

CATALYZING LEARNER-CENTERED EDUCATION:
USING AN ACTION RESEARCH PROFESSIONAL LEARNING COMMUNITY TO
CULTIVATE LEARNER-CENTERED INNOVATION IN CLASSROOMS

by
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Abstract

Learner-centered educational approaches are conceptualized as being more effective for meeting the needs of 21st century students than conventional approaches to teaching and learning. Despite students' changing needs, learner-centered education has not become the predominant approach in public education. This dissertation describes a multiphase research study focused on identifying and addressing the needs of K-12 teachers tasked with operationalizing learner-centered approaches in a small school district in eastern Pennsylvania. A review of the literature highlighted many factors influencing their pedagogical decisions. These included societal factors such as government policy, context-specific factors such as organizational culture and climate, and individual characteristics of teachers such as perceived professional identity. This collection of factors informed the development of a needs assessment that identified the salient factors influencing the decision-making processes of the teachers in this study. Based on the results of the needs assessment findings, a professional learning experience was developed with the goals of helping participating teachers collaboratively engage in sensemaking processes to better understand learner-centered education and create their own learner-centered innovations to cultivate teacher self-efficacy. A quasi-experimental convergent parallel mixed methods pretest-posttest research design was utilized to identify key outcomes. Participation in the professional learning experience was found to support participants in the process of operationalizing learner-centered education. These findings suggest action research embedded in a professional learning community can be effective for supporting teacher sensemaking processes and increasing teacher self-efficacy, particularly with regards to catalyzing learner-centered innovation in classrooms.

Keywords: learner-centered education, innovation, sensemaking, self-efficacy





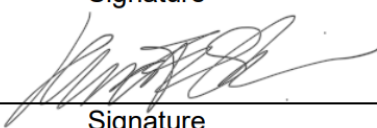
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Dedication

This dissertation is dedicated to the people (and pets) who helped me stay grounded and made me feel loved throughout the up-and-down, intense process of completing this doctoral program: my wife, Danielle; my mom and dad, Paula and Andy; my brother and soon to be sister-in-law, Jake and Claire; the O'Connor family, Mike, Kathy, Courtney, and Kirsten; all of my friends and extended family; and Sebastian, my study buddy, at least when I bribed him with treats.

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Executive Summary

Many conceptualize current societal changes as a shift from the industrial age to the information age, which necessitates new approaches to teaching and learning (Reigeluth, 1992; Sawyer, 2014; Wrigley & Straker, 2017). Learner-centered education (LCE) is understood as an approach to teaching and learning that can modernize conventional schooling and better prepare students for life in the 21st century (An & Reigeluth, 2011; Papert, 1993; Rose, 2016; Watson & Reigeluth, 2008). The focus of this dissertation was two-fold. The first focus was identifying the needs of teachers in a small Pennsylvania K-12 school district as they sought to operationalize LCE in classrooms. The second was to develop a professional learning (PL) experience that would address these teachers' needs and allow them to expand their use of learner-centered approaches. The resulting intervention study was designed to support teachers through the sensemaking process (Weick, 1995) of understanding LCE and build their self-efficacy (Bandura, 1986) for developing and implementing learner-centered innovations.

Problem of Practice

Operationalization of LCE has progressed slowly across the country (Gross et al., 2018). This slow pace of progress has withstood attempts to accelerate the adoption and diffusion (Rogers, 2003) of LCE. Existing supports include the development of non-profit organizations such as Education Reimagined (<https://education-reimagined.org/>) and The Aurora Institute (formerly iNACOL) (<https://aurora-institute.org/>), initiatives from the federal government such as funding incentives via the Race to the Top program (2009) and ratification of the Every Student Succeeds Act (2015), and state government bills and programs such as those in Vermont and Ohio supporting competency-based learning.

As noted, however, these supports have not increased the adoption rate of LCE to the desired pace. As 21st century life continues to change, it is possible that the gap between student needs and the skills they develop in school could continue to widen despite these existing LCE adoption efforts. This problem was evident in the needs assessment conducted for this dissertation in a small K-12 school district in Pennsylvania, where actions taken on the administrative level to support the adoption of LCE had not translated to meaningful shifts in classroom practices.

Factors Influencing Widespread Adoption of Learner-Centered Innovations

A review of the academic literature revealed numerous and complex factors that influence educational practices in schools and classrooms. For this literature review, the factors were organized using the networked model of ecological systems theory (EST; Neal & Neal, 2013) and Weick's (1995) theory of organizational sensemaking. As such, factors in this literature review were grouped by system level, including factors stemming from macrosystemic and microsystemic levels, as well as characteristics of individual teachers. Teachers were the focal individuals in this conceptualization of networked EST as they are the primary decision-makers in the classroom and, therefore, have the most direct influence on processes of teaching and learning. Characteristics of individual teachers were considered in addition to systemic factors in order to better understand what individual factors influence teachers' interpretations of teaching and learning, particularly LCE.

The review of the academic literature resulted in the creation of this study's conceptual framework, in which factors were categorized into four groupings: (a) chronosystem and macrosystem levels were combined to include all large-scale sociocultural and sociopolitical

factors; (b) mesosystem factors included all interactions across stakeholder groups, such as administrators and teachers; (c) microsystem factors included teacher interactions with teaching colleagues and classroom communities; (d) individual teacher characteristics identified as influencing their sensemaking including professional identities and past professional experiences. This framework supported the design and implementation of a needs assessment study to identify how to best support teachers in the process of operationalizing LCE in their classrooms.

Context of Study and Needs Assessment Findings

The context of this dissertation study was a small, K-12 public school district in eastern Pennsylvania. According to the American Community Survey – Education Tabulation (ACS-ED) conducted by the National Center for Education Statistics (NCES), as of the 2019-2020 school year, there were 1584 total students, 416 (26%) of whom had individualized education programs, and an overall student-teacher ratio of 13.87 (NCES, 2020). The district’s learner-centered vision of teaching and learning was represented in two documents, the Profile of Graduate (PoG) and Learning Beliefs (LBs). Two notable changes in the district preceded the needs assessment study and likely influenced implementation of the district vision. First, financial hardship for the district resulted in the consolidation of two elementary schools into one, reducing the total number of full-time teachers in the district. Second, the widespread and localized impact of the COVID-19 pandemic impacted teaching and learning due to necessary shifts to virtual and hybrid education models.

The needs assessment study was designed to identify a variety of factors influencing teachers’ pedagogical decisions, including (a) policies and messaging teachers received from

other district stakeholders, (b) the degree of learner-centeredness of teachers' beliefs and practices, and (c) teachers' perceptions of the district context and how their professional identities were aligned or misaligned with the learner-centered vision.

Needs assessment research questions included:

- RQ1: How do policies, plans, and other messages from district stakeholders (i.e., school board, district administrators, and building administrators) support or hinder teacher operationalization of the district vision?
- RQ2: To what extent do teachers hold learner-centered beliefs and utilize learner-centered practices in their classrooms?
- RQ3: How do teachers perceive their professional context and their professional roles and identities, particularly in light of the district's vision for teaching and learning?
- RQ4: How do these data strands converge, diverge, and supplement each other?

The needs assessment utilized a mixed methods design (Creswell & Plano Clark, 2017; Teddlie and Tashakkori, 2003) that included a document analysis, quantitative survey, and teacher interviews. The document analysis was used to answer RQ1, the quantitative survey answered RQ2, and the interviews were used to answer RQ3. RQ4 was answered by integrating the data from all three data strands.

The document analysis revealed a total of seven documents or document sections that were aligned with LCE, four that were neutral, and four that were misaligned. In the first part of the survey, which focused on teachers' beliefs, almost all participant responses indicated partial agreement (61.0%) or strong agreement (33.8%) with learner-centered beliefs. In the second part of the survey, none of the 176 item responses indicated a teacher "Never" utilized one of the

learner-centered classroom practices listed on the survey. The six themes that emerged from the qualitative analysis of teacher interviews ranged in focus from the varied and often competing messages and directives teachers received from stakeholders to suggestions these teachers had for how they could better be supported through the process of operationalizing the district's vision.

The key conclusions of the needs assessment were: (a) teachers' practices fell along a continuum between conventional and learner-centered orientations, but no participants felt they had fully realized the district vision; (b) participants' use of learner-centered innovations were influenced by their professional networks, their own personality and beliefs, and their understanding of and stress response to the district vision; (c) participating teachers needed guidance, time, opportunities to collaborate, and first-hand experiences in learner-centered classrooms to advance their operationalization efforts. These findings informed the development of the PL intervention intended to support district teachers in the process of operationalizing LCE.

Theoretical Framework

Sociocultural theory (Vygotsky, 1978) and self-efficacy theory (Bandura, 1986) were used as the theoretical framework for the intervention study. Sociocultural theory highlights the social, experiential nature of learning, and self-efficacy theory conceptualizes the processes by which individuals can develop self-efficacy, an individual's domain-specific belief in their ability to complete desired tasks.

Both theories have previously been applied in educational contexts. Based on sociocultural theory, Raphael et al. (2014) propose five key principles of

socioculturally-informed PL: (a) learner agency, (b) contextualized, authentic learning, (c) collaborative discussion, (d) a systems-orientation, and (e) a significant timeframe. Based on self-efficacy theory, Tschannen-Moran & Chan (2014) conceptualize teachers' self-efficacy beliefs as playing a role in teachers' action or inaction regarding curriculum reform, such as the operationalization of LCE.

The development of this theoretical framework concluded with the integration of theories into a conceptualization of an effective approach to professional learning. In this framework, sociocultural learning approaches, as proposed by Raphael et al. (2014), would allow for the development of teachers' self-efficacy and cultivate participant experimentation with learner-centered innovations.

Review of Approaches to PL Interventions

A review of the academic literature about teachers' professional learning revealed a collection of best practices and formalized approaches to PL that aligned with the theoretical framework. Empirically supported best practices included active learning, collaboration, and connection to teachers' actual professional contexts of their classroom and schools. Through the lens of the theoretical framework, these practices were understood to be primarily sociocultural, as they were social and experiential, which in turn provided opportunities to develop the self-efficacy teachers needed to develop innovative classroom practices. Formalized approaches that reflected these best practices were lesson study and the improvement science approach of plan-do-study-act (PDSA) cycles.

Lesson study is a highly structured approach to PL that can be used to explore new approaches to education in addition to identifying new curricular content and sequencing (Hart et

al., 2011). Lesson study involves (a) a group of teachers determining an area of need in student learning, (b) the collaborative development of a research lesson, (c) the implementation, by one member of the group, of the research lesson, and (d) collaborative reflection on the research lesson and how it could be improved in the future (Hart et al., 2011; Lewis & Tsuchida, 1998; Vermunt et al., 2019).

Improvement science is a systematic, design-oriented approach to enacting change. It is often enacted through iterative implementation, reflection, and revision in the form of PDSA cycles (Bryk et al., 2015). In the “Plan” phase, participants are asked to reflect on questions about the goals of the improvement science process and ways to achieve those goals (Christie et al., 2017). The next three phases focus on the implementation of the plan, analysis of the results, and a determination about how to proceed (e.g., revise the approach or permanently incorporate it into the context).

This review of the literature, in conjunction with the needs assessment findings, led to the initial development of a PL experience. This plan centered around the creation of an action research-oriented professional learning community (PLC; Jacobs & Yendol-Hoppey, 2014), in which participating teachers would work together to learn about and apply the district’s learning beliefs in their classrooms through the development of learner-centered innovations. The action research component of the PL experience was based on the PDSA cycles of improvement science, rather than lesson study, due to the comparatively greater flexibility afforded in implementing the improvement science approach. This approach was understood to be effective in helping teachers operationalize the district’s learner-centered vision by utilizing the principles

of sociocultural learning to cultivate opportunities to develop their self-efficacy and lead to ongoing experimentation with learner-centered innovations.

