez, and Grunow (2011) as a prime example. As President of the Carnegie Foundation for the Advancement of Teaching, Bryk (2018) continues to promote this work by advocating for new ways to bridge the growing chasm

between research and practice as a necessity to make things better for our most disadvantaged students and communities. Bryk (2018) also advocates for a research and development infrastructure that focuses on improving the learning of all students and doing so quickly through the rapid, iterative testing of change ideas.

To make educational research accessible and useful in practice, the field needs translational researchers, a term used in health care and other professions to describe individuals capable of bridging the research-community divide. Translational health-care workers share information between physicians, nurses, and patients. They move information from the research workbench to the patient's bedside (Bulterman-Bos, 2008; Smith & Helfenbein, 2008). However, to accomplish this kind of fluidity between research and practice, professionals need training that includes:

- transdisciplinary work focused on common problems and opportunities to solve them in multi-disciplinary teams;
- opportunities to use what they know and be original, creative, and innovative;
- common curricula to gain a solid understanding of both research and patient care;
- individualized curricula to expand interests;
- learner-centered faculty and advisory committees; and
- field work that enhances practical knowledge and communication skills (Bulterman-Bos, 2008).

This type of training develops translational researchers who work collaboratively to find practical solutions to everyday problems, make their findings accessible to those who need them, and influence practice, research, and policy. Translational researchers move information from the research workbench to the patient's bedside or cross the theory-to-practice divide (Ball, 2013; Latham, 2008). In education, professional practitioners create coherence between theory, research, and the everyday work in educational organizations.

We believe education needs translational researchers. We see scholarly practitioners who are prepared in EdD programs as these

individuals. We also see improvement science as a necessary part of scholarly practitioner training and dissertation work. Though work towards this goal has begun, it is not yet a reality everywhere. Gaps continue to exist between the geography of professional practice and the culture of universities. The flow of work in universities often bears scant resemblance to the rhythms and needs of PK-12 school life (Murphy, 2014b).

What Is Improvement Science?

> Education research would benefit from Improvement Science, which has methods tailored to rapid prototyping and testing, tools for detecting and learning from variation, and affordances to learn from widely different contexts. (Lewis, 2015, p. 59)

Improvement science is a methodological approach built on pragmatism and science that uses disciplined inquiry to solve PoPs. Improvement science focuses on high-leverage problems and the systems that surround those problems. It uses experiential and scholarly knowledge and data to understand if change efforts lead to an improvement (Bryk, Gomez, & Grunow, 2011). This methodology starts small and moves through multiple cycles towards a well-thought-out aim of improvement. The work of improvement science invites everyone affected by the existing problem to collectively learn their way together into stronger performance and better outcomes (Bennett, Grunow, & Meyer, 2018). In these ways, improvement science seemingly fits the needs of educators because it is both practical and rigorous and serves the purpose of a DiP. In EdD programs, improvement science encourages collaboration between students (practitioners) and their faculty, committee members (researchers), and stakeholders (organizational members).

To perform this type of work, the Carnegie Foundation poses Six Core Principles of Improvement (outlined in Chapter 1). Using these principles, the Carnegie Foundation is working with schools and organizations to produce quality outcomes (Bryk, 2018; Bryk,

et al., 2011; Bryk, Gomez, Grunow, & LeMahieu, 2015a; LeMahieu, Bryk, Grunow, & Gomez, 2017). CPED has built on this movement to bring improvement science into EdD programs in order to prepare leaders with the skills and abilities of improvement science to address the problems they face.

Practically, improvement science is what educators and organizational leaders do inherently every day: strive to improve their contexts systematically. Often, rather than or alongside implementing top-down mandates or outside reforms, educational practitioners regularly perform actions similar to improvement science, focusing on their own organizational problems (e.g., learning, behavior, motivation, resources), developing their own theories about these problems, and collecting data that inform their own efforts to improve these problems. Improvement science seeks to take this intuitive work a step further and support leaders in answering everyday questions using a systematic, systems-changing discipline inquiry process (Bryk, et al., 2015; Gutierrez & Penuel, 2014). Note Table 2.1 for an explanation of these ideas.