Intervention Study

The final design of the PL experience included four whole-day sessions that were spread over a two month timeframe. Each session emphasized a specific goal for participants' professional learning. The focus of Session One was evaluating student progress on the district PoG. Session Two focused on participants brainstorming ways in which they could utilize the district LBs to improve student growth regarding PoG competencies. Session Three explored using action research to develop and experiment with learner-centered innovations. Finally, the focus of Session Four was to reflect on participant experiences and determine next steps following the conclusion of the PL experience. The PL experience included numerous activities, including observations of model classrooms, collaborative development of definitions of concepts and terms listed on the district's vision documents, and participants' individual development of learner-centered innovations they could use in their classrooms.

Purpose and Research Questions

Four goals guided the intervention study. The first goal was to contribute to the academic scholarship regarding teachers' professional learning. The second goal was to advance approaches to the operationalization of learner-centered education. The third goal was to help teachers in the district transform their thinking about learner-centered education and their roles as teachers in learner-centered contexts. The fourth goal was to help teachers bring the district's learner-centered vision to life in their classrooms. These goals were used to frame the development of research questions to support evaluation of the implementation process as well

as the outcomes of the PL experience for participants. Research questions tied to process evaluation included:

- RQ1: Are adequate resources available and being used to support ongoing intervention implementation and, if not, which resources are limited?
- RQ2: To what extent are intervention activities being adhered to by participants?
- RQ3: To what extent do participants express satisfaction or dissatisfaction with the program and perceive benefits to their professional growth?

Research questions tied to outcome evaluation included:

- RQ4: To what extent does action research embedded in a professional learning community increase teacher self-efficacy?
- RQ5: How does action research embedded in a professional learning community change teachers' perceptions of learner-centered education and its operationalization in their classrooms?

Research Design

This study utilized a quasi-experimental convergent parallel mixed methods pretest-posttest research design (Creswell & Plano Clark, 2017; Shadish et al., 2002), in which participants from the population of district teachers volunteered to join the PL experience. The design did create the potential for selection bias (Rossi et al., 2019; Shadish et al., 2002), as teachers who volunteered to participate were likely more interested in innovative teaching practices than the general population of teachers in the district. Despite the threat of selection bias, the research design was chosen because a quasi-experimental design was determined to be more feasible and ethical than an experimental design for social science research (Henry, 2010;

Shadish et al., 2002), and a convergent mixed-methods approach to data collection and analysis was selected to provide complementary data strands that would allow for a more nuanced understanding of the outcomes of the intervention (Creswell & Plano Clark, 2017).

Data and Analysis

Instrumentation included a resource availability checklist, mixed model (Teddlie & Tashakkori, 2003) process evaluation and outcome evaluation questionnaires, and a culminating focus group.

Process Evaluation

Process evaluation variables included resource utilization, adherence, and participant responsiveness (Baranowski & Stables, 2000; Dusenbury et al., 2003). The resource availability checklist was completed by the facilitator immediately prior to each session, and was reviewed for accuracy after the final session. The process evaluation questionnaire was administered at the conclusion of each PL session.

Outcome Evaluation

Outcome evaluation variables included teacher self-efficacy and participant sensemaking. The outcome evaluation questionnaire was administered at the beginning and end of the intervention in accordance with the pre-posttest design. This questionnaire included quantitative items adapted from the short form of the Teacher Sense of Efficacy Scale (TSES) developed by Tschannen-Moran and Woolfolk Hoy (2001). The culminating focus group occurred at the end of the final PL session and was used to gather rich qualitative data on both outcome variables, teacher self-efficacy and sensemaking. Due to the semi-structured design of the focus group, participant responses also provided additional data pertinent to the process evaluation.

Outcomes

Results and findings indicate that action research embedded in a PLC, specifically this intervention design, can lead to meaningful increases in teacher self-efficacy. This conclusion was drawn from both questionnaire and focus group data that suggests participants became more confident in their general teacher self-efficacy as well as their confidence in their ability to operationalize LCE over the course of the intervention. The results and findings also indicate that this approach to professional learning can support teachers' sensemaking processes of LCE. Specifically, analysis of the questionnaire and focus group data suggests this approach allowed participants to gain deeper understandings of LCE and shift their mindsets regarding LCE and the process of operationalization.

Several noteworthy implications emerged from the study. First, the findings reinforce the applicability of sociocultural and self-efficacy theories in designing PL experiences. Second, the findings highlight practical implications such as the value of creating a school-within-a-school (SWS) to develop innovative practices, the potential of using consistent and small steps to create significant pedagogical change, and the importance of providing teachers with the time and support necessary to adjust to novel educational approaches.

Chapter 1

Problem of Practice

Life in the 21st century is changing at a rapid pace. Disruptive technologies are emerging on what can feel like an everyday basis. From Uber and Netflix to societal changes such as the work-from-home boom, it is clear that society is experiencing a seismic shift. This drastic change is often conceptualized as a shift from the industrial age to the information age, a shift that necessitates and allows for new ways of educating students to better prepare them with the skills and dispositions needed for modern life (Reigeluth, 1992; Sawyer, 2014; Wrigley & Straker, 2017). In contrast to the traditional standardization or instructionist approach to education in the industrial age (Papert, 1993; Rose, 2016), learner-centered education has emerged as an innovative paradigm of education (An & Reigeluth, 2011; Watson & Reigeluth, 2008) informing the design of education models that address these new student needs and infusing principles and best practices from humanism, constructivism, and the learning sciences (Cornelius-White, 2007; Henson, 2003; McCombs & Whisler, 1997; Reigeluth et al., 2017). Because most learner-centered models are still relatively new, there is limited empirical research on their efficacy (Bingham, 2016). Still, early results on the affective and cognitive effects on students are promising, particularly for those students who have traditionally been underserved (Alfassi, 2014; Pane et al., 2017). Additionally, the few long-standing learner-centered models, such as Montessori schools, give us a glimpse into the potential positive effects of such models in general (Lillard & Else-Quest, 2006).

As the learner-centered paradigm continues to spread across the country, a variety of large-scale supports have been implemented to cultivate its continued diffusion. Many

organizations, including Education Reimagined (<https://education-reimagined.org/>), The Aurora Institute (formerly iNACOL) (<https://aurora-institute.org/>), LEAP Innovations (<https://www.leapinnovations.org/>), and NextGen Learning (<https://www.nextgenlearning.org/>) have emerged as major proponents of learner-centered education and the systemic redesign of schools and classrooms. The federal government has also supported the shift toward personalized, learner-centered education through the Race to the Top (2009) funding initiative and ratification of the Every Student Succeeds Act (2015). Some states, including Vermont, New Hampshire, and Rhode Island, have passed legislation on personalized learning, while other states, including Ohio, Florida, and Illinois, have been piloting competency-based learning programs, a vital stepping stone to fully personalized models that align with the learner-centered paradigm (Gross et al., 2018). It appears, however, that nationwide progress has been limited to this point. Despite the changing needs of students in the 21st century, the noted positive results of implementation, and supporting organizations and policy, operationalization of the learner-centered education paradigm and aligned school and classroom models has progressed slowly in schools across the country (Gross et al., 2018).

This issue is evident in a small, suburban school district in eastern Pennsylvania. Since starting my work there five years ago, my role has been as a middle school English, Social Studies, and Gifted support teacher. I have also been tasked over this time with developing a learner-centered school-within-a-school (SWS) to serve as a proof of concept of a scalable learner-centered model that could be used or adapted throughout the district. The idea for this program, now in its fourth year of operation, was initiated by the principal of the district middle school. In addition to my own role in developing the SWS, two other middle school teachers

have been essential in its development and operation. In this program, we emphasize learner agency and engagement, cultivating those experiences for students through experimentation with a variety of education innovations. For example, we have developed a competency-based curriculum for grades 6-8 in the subjects of science, math, social studies, and language arts, which we developed with the Canvas Learning Management System (<https://www.instructure.com/canvas>). This approach to curriculum design allows students to choose which subject and assignments they want to work on, and they are able to develop cross-disciplinary projects to demonstrate their mastery as well.

The district's push to operationalize learner-centered education began seven years ago, when the district developed its vision of teaching and learning. This vision is reflected in two documents: the profile of a graduate (PoG) and learning beliefs (LBs). The PoG represents what district stakeholders believe are the most important literacies, dispositions, and competencies for students to develop while enrolled in the district to be prepared for 21st century life. Development of this document was initiated by the district administrative team but was shaped in collaboration with various stakeholder groups (e.g., students, parents, teachers, building administrators), all of whom provided input for the project. The LBs were adopted from the work of Education Reimagined (<https://education-reimagined.org/>) after district administrators identified these learning beliefs as an effective means of communicating learner-centered educational practices to stakeholders, particularly the teachers who would be utilizing these practices in classrooms. These five learning beliefs, or principles, are (a) competency-based, (b) learner agency, (c) open-walled, (d) personalized, relevant, and contextualized, and (e) socially embedded. Since the district vision was developed through the PoG and LBs, there has been

administrative support for teachers to make the optional innovation-decision (Rogers, 2003) to transform their classrooms to align with this vision and the learner-centered paradigm of education more broadly.

Despite this support, operationalization of the district vision has progressed slowly, with the exception of the developments occurring in the SWS. Some teachers are making efforts to incorporate more learner-centered practices, but the kind of grand change envisioned by administrators has not materialized. My perception as a teacher in the district is that there is little incentive to enact the kinds of deep, learner-centered changes envisioned by administrators, and most teachers spend little time in their daily work learning more about the LBs or considering how they could be operationalized. In general, the district may be viewed as a microcosm of the current state and evolution of learner-centered, personalized practices throughout the United States as both this school and the nation are in the early stages of experimenting with learner-centered education systems.

Understanding Learner-Centered Education

As a paradigm of thought, learner-centered education can be difficult to concisely define, particularly in a way that draws consensus from those involved in learner-centered education (Lattimer, 2015). In order to better grasp what someone may mean when they say “learner-centered,” we must be familiar with its historical context, philosophical roots, and a range of different but overlapping conceptualizations. Before proceeding, there is an important note about terminology: although personalized learning has developed more recently, based on a review of the literature, the terms “learner-centered,” “student-centered,” and “personalized learning” are often used interchangeably. For this review, “learner-centered” is the preferred

term, particularly because personalized learning sometimes, but not always, refers to rigid, pay-to-use learning models that do not align with the learner-centered paradigm.

Historical Context and Philosophical Roots

The structures and practices of our education system, what Tyack and Cuban (1995) call the “grammar of schooling,” were devised over one hundred years ago and still exist today in essentially their original form (Cohen et al., 2018; Ertmer & Newby, 2013). The existing model of public education is so universal and has been the schooling experience of so many individuals that it has become ingrained in the public consciousness and is now generally assumed to be the correct model, even inevitable (Tyack & Cuban, 1995). Despite its ubiquity, this model was designed in a different historical context with goals that do not align with the needs or goals of modern society (Reigeluth, 1992).

This schooling system was conceived by industrialists and policy elites, using principles of scientific management at the turn of the 20th century as America was transitioning from an agrarian to industrial economy (Rose, 2016; Tyack & Cuban, 1995). Its primary purpose was to efficiently sort children into categories perceived to fit their innate abilities and future career paths. There was a notable fork in the road between those deemed management material and those whose primary responsibilities were conceived as following orders on the assembly line (Reigeluth, 1992; Rose, 2016).

The artifacts of decisions made a century ago, the “grammar of schooling,” include features such as sorting students into age-based grades, the siloing of learning into isolated content areas, and the parallel isolating effect of solitary teachers in classrooms (Tyack & Cuban, 1995). These artifacts have left us with a highly structured schooling experience that is linear,

compartmentalized, and bound by strict time requirements (Alfassi, 2004; Reigeluth, 1992). Some argue that this education model promotes hierarchical power structures, resulting in authoritarian classrooms and complicated bureaucratic environments that make it difficult for teachers and students to form meaningful relationships (Alfassi, 2004; Reigeluth, 1992). Although the industrial-age principles of efficiency and standardization prevailed as the guiding concepts for our public education system, there has always been a concurrent line of thinking. Some of those who have contributed to the modern conceptualization of learner-centered education include notable 20th century thinkers in the disciplines of psychology and education, including John Dewey, Jean Piaget, Lev Vygotsky, Carl Rogers, and Paulo Friere (Cornelius-White, 2007; Keiler, 2018; Lattimer, 2015).

The earliest lines of thought that contribute to the modern conceptualization of learner-centered education are humanistic approaches to teaching and learning (Cornelius-White, 2007; Rose, 2016). In addition to its humanistic roots, the learner-centered paradigm of education is built on the epistemology of constructivism (Henson, 2003; Keiler, 2018). As a divergence from the positivist or post-positivist epistemology that informed development of the traditional education model, constructivism was first adopted by those involved in research and development of the learning sciences (Sawyer, 2014). It emphasizes the individualized and social nature of knowledge construction (von Glasersfeld, 2005) as well as the situated, experiential nature of learning (Cobb & Bowers, 1999). At its core, constructivism implies that learning is more complex than traditional education systems would lead one to believe; rather than knowledge being delivered by the teacher to the student, knowledge is created by the student through the development of complex and personal conceptual connections and activity.

Common Principles of Learner-Centered Education

Although the learner-centered paradigm is difficult to define, there are common principles across the academic literature that can help inform school and classroom design. By identifying and synthesizing a variety of descriptions in the literature, one may start to consider these principles. In order to determine these emergent principles, I reviewed a variety of descriptions and frameworks of learner centered education (Alfassi, 2004; An & Reigeluth, 2011; American Psychological Association, 1993; Bingham et al., 2018; Colley, 2012; Cornelius-White, 2007; Education Reimagined, 2015; Henson, 2003; Keiler, 2018; McCombs & Whisler, 1997; Mostrom & Blumberg, 2012; Reigeluth et al., 2017; Schweisfurth, 2015; Weimer, 2013) and synthesized them into the following five principles. This list is not meant to be exhaustive, but rather a starting point for building a shared understanding; although some involved in learner-centered education might note omissions in this list, it is doubtful that many would disagree with the principles included.

Principle #1: Learning is Personalized to Account for Student Individuality

Personalization generally refers to customizing students' learning experiences in order to promote their growth (Bingham et al., 2018) and acknowledge how one's unique collection of qualities and experiences impacts their learning (American Psychological Association, 1993). Personalization with regard to the whole child, rather than just academic learning, could be considered the hallmark principle of learner-centered education (Alfassi, 2004). In the literature, a wide variety of individual characteristics are identified in the rationale for personalizing the learning experience, including differential adolescent development across the domains of the physical, intellectual, emotional, and social, differences in student learning strategies, past

experiences, heredity, linguistic background, sociocultural background, perspectives, talents, capacities, needs, dispositions, perceptions, and goals (An & Reigeluth, 2011; American Psychological Association, 1993; Henson, 2003; McCombs & Whisler, 1997). In a learner-centered environment, these individual differences are not just tolerated, but embraced (Alfassi, 2004; Cornelius-White, 2007).

The implications for personalization in classrooms include helping students personalize goals, task environments, pacing, scaffolding, assessment, and reflection, as well as ensuring new concepts are being linked to learners' previous knowledge and experiences (American Psychological Association, 1993; Colley, 2012; Education Reimagined, 2015; Reigeluth et al., 2017; Schweisfurth, 2015). Another implication of personalization is that students are not necessarily grouped by age or forced to learn at the same speed as their peers, since each child develops and learns at their own pace (Alfassi, 2004; Reigeluth et al., 2017). Some sources also reference the use of mastery-based or competency-based grading (Education Reimagined, 2015; Reigeluth et al., 2017), which is a way of restructuring assessment that allows for personalized pacing and demonstrations of student learning.

Principle #2: Learning is Situated in Authentic Experience

Situated learning is a constructivist, research-based (Brown et al., 1989) approach to learning that involves contextualizing the learning process in learning communities that closely mirror the authentic activities in which those communities participate (Cobb & Bowers, 1999). The American Psychological Association's (APA) principles (1993) focus on the importance of experiential learning in general, but other sources emphasize that these experiences should not only be hands-on, but authentic by mirroring activities and goals that exist outside of the

classroom context, giving students a sense of how this learning is applied in real-world situations (An & Reigeluth, 2011; Henson, 2003; Reigeluth et al., 2017). The social and collaborative nature of learning is another key element of ensuring learning is situated and authentic (An & Reigeluth, 2011; APA, 1993; Education Reimagined, 2015; Weimer, 2013).

Principle #3: Educators Focus on Holistic Student Growth, Including Development of Transferable Skills and Dispositions

In learner-centered education, helping students develop skills and dispositions is an essential goal, in line with the humanist ideal of holistic development (Cornelius-White, 2007). One example of a comprehensive list of skills and dispositions is that put forth by Education Reimagined (2015), which includes skills such as critical thinking, collaboration, and problem solving, as well as dispositions including agency, curiosity, adaptability, and leadership. Many of the essential skills referenced in the literature emphasize transferability and creative, critical thinking (Cornelius-White, 2007), with a particular emphasis on self-regulated learning and the related concept of metacognitive thinking (An & Reigeluth, 2011; APA, 1993; Education Reimagined, 2015; Weimer, 2013). A commonly discussed approach in the literature is the repurposing of student assessment as a tool to help students learn and engage in metacognitive reflection (An & Reigeluth, 2011; Education Reimagined, 2015; Schweisfurth, 2015).

Principle #4: Educators Create Conditions That Maximize Positive Student Experiences and Affective Responses

Learner-centered education involves great consideration of the affective domain in the learning process. Some authors have emphasized the importance of creating a safe and comfortable classroom environment (Colley, 2012; Henson, 2003), while others have focused on

the importance of providing emotional support (An & Reigeluth, 2011) and creating a culture of mutual respect between the teacher and students (Schweisfurth, 2015). The APA emphasizes that motivation influences how much is learned, particularly by aiding the kind of sustained attention necessary for learning complex skills and ideas (APA, 1993). Some researchers have identified the teacher's role in cultivating student motivation and engagement (Mostrom & Blumberg, 2012) and suggest strategies including designing lessons to maximize engagement (Schweisfurth, 2015), sharing responsibility with students (Colley, 2012; Weimer, 2013), and other strategies backed by the most current research on motivation and learning (McCombs & Whisler, 1997).

Principle #5: Traditional Classroom Roles and Power Structures are Inadequate

The traditional conception of the teacher as the “sage on the stage” and students as passive recipients of knowledge is eliminated in a learner-centered context. As Colley (2012) states, “the focus is less on the teacher and more on the learning process” (p. 299). Moreover, traditional power structures, in which the teacher makes most, if not all, of the decisions for students, are also eliminated as teachers take on the primary roles of facilitator and coach (Mostrom & Blumberg, 2012). In conjunction with the shifting roles of teachers, students are given the opportunity to take ownership and express their ideas to inform the learning process (Cornelius-White, 2007). Due to the personalized nature of learner-centered education, each learner is given as much independence as possible based on their unique needs (Education Reimagined, 2015), with the long term goal of increasing students' abilities to direct their own learning (Keiler, 2018).

Summary of Learner-Centered Education

A single operational definition of learner-centered education remains elusive, but through this review of its roots and commonly held principles, some patterns emerge that allow for a common foundation of understanding, if not complete consensus. For the purposes of this study, learner-centered education is understood as an approach to formal schooling based on humanist philosophy, constructivist epistemology, and the learning sciences that involves: (a) personalization of the student learning experience, (b) authentic, experiential, collaborative learning, (c) holistic learner development, including transferable skills and dispositions, (d) cultivation of the positive and productive affective experiences of learners, and (e) shared responsibility for learning between the student and teacher. The goal, through implementation of school and classroom models aligned with the learner-centered paradigm, is to equitably and adequately prepare all students for modern life.

Factors Contributing to Limited Adoption

The primary assumption of this review of the literature was that teachers' pedagogical decisions are a key inflection point in system-wide adoption of learner-centered education or any other schoolwide change, but teachers' decisions cannot be isolated from the influences of the broader context in which they occur. For this reason, I chose to frame the contributing factors with the networked model of ecological systems theory (EST; Neal & Neal, 2013) and Weick's (1995) theory of organizational sensemaking. The networked EST model was chosen over Bronfenbrenner's (1994) original nested model because of the networked model's focus on patterns and structures of social interaction, rather than the physical locations in which interaction occurs (Neal & Neal, 2013). This makes the networked model highly applicable for

the analysis of complex social contexts such as schools and school districts. Where EST focuses on the multi-layered systems affecting an individual, sensemaking theory considers the internal world of an individual's sensemaking and decision-making processes. In combining these two theories into a theoretical framework, both environmental and personal factors pertaining to teachers' innovation-related thought and behavior can be organized and understood in relation to each other.

The complex social context and multiple roles enacted by stakeholders in a school system made it difficult to cleanly categorize certain factors. Additionally, the exosystem level of the networked model did not warrant inclusion in this review, likely due to my categorization methods. Ultimately, I used concepts from EST to conceptualize the factor groupings as such: (a) the chronosystem and macrosystem levels were combined to include all overarching sociocultural and sociopolitical factors, at least some of which can change over time; (b) the mesosystem level included all interactions between different groups, defined by either structural hierarchy or social patterns, as well as the school structures themselves, which were conceived as indirect interactions between administrators and teachers; (c) the microsystem level included the two primary social settings in which teachers engage, namely teachers' professional social networks and classroom communities; (d) finally, individual teacher characteristics were grouped together to highlight how teachers differentially perceive and enact school change initiatives.

Chronosystem and Macrosystem Factors

In the networked systems model, the chronosystem and macrosystem represent the collection of forces that shape events and interactions in the exo, meso, and microsystems. These external forces include social psychological tendencies, political and cultural systems, and the

fluid nature of patterns of social interaction (Neal & Neal, 2013). The influence of these macro-level forces have been documented in the process of school reform (Lasky, 2005). In the review of the literature, the factors that indirectly impacted teachers and the reform process included government policy, psychosocial principles of human interaction, and the collective and culturally-embedded construct of teachers' professional culture and related norms.

Government Policy

Federal and state policy impact school systems in many ways. In response to new policy, teachers sometimes alter social ties around discussion of what the new policy means for their context, thereby strengthening the social capital of those who others perceive as knowledgeable or those with whom teachers have pre-existing social ties (Siciliano et al., 2017). Teachers' formation of professional identities, which includes their values and beliefs about education and the ensuing decisions they make, can also be impacted by policy (Day et al., 2006). Additionally, the collective innovativeness of a teaching staff can drop when teachers perceive policies as restrictive to their practices (Buske, 2018). In regards to learner-centered change in particular, tension can result when teachers perceive a misalignment between their learner-centered goals and the goals deemed valuable in policy (Bingham et al., 2018). In one example of this tension, An and Reigeluth (2011) identified many teachers who perceived high stakes testing as a barrier to implementation of learner-centered practices.