These questions are combined with Plan-Do-Study-Act (PDSA) *90-day* cycles (our version of this will be discussed in Chapter 7) so improvers work iteratively. They plan change efforts, do them,

Table 2.1. Questions Answered by Improvement Science and Reasons for the Questions

Question	Reason for the Question
What is hoped to be accomplish?	To specify, clarify, and contextualize a specific problem.
What changes would result in an improvement? What is the rationale for these?	To generate actionable changes based on the best reasoning and information available.
Why are changes thought to lead to improvement?	To provide a rationale as to why the chosen change ideas makes sense.
How might one recognize if a change led to an improvement?	To develop a process by which data are examined and from this, draw valid and reasoned conclusions about improvements made or not.

study what occurred, and decide on next steps. Working this way lets educators test their own theories within their own contexts and understand what worked, for who, under what circumstances, and why (Bryk, 2018). Improvement science moves research out of laboratory settings and randomized field trials into real world classrooms. Contextualizing improvement work in a dissertation process can create translational researchers who have skills, knowledge, and habits to break the cycle of failed educational reforms (Lewis, 2015; Mehta, et al., 2011).

Despite improvement science being a practical approach that encourages the integration of experiential knowledge with extant theory and applied social science inquiry, it is still a rigorous and scientific methodology. Improvement science is rooted in the work of Deming (1993), who spent much of his career advising corporations on how to create and manage their outcomes, even as they evolved. His idea of *Profound Knowledge* helped organizations realize that four interrelated ideas could help them improve: 1) appreciation of a system, 2) knowledge of variation, 3) theory of knowledge, and 4) psychology. Improvement science, Total Quality Management, Six Sigma, Design-Based Research, and other improvement models rest on Deming's ideas and are being used by professionals in various fields (e.g., healthcare, agriculture, service sectors, manufacturing) to make systems function better (LeMahieu, et al., 2017; Lucas & Nacer, 2015). For the field of education, though improvement science is a fairly new methodology, it is a natural fit to be user centered and focused on high-leverage problems that have multiple interacting causes requiring diverse thinking. Improvement science is also a natural fit for practitioners who are often analogical scavengers, gathering and distributing ideas in thoughtful and precise ways (Carnegie Foundation for the Advancement of Teaching, 2015).

Lucas & Nacer's (2015) habits of health-care improvers (described in Chapter 1) align with the aspirations of professionals in EdD programs as well as the needs of the education profession. Instead of becoming subject area experts or developers of theory, EdD students want to become scholarly practitioners, capable of naming, framing, and solving the complex PoPs they face every day.

Students in EdD programs want to apply what they are learning to move their organizations ahead (Mintrop, 2016). Improvement science meets these goals because it allows students to investigate their own contexts and blend the practical, experiential knowledge they have with the scholarly knowledge they learn in their doctoral programs. EdD students take what they learn from their programs and apply it to their workplace, effectively becoming translational researchers who cross the theory to practice divide. Yet, despite the potential impact these practitioners can have in practice, some faculty, committee members, and others question the legitimacy of improvement science. They demand traditional methods and frames for student dissertations. To counter this hegemonic thinking in support of the needs of practitioners, the naysayers must be convinced that improvement science is scientific.

Is Improvement Science Scientific?

Science is a systematic and logical approach to discovering how things work. It tests theories and ideas and analyzes data based on fact, not opinion or preferences (Bradford, 2017). A science:

- produces a body of knowledge with a process of discovery (the scientific method) that allows the linking of isolated facts into coherent and comprehensive understandings;
- is exciting and motivating. Science encourages critical thinking, innovation, and problems solving;
- is useful, powerful, and reliable. Science develops new procedures, products, and processes;
- is ongoing. Science is never "finished." It continually refines and expands with new questions and ideas; and
- is a global human endeavor. People from every nation engage in science and make contributions to it (The University of California Museum of Paleontology, Berkeley, and the Regents of the University of California, 2013).

Science has these properties and rests on the scientific method, an empirical way of acquiring knowledge. The steps in the method include:

Step 1: asking a question;
Step 2: conducting background research;
Step 3: constructing a hypothesis. Why are things like this?;
Step 4: testing the hypothesis with an experiment; and
Step 5: analyzing the data gathered and draw reasoned conclusions.