Principles of Social Engagement

Principles of social engagement that have been found to be valid across contexts can also impact the school change process. At least two principles of social engagement appear to influence the formation of teachers' social networks within the professional context: homophily

and proximity (Coburn et al., 2013). Coburn et al. (2013) define homophily as “the principle that people are more likely to make contact with others that are similar to them” (p. 314). In practice, this principle was observed by Coburn et al. as the formation of cliques and subcultures within the school context based on the perception of shared beliefs, values, and experiences among the group members, particularly in relation to district reform policy. Proximity is the principle that there is an increased likelihood that individuals will strike up social ties when they have greater overlap of shared physical spaces (Coburn et al., 2013). In the school context, an example of the impact of proximity would be in the frequent tie formations between grade-level and subject-area teaching teams, informing the flow of pertinent reform information across the teaching staff (Coburn et al., 2013).

Professional Culture and Norms of Teachers

Professional norms of teachers, which one might consider characteristics of a macro level teaching culture, have impacts that influence the quality of implementation for school change initiatives. Lortie (2002), in his sociological study on teacher culture, identified three common qualities of teachers and schools that restrict change. One of these is individualism, which is Lortie’s term for the reality that most educators teach alone, rather than with other teachers. The second quality is conservatism, or a focus on small, incremental classroom changes rather than large-scale innovation. The third quality is presentism, which reflects many teachers’ focus on short-term thinking, considering what’s important for the next school day or week rather than considering a longer time horizon. A related professional norm that has the potential for significant impact is the closed-door culture of teacher privacy noted by Cohen et al. (2018) and observed by Le Fevre (2014). In Le Fevre’s teacher interviews and informal observations, the

participating teachers expected that, ultimately, they would be able to shut their classroom doors and make unilateral decisions about their teaching practices, regardless of what was happening in the broader school context. It becomes clear how this cultural norm could negatively impact diffusion of a school-wide learner-centered model when one considers the potential disconnect between a school or district's vision of change and the actual activities occurring in classrooms. Although existing cultures and norms have been indicated as barriers to school change, there is also evidence that these factors can be influenced through purposeful intervention (Albright et al., 2012).

Mesosystem Factors

As noted previously, I conceptualized the mesosystem in the context of innovative school change as including both direct and indirect interactions between administrators and teachers. Direct interactions included the principal's leadership style, which is characterized by how they interact with teachers, and the professional development opportunities administrators provide for teachers. Indirect interactions were those in which decisions by administrators directly affected teachers, but in which the two groups did not necessarily engage socially. These factors included a variety of organizational and reform characteristics.

Principal Leadership

The leadership style of the principal can have significant effects on teacher adoption of school change initiatives. Transformational leadership, for example, has been shown to make teachers more amenable to the change process. Transformational leadership is characterized by individualized support for teachers, intellectual stimulation through the sharing of new ideas, and the promotion of a collective vision for the school (Buske, 2018). This approach to leadership

has been found to be positively correlated with the collective innovativeness of the teaching faculty (Buske, 2018). In particular, the transformational leadership characteristic of individualized support for teachers is vital through the educational change process. Ballet and Kelchtermans (2008) found that teachers, lacking this support, often felt like they were “running blind” (p. 56) through the reform process and that a lack of coherent guidelines for implementation created tension between teachers. In addition to the potentially positive effects of transformational leadership, professional development could be seen as another solution to the problem of teachers lacking critical information about reform implementation.

Professional Development

Numerous studies have shown that effective professional development is often absent, resulting in teachers being thrust into school change initiatives without the knowledge necessary to enact the reform as it was envisioned on the administrative level. In one study, teachers looked for more feedback on whether or not their pedagogical approaches matched what administration envisioned for the reform (Vähäsantanen, 2015). In another, the majority of teachers indicated a general understanding of learner-centered instruction, but they wanted to learn more about practical details and implementation strategies (An & Reigeluth, 2011). Even teachers who support learner-centered reform initiatives have noted a lack of clarity about how to take on teaching roles in accordance with the reform (Ketelaar et al., 2012). Colley (2012) also found that limited understanding of the philosophy underlying learner-centered education made it difficult for nursing faculty to transfer learner-centered practices across a range of scenarios.

These studies clarify the importance of effective professional development in supporting teachers before and during the implementation process. Unfortunately, as these and other studies

show, teachers do not always have the information needed for effective implementation (Ballet & Kelchtermans, 2008; Bingham et al., 2018). Bingham et al. (2018) found that professional development opportunities in an urban high school had not evolved to meet the needs of teachers implementing technology-enhanced personalized learning, leading to confusion about how the vision for the model should translate to daily practice. These teachers provided some insight to the researchers by identifying three recommendations for professional development that would help them with implementation: clear definitions of personalized learning, more guidelines for best practices within the reform framework, and exemplars that teachers could use as points of reference. Instructional coaches have also been found to be helpful as formal participants in the professional development process (Coburn et al., 2013), but leadership must consider contextual factors involved with the instructional coach role, as it can be difficult for teachers to balance their teaching and coaching roles when asked to do both (Ballet & Kelchtermans, 2008).

Organizational Characteristics

Organizational characteristics serve as indirect means through which the school or district administration interacts with teachers. Although particular structures and cultures may predate the current administration, administrators are best equipped to change organizational characteristics by the nature of the power afforded to them by the organizational hierarchy of schools and districts. A wide range of factors fit into this category of organizational characteristics, including organizational structures, culture, and climate, the structure and policies of the reform itself, and the resources available for successfully implementing the envisioned reform.

Organizational Structure. Structural components of the school or district, such as hierarchical power structures, can impact teachers' professional lives. Generally, it seems, traditional school structures provide high levels of autonomy for teachers in the classroom (Ballet & Kelchtermans, 2008). These hierarchical power structures and the resulting impact on teacher autonomy can also affect other perceptions of teachers that could be particularly important in the context of school change. For example, survey data collected by Buske (2018) indicated that when teachers perceived these power structures as restricting their professional autonomy, it negatively influenced teachers' personal innovativeness, specifically the dimensions of teacher endorsement of school improvement and group consensus about reform objectives. Other structural considerations, such as teachers' average class sizes (An & Reigeluth, 2011), can impact teacher perceptions about the feasibility of implementing learner-centered practices as well.

Organizational Culture and Climate. The organizational culture and climate could be defined from a teacher's point of view as the ways in which they consciously perceive the "configuration of the school environment" (Buske, 2018, p. 263). The administrative leadership of the school, particularly that of the principal, plays a vital role in shaping the culture and climate of a school. Teachers' negotiation of professional identities is influenced by the organizational culture and associated power structures (Day et al., 2006). Furthermore, the organizational culture has significant influence over teacher autonomy in the classroom and broader school setting (Vähäsantanen, 2015). Vähäsantanen (2015) also notes that although eliminating teacher autonomy could facilitate faster implementation of reforms, there are negative consequences for teachers and, by extension, the school environment. These

consequences include reductions in organizational commitment, personal well-being, and satisfaction with the work environment. School culture can also have a positive influence on teachers; Ballet and Kelchtermans (2008) noted that the feeling of trust and community in the school culture made it easier for teachers to cope with sometimes emotion-laden calls for innovation and also resulted in spontaneous collaboration between teachers, important for communicating and building consensus around the details of the innovation itself.

Reform Structure. District reform policies and structure can influence the social structures of schools, such as by creating space for meetings and professional development opportunities that allow educators to connect on a regular basis, which increases the likelihood of social tie formation (Coburn et al., 2013). This increase in the number of social ties can increase the flow of resources through the system (Moolenaar, 2012), which was confirmed by Coburn et al. (2013) when they identified district policy leading to greater exchanging of information and materials among teachers. The reform policies in this study's context also illuminated who had expertise related to the reform, enabling teachers to connect with those individuals and further expand their social networks (Coburn et al., 2013).

Reform policies and structure also influence teachers' perceptions of the reform itself. Schmidt and Datnow (2005) found that less structured reforms led to vague understandings and ambiguous feelings toward the reform, whereas more structured reforms led to shared understandings of the reform and strong, divergent feelings about it and how it would impact classroom practices. It appears, from this study, that a lack of clarity around what the reform actually entailed allowed teachers to maintain a neutral stance toward it. Greater knowledge of the reform generally led to stronger opinions about the reform, both positive and negative

(Schmidt & Datnow, 2005). The difficult position school leaders find themselves in is devising reform policy and structures that provide the information teachers need to implement reforms on the classroom level while also enacting a leadership style and implementation plan that encourage teachers to interpret the changes positively.

Resource Availability and Teacher Workload. The availability of resources, including the time necessary to grapple with new approaches to teaching and learning, is vital to the enactment of learner-centered reform. Limited time has been identified as a barrier to implementation across the entire K-16 grade band (An & Reigeluth, 2011; Colley, 2012). Time is especially crucial in reform situations because of the increased workload teachers often face (Bingham, 2016; Vähäsantanen, 2015), which can be a result of both external pressures and one's own professional expectations for oneself (Ballet & Kelchtermans, 2008). In the case of two teachers who took ownership over reform implementation, Ballet and Kelchtermans (2008) noted both teachers had difficulty finding a satisfying balance between work and their personal lives, and one eventually reduced their work hours as a result. Though not all learner-centered reforms rely on technology, limited availability of supporting technology has also been identified as a barrier to implementation (An & Reigeluth, 2011).

Microsystem

Teaching is a multifaceted profession that requires educators to take on multiple roles throughout the day and throughout the school year. I conceived the two social groups in which teachers primarily engage to be their professional network of fellow teachers and their classroom communities, in which they interact with students. Studies indicate that interactions in both

groups have the potential to influence a teacher's decisions related to redesigning their classroom.

Teachers' Professional Networks

A teacher's social ties and the structure of their professional network can impact their perceptions and behaviors related to reform implementation. Le Fevre (2014) found teachers were reluctant to welcome colleagues into their classrooms for fear of being judged for their teaching. One teacher, who did embrace the reform occurring in this particular school, refused to speak up and share her stance with her coworkers for fear of social ostracization (Le Fevre, 2014). The feelings toward a reform of one's social ties have also been found to influence one's own perceptions of the reform (Siciliano et al., 2017). One way to positively influence professional networks and the productive flow of pertinent information about the school reform might be through development of communities of practice guided by peer mentors. Ma et al. (2018) found that these kinds of communities of practice were more highly interconnected and centralized in discussions pertaining to the particular change program of the study context.

Individual Teacher Characteristics

For some time it has been recognized that teachers play a crucial and active role in the enactment of reform initiatives (Luttenberg et al., 2013; van Veen & Slegers, 2006). The second primary assumption of this review is that teachers' classroom decisions, such as pedagogical innovations, are influenced not only by sociocultural and contextual factors, but also individual characteristics that influence the interpretive processes used to construct personal meaning. I organized the empirical findings using the framework of organizational sensemaking (Weick,

1995) as a way of considering how the variety of external factors detailed above are filtered through a teacher's unique frame of reference before being distilled into coherent meaning.

Sensemaking is the internal process of conceptually organizing and constructing plausible, narrative meaning out of a collection of organizational events and actions (Weick et al., 2005). It is a combination of cognitive and affective interpretive processes and has been utilized in prior studies of educational contexts (Ketelaar et al., 2012; Schmidt & Datnow, 2005). The sensemaking process is mediated by internal factors such as one's sense of agency, past experiences, knowledge, beliefs, and attitudes (Spillane et al., 2002) as well as external sociocultural and contextual factors (Lasky, 2005).

Factors Mediating the Sensemaking Process of School Change

The interpretive process teachers undergo when making meaning of school change initiatives is complicated by an array of mediating factors. The following factors have all been empirically identified as mediating the ways in which teachers perceive and enact, or choose not to enact, educational innovations. Through identification of the impact of factors such as teacher experience, professional identity, and agency, we can better understand how visions of school change are refracted and reassembled in the minds of teachers.

Teacher Agency and Autonomy. Both teacher agency and autonomy were noted in the literature as important factors that influence teachers' decision-making capacity in their classrooms. Although the differentiation between the two terms is not universally agreed upon, autonomy is often seen as being granted to someone and represents an individual having the ability to act on one's own volition, while agency is considered an individual disposition or capability one can develop to enact their choices (Priestley et al., 2012). In the studies described

in this section, however, the constructs were confounded. Luttenberg et al. (2013) defined autonomy as “the space to make decisions with regard to one’s own work and the ability to make these decisions” (p. 292). Agency was defined by Vähäsantanen (2015) as the ability to act and affect aspects of the professional context in desired ways, make decisions, and openly take stances on professional issues. Despite this conceptual muddling, the empirical results were still informative.

A teacher’s professional agency is influenced by both individual factors, such as one’s professional interests, skill sets, and past work experiences, as well as social factors such as the organizational culture, which influences autonomy (Vähäsantanen, 2015). Professional agency, and the behaviors that result from the decisions teachers make, can also influence the social context (Buske, 2018; Lasky, 2005). An important implication of the high degree of professional autonomy and agency many teachers have in the classroom (Ballet & Kelchtermans, 2008) is that social demands and outside forces alone are not enough to change a teacher’s pedagogical approach (Vähäsantanen, 2015). Interestingly, although teachers value professional autonomy (Ballet & Kelchtermans, 2008), greater autonomy can lead to teacher frustration when autonomy is perceived as increasing teacher workload (Ballet & Kelchtermans, 2008) or acting as a barrier to their professional goals (Ketelaar et al., 2012). The balance between providing the freedom to make decisions and the guidance to aid teacher operationalization of innovations is an important consideration for both administrators and teachers in the school change process.

Teacher Experience Level and Nature of Experiences. A teacher’s experience level and past experiences can influence their perception of themselves, their organizational context, and reform initiatives. Teachers’ own experiences as students can impact how they teach (Keiler,

2018), and teachers' early professional experiences have an outsized and lasting impact on their professional identities (Lasky, 2005), which might provide some understanding of why more advanced teachers, who started teaching in different times and social contexts, tend to struggle to embrace current reform (Siciliano et al, 2017; Snyder, 2017). Teachers' past experiences with reform initiatives have also been found to color their perceptions of new reforms (Schmidt & Datnow, 2005). Finally, one's past personal and professional experiences can influence the formation of one's professional identity (Day et al., 2006), which in turn impacts one's pedagogical choices (Keiler, 2018).

Teachers' Professional Identities and Associated Beliefs. Identity can be understood as “the ways that teachers think about themselves and their classroom roles” (Keiler, 2018, p. 3) and mediates teachers' instructional decisions by shaping how teachers believe they should act to be in accordance with their conceived identity (Lasky, 2005). Although there is some evidence of a collective teaching culture with shared norms, teachers often have very different perceptions of their individual professional identities (Vähäsantanen, 2015) and it is difficult to determine any single prototypical teacher identity (van Veen & Slegers, 2006). However, empirical evidence supports a clear delineation between teachers whose identities are primarily learner-centered and those whose identities are primarily content-centered (van Veen & Slegers, 2006). Those with identities oriented toward content delivery often struggle with learner-centered reforms (Ketelaar et al., 2012; Keiler, 2018). The differences between these distinct identities include: 1) a focus on the process of learning and student well-being versus delivery of content and 2) an extended orientation versus a restricted orientation in terms of a teacher's perception of their role in the broader school context outside of the classroom (van Veen and Slegers, 2006). Although a clear

delineation between learner-centered and non-learner-centered identities does exist, identities also shift along a continuum from stable to fragmented, depending on factors such as experiences in the classroom, culture and power structures of the organization, and contextual events that threaten existing norms and teaching practices, which indicates identities can change (Day et al., 2006). Strongly fixed identities have been noted as a barrier to full participation in reform implementation, but school change initiatives also provide an opportunity in which renegotiation of one's professional identity is more accessible (Keiler, 2018; Lasky, 2005).

A teacher's professional identity is tied to one's beliefs about the right way to teach and the purpose of school (Lasky, 2005), which can influence decision-making with regards to implementing learner-centered practices and models. The conceptual tie between one's identity and beliefs is supported by Colley's (2012) finding that nursing faculty members' beliefs in the principles of learner-centered education were a key factor in successful implementation, much in the same way identity has been found to impact operationalization. Teachers' beliefs about their students can also influence their comfort level and decision making with regards to learner-centered practices. Teachers who were hesitant to implement learner-centered practices were doubtful about their students' abilities to take greater responsibility for their learning (van Veen & Slegers, 2006) and have perceived student behavior as a barrier to implementation (An & Reigeluth, 2011). Generally, this research indicates that a teacher's professional identity and beliefs influence one's interpretation of reform initiatives (Luttenberg et al., 2013; Schmidt & Datnow, 2005; van Veen & Slegers, 2006). Although these two factors play important mediating roles in a teacher's interpretation of a reform, the actual process of making meaning, both its

affective and cognitive components, must be explored in order to paint the full picture of a teacher's sensemaking process.

Teacher Interpretation of the Reform Initiative. Teacher interpretations of a reform vary greatly, even within the same school context (Ballet & Kelchtermans, 2008). One's perception of the reform can change over time, and the reform itself can change over time as the vision of the reform is translated into practice, resulting in an interpretive process that is fluid and continuous (Luttenberg et al., 2013). As identified by Luttenberg et al. (2013), these interpretations then inform teachers' decisions about how and to what degree they will implement the reform in their classroom.

Affective Response. The process of school change can be highly emotional (Helpap & Bekmeier-Feuerhahn, 2016), particularly for teachers who hold professional beliefs that differ from the beliefs implicit in the proposed reform (van Veen & Slegers, 2006). Consideration of the emotional impact of change is important for a variety of reasons. These emotional responses impact teachers' perceptions of what implications an innovation will have on their classroom practices. Findings also show that more positive emotional responses to innovations are tied to involvement in reform initiatives (Helpap & Bekmeier-Feuerhahn, 2016; Schmidt & Datnow, 2005; Vähäsantanen, 2015). Positive emotional responses are also positively correlated with change commitment, change efficacy, and change expectations, which foster a desire to participate in the change process, a belief the reform will be effective, and a belief that one's participation will meaningfully add to the success of the reform (Helpap & Bekmeier-Feuerhahn, 2016). Finally, positive and negative emotions also impact one's resourcefulness in the

implementation process, as well as one's mental and physical well-being (van Veen & Slegers, 2006).

Cognitive Interpretation. The cognitive interpretive process and resulting perceptions of the reform and one's own role in the reform process can greatly impact teacher behaviors. With regards to a teacher's self-efficacy for operationalizing educational innovations in their classroom, Siciliano et al. (2017) found that teachers who had more positive beliefs about their ability to successfully implement an innovation were more likely to be involved in discussions pertaining to the reform, thus increasing their social capital and their ability to influence their professional social network. However, the pressures and often increased workload of school change can blunt initial enthusiasm. In one case study, a teacher began to doubt her own abilities to keep up with the expectations of innovation operationalization (Ballet & Kelchtermans, 2008). Low self-efficacy with regards to reform implementation also increases the likelihood that a teacher will intentionally resist the change (Helpap & Bekmeier-Feuerhahn, 2016).

Another component of the interpretative process is a teacher's perception of the risk involved in enacting school reforms in their classroom. Reform can be perceived as a professionally risky endeavor, in which teachers are called to place aside well-worn and trusted pedagogy for experimentation with new practices. Risk can be conceptualized as the perception of potential for loss (Le Fevre, 2014), and in the context of school change, that loss could be conceived as one's standing within one's professional context or the loss of one's existing professional identity. Risk-taking, a key factor in innovation and effective change in many industries, occurs when an individual perceives that a potential gain outweighs a potential loss (Le Fevre, 2014). Through this lens, it would appear unlikely that teachers who do not perceive

the value of a reform would be willing to risk participation. In one study, Le Fevre (2014) found teachers perceived increasing personalization to be a risky activity because of the decrease in predictability that they felt would result with each student doing something different and without constant direct guidance from the teacher. In order to increase the likelihood of risk-taking, Le Fevre (2014) emphasizes the importance of creating a culture of trust to mitigate perceptions of risk.

Summary of Contributing Factors

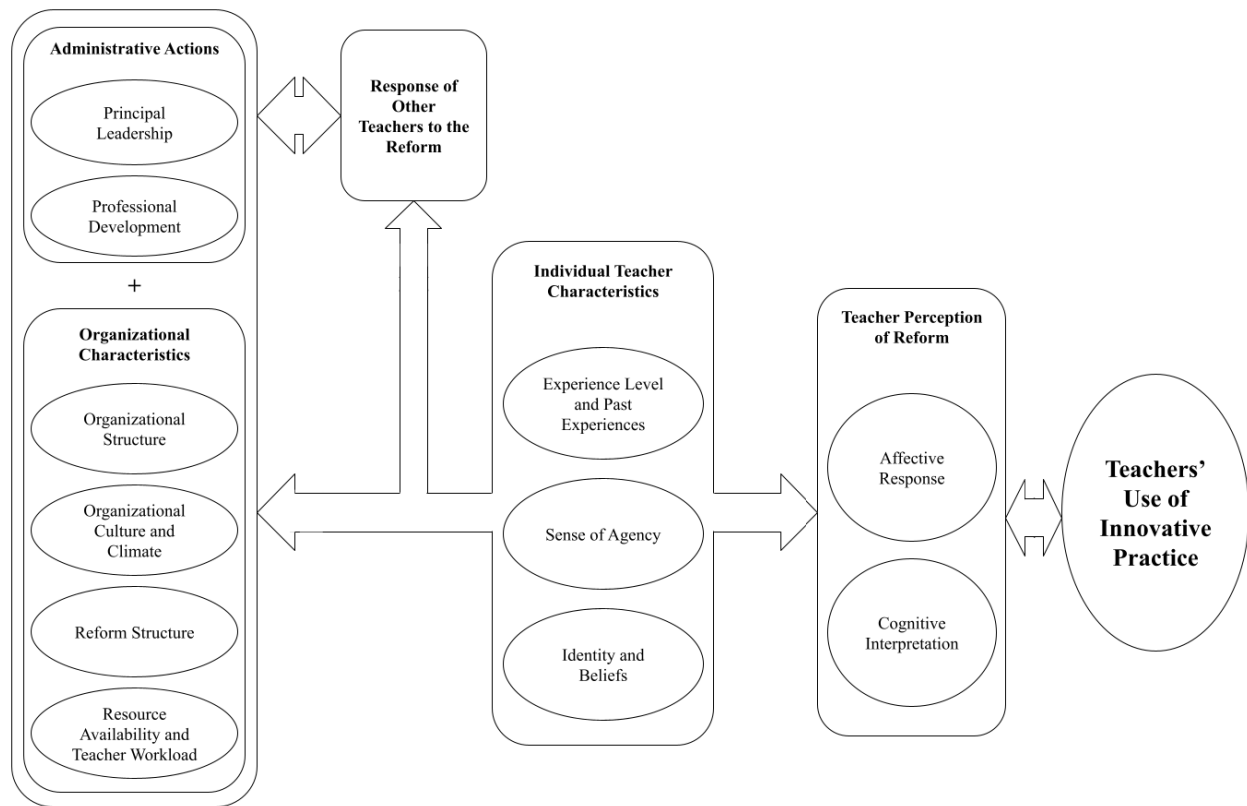
Based on this review of the literature, it seems teacher actions have powerful mediating effects on how school- and district-wide change is enacted in the classroom. The decisions that teachers make are influenced by a host of factors across wide ranging and interconnected system levels. In the sociocultural and sociopolitical sphere, the social principles that underlie human relations, as well as government policy and the professional culture of teachers, affect teachers' classroom innovation. Within the district or school context, the ways in which administrators, especially principals, interact with teachers also affects teachers' adoption decisions. This occurs even indirectly through factors such as the structure of the organization and of the reform itself. Beyond interactions with administrators, interactions between teachers can influence opinions and ensuing actions related to operationalization. All of these factors enter into a teacher's sensemaking process, mediated by personal factors such as teaching experience, professional identity, and self-efficacy, ending with the teacher making personal meaning out of the educational innovation. Through this complex process, teachers make professional choices that align with their perceptions about the change initiative in relation to their self-conceived professional identities.