Perla, Provost, and Parry (2013) have embraced the idea of improvement science being scientific and we agree with their propositions for several reasons. First, they believe PDSA cycles align with the scientific method because these cycles require a question, several predictions (hypothesis), gathering data to test the prediction, and an unbiased, reasoned way to analyze the data to determine whether the hypothesis was correct or not. In this process, personal theories are balanced with logic and justification. This is thinking scientifically using the scientific process. Second, Perla, Provost, and Parry note that improvement science is nested in the tradition of pragmatism, a frame that focuses on the practical aspects of what works and why. Pragmatics believe: (a) problems and questions are more important than underlying philosophical assumptions; (b) scientific inquiry is contextual in nature—past and current social, historical, and political conditions influence the scientific process; (c) the most effective forms of inquiry are multidisciplinary and multivoiced; and (d) not all findings need to generalize. The third reason Perla, Provost, and Parry believe improvement science is scientific is because of its use of what is known about human behavior and motivation. For example, psychology is used to understand how people learn, why they are motivated, and how they react to change. Systems theory is used to understand the dynamic, adaptiveness of systems and the individuals in them. Finally, improvement science is scientific because it has a common nomenclature (language) that creates a shared understanding. Terms and processes are conceptualized, operationalized, and defined.

Perla, Provost, and Parry (2013) show that improvement science is truly a science and, in our minds, worthy as a dissertation frame. Improvement science focuses on high-leverage problems that necessitate complex thinking. PDSA cycles align with the scientific method and their iterative cycles help educators build new knowledge, products, and processes. Improvement science is nested in traditions that respect local understanding, and it utilizes what is known about human thinking in complex systems. All of these ideas have led us to believe that improvement science would be a good framework for a practitioner's dissertation, or DiP. Still, we acknowledge that accepting improvement science as a scientific process can be challenging in doctoral programs. PhD dissertations remain the gold standard because they are fixed by centuries of tradition (Schuster & Finkelstein, 2006). CPED members are working to change this with innovative ideas about what dissertations mean and should look like (Archbald, 2008, 2010; Kennedy, Altman, & Pizano, 2018; Murphy, 2014a).

PhDs, EdDs, and Dissertations

> The ground of programs and degrees for educational practitioners, whatever the names or titles must be practice. (Murphy, 2014a, p. 24)

The blog Dissertation Hell (http://disshell.blogspot.com) is an online space where doctoral candidates can rant publicly and anonymously about the tortures they have encountered while writing a dissertation. The author created the blog to acknowledge her years of suffering. She, like so many, had reached ABD (All But Dissertation) status and in four years of trying to complete her dissertation only managed to write one chapter. She described the experience as being "incredibly distasteful" (PORKORAMA, 2004).

While not all experiences are bad and not all students blog about it, the fact that platforms like this exist is telling. Dissertations are the most rigorous process doctoral students face in their program

as well as the place where many of them fall down. In fact, the attrition rate in PhD programs in the United States has hovered around 50 percent (Cassuro, 2013; Council of Graduate Schools, 2009; Murphy, 2014b). It is a sad fact that many doctoral students complete their coursework but never finish their dissertations and remain ABDs. What is sadder is the lack of change across doctoral education to try and address this.

Why we need distinct dissertations

Attrition rates are dismal in higher education and because the dissertation is where many students fall down, it is worth wondering why. PhD dissertations are designed to transform the doctoral candidate into an academic who will research, teach, and serve their institution and their profession. Given this, PhD dissertations must be original (meaning not researched before), aimed at building or extending theory, and, in most cases, aligned with the major professor's expertise and research. PhD dissertations help students gain mastery of methodological, historical, topical, empirical, and theoretical concepts and in turn, become experts in a defined domain. Dissertation work prepares the PhD candidate to make a significant contribution to the scholarship in their field, earn tenure, and move up the ranks from assistant to associate to full professor (Murphy, 2014b; Nyquist, Woodford, & Rogers, 2004).

In contrast, EdD students are working professionals who want to get a degree and remain in the field. Given this, they want their degree and dissertation work to matter to their personal and professional goals and to the populations they serve (Perry, 2012a, 2012b, 2014, 2016; Shulman et al., 2006). EdD students want to gain the knowledge, skills, and dispositions they need to successfully raise up disadvantaged populations in educational organizations (Bryk, Gomez, Grunow, & LeMahieu, 2015b; Gomez, Russell, Bryk, LeMahieu, & Mejia, 2016). They want to understand the systems and processes that created inequities, learn how to use the mounds of data they receive to help their students learn better, and understand how to build consensus in politically charged times.