Development of Conceptual Framework

This review of the literature should not be considered exhaustive, particularly because of how complex the process of operationalizing educational innovations can be. Rather, these factors were used to induce broader categories, organized through an applicable theoretical framework, to guide understanding of the innovation operationalization process of teachers in school change contexts. As noted previously, both Neal and Neal's (2014) networked EST model and Weick's (1995) model of organizational sensemaking framed my understanding of the factors that influence teaching practices and informed the development of my conceptual framework (Figure 1.1). The primary question this framework answered was, "What factors influence teaching practices, particularly the use of learner-centered innovations?"

Figure 1.1

Conceptual Framework



In this framework, macro-level sociocultural and sociopolitical factors were not visually represented but are understood to influence all components of the district context. district-level factors were given visual precedent since they are the factors that can be more directly influenced in an intervention designed to address the problem of practice. In the district itself, various inputs from administrators, as well as organizational characteristics, interact with and influence the teaching staff. Some of these administrative and organizational factors precede the introduction of the innovation, while others come into existence to support classroom operationalization of the innovation. These factors and the perceptions of the rest of the teaching staff are interpreted by the teacher working through the sensemaking process regarding the

innovation. This teacher creates individual meaning, comprised of their affective response and cognitive interpretation, by filtering this collection of inputs through their unique set of personal and professional characteristics and experiences. This individual interpretation leads to a decision to operationalize or reject the innovation. All connecting arrows are bi-directional to indicate that, despite hierarchical power structures in educational systems, all individuals and components of school systems are able to influence the others. Ultimately, this review of the literature and the resulting conceptual framework guided formulation and analysis of the exploratory needs assessment intended to help uncover how this study's problem of practice presents itself in the school district that serves as the context of the study.

Chapter 2

Needs Assessment

There is a significant body of evidence that schools and districts are struggling to operationalize learner-centered innovations in classrooms. The review of literature pertaining to this problem of practice revealed a variety of factors that likely have some role in either propagating or diminishing this problem. To determine which factors were most prevalent in the context of this study, I conducted a mixed methods needs assessment, which helped to better understand what changes would be most beneficial in helping teachers operationalize learner-centered innovations. This chapter opens with a review of my professional context and a more detailed explanation of the purpose of this needs assessment study before explaining the study itself, including my research questions, methods, findings, and interpretation.

Context

In conducting contextualized research, it is essential to consider characteristics of that context that could influence its current state or the ways in which it might change in light of new developments. The district of focus in this study is a suburban, public school district in eastern Pennsylvania. It is a small district, comprised of three schools (one elementary, middle, and high school). According to the American Community Survey – Education Tabulation (ACS-ED) conducted by the National Center for Education Statistics (NCES), as of the 2019-2020 school year, there were 1584 total students, 416 (26%) of whom had individualized education programs, and an overall student-teacher ratio of 13.87 (NCES, 2020). However, this ratio does not represent the average class size, as many classes are co-taught by general education and learning support teachers. In the district community, 85% of residents identify as White, with the second

largest racial/ethnic group being those who identify as Hispanic or Latino (9%) (NCES). A large majority of students (91%) speak English at home, while most others (8.7%) identify themselves as speaking English very well. Socioeconomically, parents of students in the district have an average salary of \$84,712, and 76.7% of district families are homeowners (NCES). According to the ACS-ED 2015-2019 survey, 20.5% of families with students in the district are economically disadvantaged (NCES). However, more recent data from the Pennsylvania Department of Education (PDE) identify 26.2% of district families as economically disadvantaged for the 2020-2021 school year (PDE, 2021), though it is unknown if these differences show true longitudinal changes or reflect methodological differences in data collection. Using the more recent estimate of 26.2% of families being economically disadvantaged, the district is in approximately the 84th percentile for average family income across all 499 Pennsylvania school districts listed in the data.

There are also a number of school factors and characteristics pertinent for this overview, including the district's learner-centered vision and some significant changes that have recently occurred in the district. The district's belief in LCE is represented in the two documents that comprise its district vision. The first of these documents is the Profile of a Graduate (PoG), which includes the knowledge, skills, and dispositions the district learning community believes students should embody by the time they graduate. Although the document is currently undergoing routine revision based on stakeholder feedback, representative components include creativity, entrepreneurialism, and health literacy. The second document, the Learning Beliefs (LBs), represent the principles that the district wants to guide classroom teaching and learning. Unlike the PoG, the LBs were adapted from a whitepaper drafted by Education Reimagined

(2015) and have remained unchanged since the vision was first unveiled for the 2016-2017 school year. The five LBs reflect the beliefs that learning should be (a) competency-based, (b) personalized, relevant, and contextualized, (c) characterized by learner agency, (d) socially embedded, and (e) open-walled. These beliefs are defined below in Table 2.1 and are paraphrased, rather than directly quoted, in order to maintain district confidentiality.

Table 2.1

Definitions of the District Learning Beliefs

Learning Beliefs	district Definition (paraphrased)
Competency-Based	Learner growth is based on demonstrated mastery of clearly defined competencies as outlined on the profile of a graduate.
Personalized, Relevant, and Contextualized	Learning is tied to each learner's perspective, past experiences, and interests.
Characterized by Learner Agency	Learners make important and developmentally appropriate decisions regarding their learning experiences in school.
Socially Embedded	Learning is a collaborative process including many stakeholders, including the learner, their peers, educators, and the learner's home support system.
Open-Walled	Learning happens everywhere, not just in formal education contexts, and the expansiveness of learning opportunities in the world should be leveraged for student learning.

These definitions from the district website are also supplemented by two to three specific examples of the implications of each learning belief for pedagogical practice. For example, under

the definition of competency-based, one of the listed implications is that constructivism should guide the district's approaches to teaching and learning. As noted in Chapter One, this vision, particularly the learning beliefs, represents the district administration's goal for the future of teaching and learning in the district.

In addition to this push for the operationalization of the district's learning beliefs, there were a number of significant changes that could play a significant role in guiding the district into the future. First, financial stress in the district led to a reconfiguration between the 2019-2020 and 2020-2021 school years. This resulted in the consolidation of two elementary schools into one and a reduction in the number of full-time teachers, with many specialists being reduced to part-time hours. Secondly, the ongoing coronavirus pandemic has led to substantial alterations to teaching and learning, with learning occurring completely online between mid-March 2020 and mid-February 2021. Both this financial stress and the district's response to the pandemic appear to have led to increasingly polarized opinions among stakeholders about the district's choices. The district's response to both financial instability and the coronavirus pandemic reflect the reality that the district is currently in the midst of significant change, which might provide some unique challenges and opportunities to support teachers' operationalization of learner-centered innovations.

Purpose and Rationale

As previously noted, there are many factors across system levels that directly and indirectly influence teachers' practices and implementation of educational innovations, ranging from historical perceptions of learning (Ertmer & Newby, 2013) to individual characteristics of teachers, such as one's career stage (Bingham & Dimandja, 2017; Hargreaves, 2005; Richter et

al., 2011; Sawyer, 2014; Stone-Johnson, 2011; Vahasantanen, 2015) and understanding of learner-centered approaches (Bingham, 2016; Bingham & Dimandja, 2017; Bingham et al., 2018). For this needs assessment, I sought to identify which factors are likely impacting teachers' operationalization of innovative, learner-centered practices in the district. This is an appropriate approach to understanding the problem of practice because actions in a complex organizational system, such as the actions of teachers in school settings, are mediated by an equally complex interpretive process of meaning making that involves the individual's consideration of many elements of the organizational context (Schmidt & Datnow, 2005). With this in mind, I set out to explore a variety of factors likely to play a role in the practices of district teachers, including (a) policies and messaging received by teachers from other district stakeholders, (b) the degree of learner-centeredness of teachers' beliefs and practices, and (b) teachers' perceptions of the district context and their professional roles and identities in light of the district's learner-centered vision.

Research Questions

Research questions (RQs) were developed based on the theoretical framework of networked EST (Neal & Neal, 2013) and organizational sensemaking (Weick, 1995) established in Chapter One, as recommended by Grant and Osanloo (2014). These questions reflect a consideration of the key factors listed above, as well as how the various data sources used to answer these questions inform and expand my understanding of my answer to each question:

- RQ1: How do policies, plans, and other messages from district stakeholders (i.e., school board, district administrators, and building administrators) support or hinder teacher operationalization of the district vision?

- RQ2: To what extent do teachers hold learner-centered beliefs and utilize learner-centered practices in their classrooms?
- RQ3: How do teachers perceive their professional context and their professional roles and identities, particularly in light of the district's vision for teaching and learning?
- RQ4: How do these data strands converge, diverge, and supplement each other?