However, needs like these are not necessarily addressed through dissertation work. It has been difficult for higher education to let go of the status quo and consider new methods and dissertation frames. Two of the most difficult components to conceptualize and change in EdD programs are the culminating project and associated elements of research preparation (Perry & Abruzzo, in press). Long-standing traditions surrounding the teaching of research and the dissertation's appropriateness, form, content, and completion often preclude any discussion of innovation or alteration (Bengtson & Jones, 2014; Hochbein & Perry, 2013). However, thanks to innovators and advocates some programs are working toward making changes that support professional preparation.

New ideas for programs

Hochbein and Perry (2013) argue for distinct research training in EdD programs because practitioners do not go to graduate school to create new theories or find generalizable solutions but rather want to work in local contexts, change inequities, and use what they learn to solve PoPs. Hochbein and Perry (2013) note that these aspirations require different training and different dissertations. In their words, "Conceptualizing and addressing problems of practice requires a much different skillset than in a traditional dissertation" (Hochbein & Perry, 2013, p. 22). Scholarly practitioners need to learn to decipher existing knowledge and the validity of that knowledge, debate the need for reforms using existing research, and apply the findings of research literature in the design of practical and testable solutions to address pressing PoPs. These skills are vastly different than the skills PhD students need to become researchers or academics.

Such arguments back the notion that EdD programs need to be distinct from PhD programs, which requires new thinking and much change in schools of education. CPED has brought together members of schools of education since 2007 to work to distinguish the EdD as the professional degree in education. In 2014, in an effort to understand if CPED had been impactful, members conducted a

cross-case study of 21 of its original member institutions and found that all were working to distinguish their EdDs from their PhDs, to increase enrollment and graduation rates for practitioners, to change their degree structures including time to degree, and to make changes to their dissertations and their advising models. These EdD programs changed in terms of purpose and goals, the types of research preparation, and their reliance on cohort models as means of improving preparation and graduation. A few institutions in the study had started using group dissertations as a distinguishing factor that supported practitioner learning (Crowe, 2013; Perry, 2016; Perry & Imig, 2016; Perry, Zambo, & Wunder, 2015). A while later (2017–2018), more data were gathered from CPED Member Reports (n=53 institutions). These data showed that preparation for completing the culminating product, or the DiP, was woven throughout programs and coursework. Students began working on their dissertations early (often in the first course) and components of the product were added and refined as students traversed toward graduation. Additionally, 83% of respondents noted that self-selected PoPs were the central focus of DiPs and that these problems often focused on social justice, learning, behavior and motivation of students, and teacher development (Abruzzo, Carlins, Zambo, & Bowden, 2019).

Thoughts on EdD dissertations

Scholars have examined the utility of the dissertation for practitioners. For example Joseph Murphy says dissertations are "work that need not be done by those who should not be doing it" (2014a, p. 27). Murphy believes that dissertations corrupt leadership training because to do them, programs focus too much on academics (theory) instead of practice and problems. To Murphy, colleges of education overlook Dewey's essential theme of using educational practice to shape inquiry and action, instead of the other way around. Murphy expounds that education needs to situate scientific evidence in the ways data exist in schools. He suggests dissertations should be portfolio-like and focused on PoPs from clients, situated

in everyday work, and performed collaboratively instead of individually. He notes that EdD dissertations should be distinct from PhD dissertations in these three ways.

1. The PhD dissertation should be about specialization and becoming an expert in a defined domain of learning. In contrast, EdD students are generalists. Therefore, course- and dissertation-work should prepare them for this work.
2. The PhD dissertation honors writing for a career of publication, yet EdD students rarely write long narratives (80% of their work is interpersonal). The writing of school leaders bears little resemblance to the academic writing in a dissertation.
3. The PhD dissertation features the consumption of research articles and the conducting of an "original" piece of research, yet EdD students will rarely, if ever, read a research article (as defined by us) and will almost never conduct another research study in their careers (Murphy, 2014b).