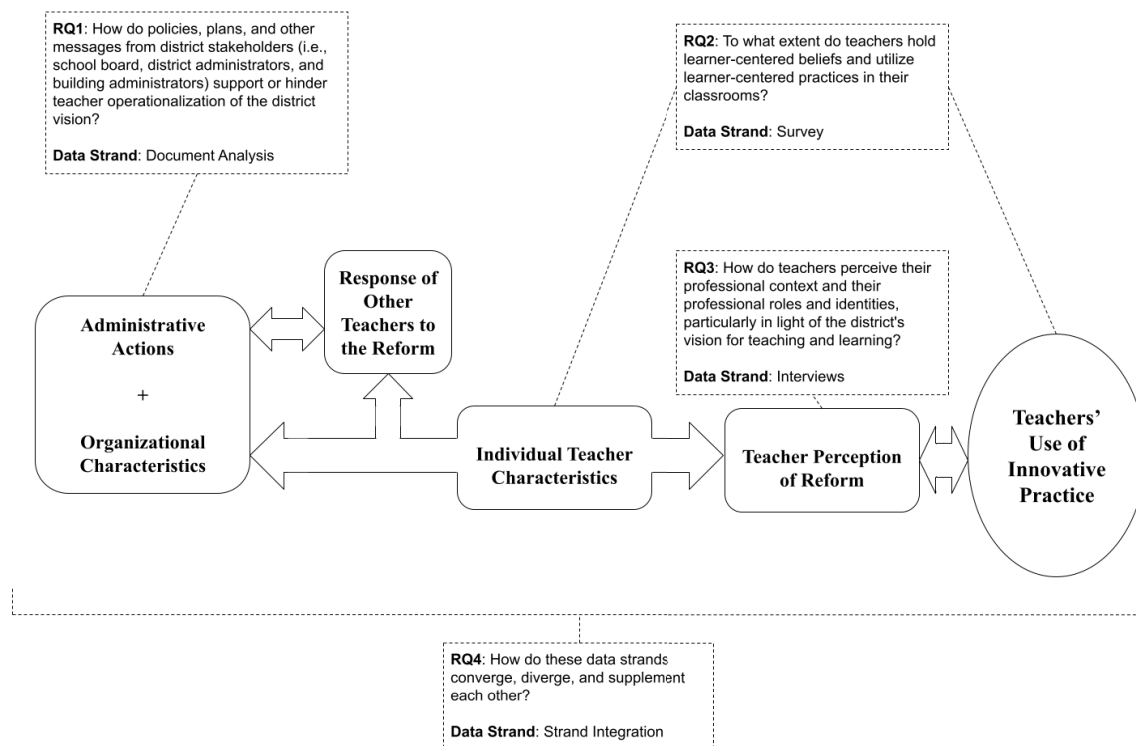
Methods

This study utilized a mixed methods design, in which multiple strands of data, both qualitative and quantitative, were collected, analyzed, and interpreted (Creswell & Plano Clark, 2017; Teddlie and Tashakkori, 2003). A mixed methods approach was selected because of the ability of this approach to add breadth and depth to one's understanding of research questions (Johnson et al., 2007). A deep and broad understanding is particularly important when trying to understand a wicked problem, one embedded in a complex system, such as the problem of practice in this study (Mertens, 2018). This mixed methods study took the specific form of a modified convergent parallel design, in which data in each strand was collected and analyzed separately before being integrated for a mixed methods interpretation (Creswell & Plano Clark, 2017). Whereas Creswell and Plano Clark (2017) identify this design as including one qualitative and one quantitative strand, the design of this needs assessment was modified to include two qualitative strands and one quantitative strand. The two qualitative strands consisted of a document analysis and interviews, and the quantitative strand was a teacher survey. These strands were used to answer research questions one, two, and three, respectively, while research question four was answered by integrating the three data strands together. A visual depiction of the connections between factors of interest, research questions, and data strands have been

mapped onto a modified version of the conceptual framework that was condensed for clarity (see Figure 2.1).

Figure 2.1

Connecting Factors, Research Questions, and Data Strands



Document Analysis Procedures

Document analysis involves the collection and analysis of written or otherwise recorded artifacts relevant to a study (Lochmiller & Lester, 2017). This document analysis was conducted to identify the policies, plans, and other messages teachers are receiving from various district stakeholder groups. These documents, including secondary curriculum and school board policies, were organized into categories to aid in organizing the collection and analysis process.

Document Selection

To select relevant documents, I inspected the district website, including all subpages, to identify any pages or embedded documents related to district policies and curriculum planning. This resulted in the selection of ten total documents. All of these were publicly available online as of August, 2020. All documents were formatted as either webpages, Google Documents (GDOC), or portable document format (PDF) files. As I identified pertinent documents, I added links to them in a digital list I created. Finally, I organized these documents into categories representative of the stakeholder groups most responsible for producing each document (i.e., the school board, district administrators, or middle school administrators). The full list of documents within each category is presented in Table 2.2.

Table 2.2

Documents Organized by Category

Document Categories	Documents
School Board Documents	1. Policy on Exceptions to Traditional Course Sequence (PDF) 2. Policy on Class Rank (PDF) 3. Policy on Academic Standards (PDF)
District Administrator Documents	4. “About Us” (webpage) 5. Overview of Teaching and Learning (webpage) 6. Secondary Social Studies Curriculum (PDF) 7. Secondary English Curriculum (PDF) 8. Secondary Math Curriculum (PDF)
Middle School Administrator Documents	9. 2020-2021 Student/Parent Handbook (GDOC) 10. FAQ for New Math Curriculum (GDOC)

Document Analysis

I analyzed each document in juxtaposition to the principles of LCE noted in Chapter One and represented in the district's vision for teaching and learning. Due to the length and complexity of the 2020-2021 Student/Parent Handbook, sections of the document were analyzed separately to better understand how ideas represented in each section were aligned or misaligned with the district's vision. This document analysis took the form of a content analysis (Krippendorff, 2018) with the goal of determining which of the five principles of LCE each document or document section addressed and whether that document or section was aligned or misaligned with the principle. The five principles of learner-centered education identified for this study were (a) personalization of the student learning experience, (b) authentic, experiential, collaborative learning, (c) holistic learner development, including transferable skills and dispositions, (d) cultivation of a positive emotional climate, and (e) shared responsibility for learning between the student and teacher.

Survey Procedures

This section includes information about participant selection and data collection. A questionnaire was used to determine the degree to which teachers' beliefs and practices aligned with LCE. Details of the questionnaire are described below.

Participant Selection

The accessible population (Pettus-Davis et al., 2011) for this survey was the teaching staff of the district middle school, who represent the theoretical population of K-12 teachers in similar professional contexts, as previously described, to whom these results are assumed to be generalizable. As such, this study utilized a form of convenience sampling (Lochmiller & Lester,

2017). All middle school teachers ($N=30$) were invited to complete the questionnaire anonymously online in May of 2020. The school principal sent out an email on my behalf to ensure teachers were aware this study had administrative approval. In this email, the principal attached documentation I created explaining the purpose of this study, the steps involved for participants, a note about the voluntary nature of participation, and an assurance that their questionnaire responses were completely anonymous, even to me.

Data Collection

A questionnaire link was also included in the email sent by the principal to the teaching staff. The survey consisted of 31 Likert-style items divided into two sections (see Appendix A). The first section measured teachers' beliefs regarding learners, learning, and teaching. The second section measured teachers' self-reported teaching practices. All items were adapted from and previously validated by McCombs et al. (1997), who created the Assessment of Learner-Centered Practices (ALCPS) questionnaire based on the American Psychological Association's (1993) learner-centered psychological principles.

The section of the survey designed to measure learner-centered beliefs utilized a four-point Likert-style rating scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (4). This section included 15 items that were divided into subsections on learner-centered beliefs (seven items), non-learner-centered beliefs about learners (four items), and non-learner-centered beliefs about teaching and learning (four items). The section measuring learner-centered practices utilized a four-point Likert-style scale ranging from "Never" (1) to "Almost Always" (4). This section included 16 items that were evenly divided into four subsections, which included the degree to which teachers (a) cultivated positive interpersonal relationships with

students, (b) encouraged learner agency and maintained high expectations, (c) encouraged higher-order thinking and self-regulation, and (d) adapted practices based on individual learner characteristics. All participants responded within an approximately two month window that began in early May and ended in late June, when the survey was closed to further participation.

Data Analysis

Utilizing the data analysis process outlined by Creswell and Plano Clark (2017), I began by preparing the data by importing it into IBM SPSS v28, reviewing the data for missing values, and inverting scores on non-learner-centered beliefs so composite scores could be calculated. Creating a frequency table reflecting total response distributions to each survey subsection and computing composite scores for learner-centered beliefs, learner-centered practices, and overall learner-centeredness (i.e., a combination of learner-centered beliefs and practices) served as a form of data exploration, allowing me to more easily identify patterns in the findings by narrowing my focus from the raw data to a smaller number of composite scores. Data analysis involved calculating descriptive statistics, including mean, median, mode, and standard deviation, for all composite scores. Inferential statistics were not utilized for this data due to the cross-sectional, exploratory nature of this needs assessment (Lochmiller & Lester, 2017). Finally, the descriptive statistics were organized in table form prior to interpreting the data.

Interview Procedures

I conducted teacher interviews throughout the summer of 2020 with the broad goal of identifying teachers' perceptions of the district's learner-centered vision. In this section, that process is explained. Components of the process include participant selection, data collection, and analysis.

Participant Selection

Much of the participant selection process for this strand overlapped with the process for the survey strand. Information about the interviews was sent out in the same documentation that explained the survey and was attached to the email sent out by our school principal introducing this study to teaching staff. Participants who were interested were informed of the purpose of the interview, the steps involved in participation, the approximate length of the interview (15-30 minutes), and how I would maintain confidentiality (e.g., not including details in my writeup that would make it clear to colleagues and administrators who participated). Interested teachers were asked to contact me via email or phone to set up a day and time for their interview.

Data Collection

Each interview was conducted with online video conferencing software that allowed me to save audio recordings for later transcription. To protect confidentiality, these recordings were maintained in a password protected computer folder on a computer to which no one else had access or administrative privileges. Interviews were semi-structured and consisted of six primary questions (see Appendix B). Most of these questions were supplemented by a bank of one to three follow up questions to ask based on the nature of the participant's response to the initial question. As such, these follow-up questions served to clarify my understanding and promote participant elaboration. All questions were designed to evoke teachers' thoughts and feelings regarding topics such as the meaning and purpose of the district's vision as well as its alignment to their own educational beliefs and practices (RQ3). Throughout the interviews, I paraphrased to participants my understanding of what they were saying as a form of member checking (Creswell & Plano Clark, 2017).

Data Analysis

The first step of the analysis process involved data preparation and exploration by reading through software-generated transcripts of the interviews and fixing typos and other mechanical errors. Next, I read through the transcripts and added jottings and analytic memos (Miles et al., 2018) to capture my initial thoughts about the data. Next, I worked through an initial round of coding, utilizing a priori codes based on my conceptual framework. In a second round of coding, I generated descriptive and in-vivo codes (Lochmiller & Lester, 2017). Next, I identified themes that captured the key ideas that emerged through interviews, ending my analysis when I reached saturation in the data.

To maintain researcher reflexivity (Lochmiller & Lester, 2017), I identified two primary aspects of my own identity that I perceived as most likely to influence my analysis: (a) my role as a professional colleague of participating teachers and (b) my professional role of operating a learner-centered SWs, which has informed my perspective on LCE. As a professional colleague of those who participated in these interviews, I had to acknowledge the likelihood that I would interpret the data through a lens shaped by my own experiences in my professional context and with participants. As someone who has already been spending significant time operationalizing the district vision and LCE, I had to consider how my experiences with and knowledge of LCE and the district vision would influence my interpretations of others' experiences. I used this awareness of my potential biases to inform my analysis, thereby minimizing this threat to credibility (Krefting, 1991).

Findings and Results

This section includes findings and results for each data strand. Findings from the document analysis were used to identify the documents and underlying policies, practices, and messages that are or are not aligned with the district vision. Survey results revealed teachers' general understanding and use of learner-centered and non-learner-centered practices. Findings from the interviews suggested a number of key themes valuable to identifying the needs of teachers to with regards to operationalizing the district vision.

Document Analysis Findings

The document analysis revealed a total of seven documents or document sections that were aligned with LCE, four that were neutral, and four that were misaligned (see Table 2.3). Analysis of these documents was organized into sections reflecting these degrees of alignment (i.e., aligned, neutral, or misaligned). Within each of these sections, documents were arranged by stakeholder groups.

Aligned Documents

The documents aligned with the learner-centered approach included the school board's policy on exceptions to the standard course sequence, the district's webpage providing an overview of their approach to teaching and learning, the district's "About Us" webpage. Additionally, sections of the middle school's student handbook that aligned with LCE included the emphasis on student needs and interests, career clusters, and social-emotional supports. The FAQ for the New Math Curriculum was the final document aligned with a learner-centered approach.