Another scholar who has articulated the need to distinguish the EdD dissertations is Douglas Archbald (2014), who posed that problem-solving for organizational improvement should be the goal of culminating projects/capstones and that resulting products should be portfolio-like instead of book-like chapters. To Archbald (2014), capstones should have four qualities: (a) developmental efficacy, (b) community benefit, (c) stewardship of doctoral values, and (d) distinctiveness. He further explains that the writing of dissertations should demonstrate that EdD program graduates have the capability to make better decisions, change practice, and produce better results (Archbald, 2010).

The education field has strong advocates for changing the way research and dissertations are taught for practitioners. Change is happening across many schools of education and conversations about distinctions continue. Still, more work needs to be done as mindset and tradition are slow to change in academia.

Distinguishing the EdD Dissertation

> When the story of preparation is unpacked, it is the EdD students who are consistently damaged. (Murphy, 2014b, p. 25)

The quote above reminds us of the sordid past and confusion surrounding the EdD and its dissertations. Over the past 15 years, there has been a growing concern that the traditional 305+ page dissertation, completed at the end of coursework, does not serve the needs of doctoral students planning professional careers (Shulman et al., 2006; Willis, Inman, & Valenti, 2010). Historically, dissertations in EdD programs have often mirrored PhD dissertations. More recently, faculty from programs associated with CPED have been working collaboratively to define and transform their dissertations into *DiPs*, scholarly endeavors that impact a complex PoP (CPED, 2010). DiPs are different from traditional dissertations in that they focus on addressing PoPs through applied inquiry. They engage inquiry questions rather than research questions to define the role of research in practice. Inquiry questions are those that arise out of practice, are co-constructed, user-centered, focus on diversity, equity, and social justice, and are meaningful to the student and their professional context. Instead of an exhaustive literature review, DiPs have EdD students perform a shorter, targeted Reviews of Scholarly and Professional Knowledge to help name and frame problems using experiential and professional sources. This kind of review helps scholarly practitioners better understand the root and history of their problem, clarify their inquiry questions, find potential solutions, and uncover the best measures to use to understand the impact of their work. DiPs also focus on designing and implementing changes that improve or solve PoPs. That is, a change idea is implemented, data is collected on the results of the implementation, and decisions are made about how to move forward for continuous improvement. Results of the DiP work go beyond the dissertation committee and are often shared with those who can incorporate it into professional practice. Table 2 captures how *DiPs* should differ from PhD dissertations.

Table 2.2. How EdD DiPs Should Differ from PhD Dissertations

	PhD Dissertation	EdD DIP
Purpose	extend theory, discover something new	impact a complex problem of practice and self as leader
Questions	research questions—theoretical/academic within one's field or questions other researchers have not considered	Significant, high-leverage questions focused on complex problems of practice that are often framed around equity, ethics, and social justice—problems are user centered and compelling
Literature	comprehensive literature review—in depth review of the historical, contextual, or social foundation of the study	Review of Scholarly and Professional Knowledge—concise review blending professional, practical knowledge with scholarly knowledge to understand the problem, find solutions, and develop measures that will provide evidence of change (or not); scholarly knowledge is deciphered, debated, and used for solutions
Methods	quantitative, qualitative or mixed researcher is an outsider	practical measures and processes aimed at uncovering if the change is working (may be quantitative, qualitative, or mixed)
Analysis	by the researcher with some member checks	by the scholarly practitioner
Spread	published in peer-reviewed journals and presented at conferences	disseminated in various ways—communicated to stakeholders, published in professional and scholarly journals, and presented at conferences
Career	basis of an academic career—start of a publication record	advance professional knowledge and self as a leader

Improvement Science and the DiP

The idea of bringing improvement science into higher education started around 2012 when Anthony Bryk, President of the Carnegie Foundation for Advancement of Teaching, spoke to a group of CPED faculty members about how improvement science and Networked

Improvement Communities (NICs) could be new pathways for conducting research and development in education. At that time, Bryk posed the following questions:

1. What if cadres of EdD candidates across multiple institutions were working on a problem, or parts of a problem, in NICs?
2. What if CPED institutions served as supporting NICs, while also developing human and social capacity for this work to grow?

These questions led to much debate and some pioneer faculty beginning to investigate and teach improvement science in their EdD courses.

A while later, Ash Vasudeva (2017), Vice President of Strategic Initiatives at the Carnegie Foundation for Advancement of Teaching, continued the conversation with CPED faculty by asking them if their existing strategies, approaches and structures were sufficient for the next decade. In his words, "Is what *got* you here today enough to *get* you where you want to go tomorrow?" (Vasudeva, 2017, p. 2) To answer that question, Vasudeva brought up two ideas:

1. the tendency of schools of education to emulate traditional forms of academic research and scholarship; and
2. the tendency to less-than-adequately address the pressing needs of practitioners in schools and school systems, particularly those related to equitable opportunities and outcomes (Judge, 1982).

Both Bryk (2015) and Vasudeva (2017) have prompted further thinking about the role of inquiry in higher education and the change that is needed if practitioners are to be supported.

Building on the ideas from the Carnegie Foundation's promulgation of improvement science as a strategy to better address PoPs and CPED's definition of the DiP, we propose that improvement science be the signature methodology of the DiPs. The ISDiP, as we call it, moves beyond the DiP to offer a systematic methodology

and skillset for practitioners to use not only in their EdD program but also (and more importantly) in their professional practice. The ISDiP teaches students to become scholarly practitioners by offering them the skills to:

1. identify an actionable PoP in a local education setting in which the student currently serves;
2. develop a change that is based on the student's professional knowledge along with the best scholarship available;
3. implement and study the change effort systematically and methodically through a disciplined 90-day cycle; and
4. Report findings to both local stakeholders, the doctoral committee, and when appropriate, beyond to other professionals.

In general, the purpose of the ISDiP is to report the consequences of a particular educational improvement effort. The ISDiP is *not* undertaken to develop theory or fill gaps in the knowledge base of a discipline. The image below provides a visual of our idea of an ISDiP.

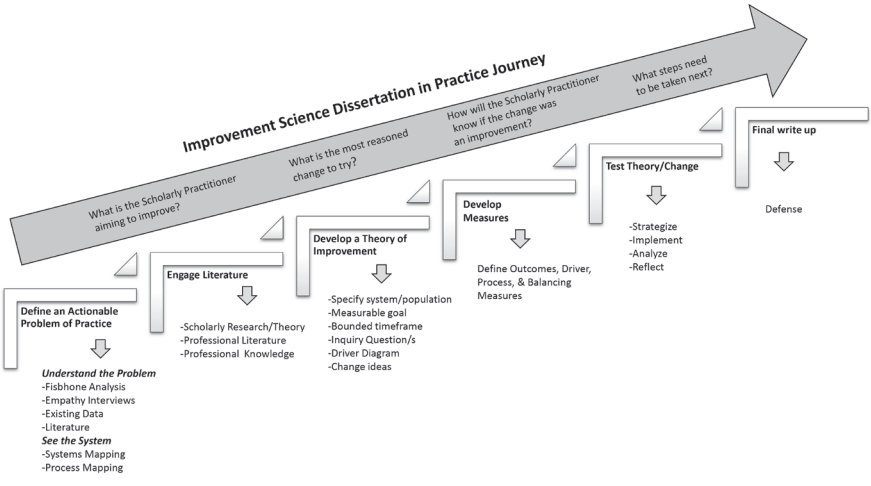

Figure 2.1. ISDiP Journey

In the remainder of this chapter, we provide a brief description of each part of the ISDiP, which form the basis for the rest of the chapters in this book.

Define an actionable PoP

As many of us know, it is important to take time to identify and understand the causes of complex problems before taking any steps. For EdD students, we call such problems actionable PoPs (Mintrop, 2016). The identification process means naming and framing a PoP, or 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, 2010). To be actionable means that the problem is within the student's sphere of influence (Mintrop, 2016). Another way to think about an actionable PoP would be to consider the Carnegie Foundation's definition of a high-leverage problem, which is one that 1) consumes substantial resources, 2) has potential for variable outcomes, and 3) if addressed would result in better efficiency and/or effectiveness (Bryk, et al., 2015). However, identifying this type of problem can be challenging (Mintrop, 2016). Students often bring solutions rather than specific problems, but tools like fishbones and systems maps can help to shift the focus back to the problem (Bryk, et al., 2015). Chapter 3 will explain how to find actionable problems using tools like these.

Engage literature

EdD students have a wealth of practical knowledge and because of this, they need to engage with literature differently than PhD students. Instead of writing an exhaustive review of literature that covers the history of their problem, scholarly practitioners write reviews that are targeted, selective, practical, and relevant to their improvement effort. Literature is blended with their practical knowledge and used to improve their leadership capabilities. They decipher the literature, debate its applicability for their own contexts, and apply

findings in the design of practical and testable solutions to address pressing PoPs (Hochbein & Perry, 2013). Scholarly practitioners writing ISDiPs use literature to:

- link their problem to universal problems that have been empirically studied;
- justify why their problem matters to practice and to them;
- document what is known (and not known) about the problem in other contexts;
- identify theories that inform the change effort;
- gain models for measures, analysis, and interpreting results; and
- enrich their professional and practical knowledge.

Chapter 4 provides more insight into the use of literature in an ISDiP.

Develop a Theory of Improvement

A Driver Diagram is an improvement tool that visually represents the student's working theory of improvement and creates a common language and vision to coordinate efforts among individuals (Bryk, 2018; Bryk, et al., 2015; Milder & Lorr, 2019). It is based on the student's goals for improving their PoP, the identification of leverage points in their system where change might be possible, and the posing of potential solutions to improve not only the problem but the organizational system. Driver Diagrams contain an aim, primary drivers (hypothesis on what to target), secondary drivers (sub-hypothesis), and change ideas. The use of Driver Diagrams in developing a working theory of improvement will be further explained in Chapter 5.

Develop measures

> We cannot improve at scale what we cannot measure. (Bryk, et al., 2015, p. 87)

The next step in the ISDiP process is to develop and explain the measures that will be used to determine if a change was an improvement. The quote above from Byrk, et al., (2015) suggests that this step has many components. Improvers know that measures are the "north star" in any effort and that you cannot improve something if you cannot measure the visible change (Bryk, et al., 2015). Explaining measures needs to be explicit. Each measure must be clearly described including why the particular measure will be used, how it will be used, and how it will be analyzed. Measures for improvement should be transparent, rigorous, and fit into the everyday workings of the context where the PoP is situated. Measures for improvement are used to answer four questions:

1. Is the change working? (driver measures)
2. How is it working? (process measures)
3. Is it working as intended? (balancing measures)
4. Did it work? (outcome measures) (Hinnant-Crawford, 2019)

These questions illustrate how measurement for improvement does not provide data to develop grand theories or generalizable results. Measurement for improvement is culled from the work of practice and fits into it instead of the other way around (Murphy, 2014b). Chapter 6 will provide more insight into these ideas.

Test the theory/change

Testing the change idea is often the most exciting part of the ISDiP for students because this is the time when they get to apply all that they have learned to change their PoP. Testing is undertaken utilizing a 90-day cycle, which, for the ISDiP, we envision as strategizing (S), implementing (I), analyzing (A), and reflecting (R). Implementing a 90-day cycle requires flexibility and strong leadership skills to ensure success. Chapter 7 will explain more.

Summary

Building on ideas from Chapter 1, this chapter has extended the notion of developing scholarly practitioners who work as translational researchers, individuals who, through inquiry into their practice, bridge the theory to practice divide. This chapter also explained that improvement science is a science that uses the scientific method and relies on psychology, systems theory, and pragmatism. We have married improvement science with the DiP to present a visual framework for how improvement work is designed and performed as part of an EdD program. Performing improvement science for dissertation work develops in the practitioner the knowledge, skills, and habits necessary to lead the changes our schools and organizations need. The experience also produces practitioner-generated professional knowledge.

Post-reading questions for faculty

1. Think about your dissertations. How is the work performed? What do your students learn by doing this work? What happens to the work once the dissertation is defended?
2. How would your answers to the above questions differ if your students did an ISDiP?

Post-reading questions for scholarly practitioners/students

1. How is improvement science scientific and how could it be used as a dissertation frame?
2. This chapter provided insight into translational researchers. Describe how this idea aligns with your professional goals. Why would an ISDiP make you better at bridging the theory to practice divide?

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