In the school board's policy on exceptions to the traditional course sequence, they provided three alternatives to that sequence: exams to "test out" of a subject, private tutoring by a certified teacher, or an independent study experience designed by the student. These three alternative paths, particularly the ability for students to design their own independent study, provide an opportunity for learners and their families to design the learning experience for that student in a way that better matches their strengths, needs, and goals (LCE Principle #1).

The district webpage reviewing their approach to teaching and learning highlighted the district's goal of providing a learner-centered education for all students. The "About Us" page elaborated by reviewing the district's five learning beliefs. This document also noted the importance the district places on educating the whole child, including the intellectual, social-emotional, and physical domains. Finally, this page emphasized learner development of 21st century skills such as creative thinking and innovative problem-solving. These ideals of holistic development reflected learner-centered education (LCE Principle #3).

In an opening section of the student and parent handbook, there was an emphasis on the importance building stakeholders place on knowing the needs and interests of every student, which is an essential prerequisite of personalizing learning experiences (LCE Principle #1). Another section of the handbook highlighting personalization was the discussion of career clusters, which is a way of helping students plan their high school course load prior to their freshman year based on their career interests and goals. The handbook section reviewing social-emotional supports for students highlighted the importance the school places on the emotional climate of learning (LCE Principle #4). These social-emotional supports included an anonymous student referral system, student assistance program, peer mediation, school

counseling, and access to third-party social workers. The final supporting document, the FAQ about the middle school's updated math curriculum, explained that it was designed to support student development of transferable skills (LCE Principle #3) and help students work collaboratively to solve real-world problems (LCE Principle #2).

Neutral Documents

The documents identified as being neutral with regards to LCE included district curriculum documents and the handbook section on course offerings. The district's curriculum documents did not specifically refer to any of the five principles of LCE. In other words, the content of these curriculum documents did not necessarily represent misalignment between the district curriculum and the district's learner-centered vision, but there was no explicit or even implicit connection between the two. They appear to exist independently of each other.

Similarly, the course offerings reflected in the student handbook included what are generally considered core subjects (e.g., math, language arts, etc.) as well as elective subjects (e.g., physical education, art, etc.). Although the handbook explained that all core subjects are compulsory, learners did have options regarding selection of their specialty courses. This learner optionality could be viewed as a precursor to more personalized approaches to learners' school experiences, though this policy did not appear robust enough in its current form to be called a fully personalized approach. For example, the degree of optionality required for personalization might include the opportunity for learners to design their own courses with educator assistance.

Misaligned Documents

The documents misaligned with LCE were the board policies regarding class rank and academic standards and misaligned document sections included those about recognition of

student achievement and course pacing and sequencing. The board's policy supporting official class ranks highlighted how academic achievement is prized in the district, with this policy promoting the practice of comparing and ranking individual student academic achievement to that of their peers. This policy, in combination with the lack of policies promoting the recognition of other kinds of student accomplishments (e.g., artistic achievement, social-emotional skills, etc.), highlighted a district focus on academic development, rather than the holistic development essential in LCE (LCE Principle #3). Similarly, the board policy on academic standards highlighted that district standards should be based on the standards developed by the Pennsylvania Department of Education (PDE). Although these state standards are not inherently misaligned with LCE, this board policy did set boundaries for the kinds of district standards that are encouraged. Because the current PDE standards are tied to traditional academic subjects (i.e., math, language arts, etc.), this board policy inherently discouraged the development of learning standards that could represent other domains of student learning and development.

The section of the student handbook covering recognition of academic achievement explained that grading practices involve learners receiving numerical grades and corresponding letter grades, which are then used to determine which students are granted the designation of being on the "Honor Roll" or "High Honor Roll." Recognition of academic achievement is not in itself misaligned with LCE. However, much like the school board policy on class rank, grading policies and the recognition of academic achievement through an honor roll system without any policies designed to recognize other forms of student accomplishment illustrated the value placed on one domain of learner development (i.e., academic achievement) over other domains that

comprise the whole child (LCE Principle #3). The second aspect of this section that was misaligned with LCE is linear, time-bound course sequencing. Despite some variety of pacing options with mathematics, courses in other subjects were organized by age-based grade levels, with students moving together through courses at the same pace and in a linear order. This linear and time-bound approach does not provide the flexibility needed for a truly personalized experience (LCE Principle #1), in which pacing and sequencing would be responsive to individual student needs, goals, and interests.

Table 2.3*Documents Organized by Alignment to Learner-Centered Education*

Stakeholder Group	Supporting	Neutral	Inhibiting
School Board	1. Policy on Exceptions to Traditional Course Sequence		1. Policy on Academic Standards 2. Policy on Class Rank
District Administrators	2. About Us 3. Overview of Teaching and Learning	1. Secondary Social Studies Curriculum 2. Secondary English Curriculum 3. Secondary Math Curriculum	
Middle School Administrators	4. Handbook - Emphasis on Individual Student Needs and Interests 5. Handbook - Career Clusters 6. Handbook - Student Social-Emotional Supports 7. FAQ for New Math Curriculum	4. Handbook - Course Offerings	3. Handbook - Student Scheduling 4. Handbook - Grading and Retention Policies

Survey Results

Several questionnaire responses were incomplete and thus excluded from analysis. After removing these responses, the response rate was 37% ($n=11$), which was likely lower due to the pandemic-induced challenges the district teachers were facing at the time of survey administration. A frequency table was developed to identify the number of responses on each

survey subsection that reflected the varying degrees to which these answer choices indicated agreement with learner-centered beliefs and use of learner-centered practices (see Table 2.4). Descriptive statistics were calculated for composite scores of learner-centered beliefs, learner-centered practice, and overall learner-centeredness (a combination of beliefs and practice) (see Table 2.5). For all subsections relating to both beliefs and practices, a majority of responses (i.e., >50%) were at least moderately aligned with LCE. The mean for all three composite scores were just below or above a score of three, representing that, overall, respondents “Somewhat Agree” with learner-centered beliefs and “Often” use learner-centered practices. Standard deviation for all three was also fairly low, ranging from .30 to .37.

In the first part of the survey, almost all participant responses indicated partial agreement (61.0%) or strong agreement (33.8%) with learner-centered beliefs. The only two statements with which some teachers disagreed were about a teacher's self-acceptance being more critical to student learning than their teaching skills and the effectiveness of accepting students where they are in making them more receptive to learning. For non-learner-centered beliefs about learners, partial agreement (40.9%) and strong agreement (2.3%) were lower than for learner-centered beliefs, but still represented close to half of all item responses. Responses to items reflecting non-learner-centered beliefs about pedagogy were the most evenly distributed across all for response choices. Over half of responses indicated partial disagreement (36.4%) or strong disagreement (25.0%) with these non-learner-centered beliefs about pedagogy. Still, that leaves nearly 40% of responses that indicated partial or strong agreement with non-learner-centered pedagogical beliefs.

In part two of the survey, none of the over 100 item responses indicated a teacher "Never" utilizes one of these learner-centered classroom practices. Regarding practices related to the creation of positive interpersonal relationships with students, a majority (68.2%) of responses indicated teachers "Almost Always" utilize these practices. Responses indicated a lower frequency of teachers' honoring learner-agency and maintaining high expectations, with 68.2% of responses indicating these practices occurred "Often," rather than "Almost Always." For the subsection reflecting the extent to which teachers encourage students to self-regulate and engage in higher-order thinking, responses were more dispersed, but the majority of responses still indicated teachers utilized these practices "Often" (50.0%) or "Almost Always" (27.3%).

Table 2.4*Frequency of Survey Responses by Subsection*

Survey Subsections	Alignment of Beliefs			
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
Learner-Centered Beliefs	0 (0.0%)	4 (5.2%)	47 (61.0%)	26 (33.8%)
Non-Learner-Centered Beliefs (about learners)	9 (20.5%)	16 (36.4%)	18 (40.9%)	1 (2.3%)
Non-Learner-Centered Beliefs (about pedagogy)	11 (25.0%)	16 (36.4%)	10 (22.7%)	7 (15.9%)
	Alignment of Practices			
	Never	Sometimes	Often	Always
Cultivate Positive Relationships	0 (0.0%)	1 (2.3%)	13 (29.5%)	30 (68.2%)
Learner-Agency and High Expectations	0 (0.0%)	0 (0.0%)	30 (68.2%)	14 (31.8%)
Higher-Order Thinking and Self-Regulating	0 (0.0%)	5 (11.4%)	21 (47.7%)	18 (40.9%)
Adapt Practices for Learner Needs	0 (0.0%)	10 (22.7%)	22 (50.0%)	12 (27.3%)

Table 2.5*Measures of Central Tendency and Standard Deviation*

Composite Score Labels	Mean	Median	Mode	SD
Learner-Centered Beliefs	2.99	2.87	2.80	.37
Learner-Centered Practice	3.33	3.19	2.94	.34
Overall Learner-Centeredness	3.16	3.06	2.97	.30

Interview Findings

The coding process resulted in 48 initial codes that were reduced to 25 pattern codes (Miles et al., 2018) by consolidating those that were redundant and highly overlapped. These 25 codes were then categorized into themes, resulting in six total, as reflected in the code table (see Appendix C). These themes range in focus from the varied and often competing messages and directives teachers received from other system levels to recommendations of these teachers for how they could better be supported through the process of operationalizing the district's vision. Following is an explanation of each of the six themes.

Competing Inputs and Structural Barriers Across System Levels

Through these interviews, it became clear that participating teachers perceived competing inputs and structural barriers that hinder operationalization of the district's learning beliefs (e.g., competency-based, learner agency, etc.). In general, the teachers interviewed for this study felt supported by administrators. One participant identified the professional development provided by the district as being helpful to "understand how to implement" the district vision. Two participants identified the emotional support they feel they receive. For example, one said administrators are "understanding" when the participant tries something new in their classroom. Another teacher noted their belief that they "work in a place that's...comfortable to take risks and test things out."

Despite these general feelings of being supported in the school building, other inputs such as macro-level pressures, traditional education structures, and resource allocation were identified as limiters to the operationalization of the vision. Two participants mentioned pressures of accountability, with one referencing the feeling of "responsibility to teach the core curriculum"

and the other referencing the stress of teaching a “high-stakes tested subject.” Another participant felt it was difficult to accomplish the goals of the district vision in a “traditional classroom” where it was “just [them] in a class with 30 students.” The majority of participants also noted the importance of getting additional resources, chief among them being time. One participant noted they would need time for curriculum planning, and another explained they would need time throughout the school day to collaborate with students and help personalize their experiences. Other resources participants said would be helpful were greater financial flexibility to purchase curriculum materials and additional resources to guide lesson planning. Overall, these teachers appear to feel supported by administrators but are also tasked with reconciling a variety of other factors that do not align with the administrative support or with the district vision and, often, limit their ability to operationalize the vision.

Varied Interpretations of the Vision

Participant responses revealed a variety of interpretations of the district vision and of colleagues’ perceptions of the district vision. In general, participants held some consensus regarding the purpose of the district’s vision. Some of these overlapping purposes included it being a vehicle for highlighting the importance of developing the “whole child,” preparing students for success in modern life, and to “open minds” about new approaches to teaching and learning. Most participants also felt they have strong understandings of the two vision documents (PoG and LBs).

However, many identified the vision documents as being “very open to interpretation” or “vague.” One participant explained how “teachers are looking through their own filter, their own experiences, and seeing something different than other teachers.” Another area in which

perceptions differed was in colleagues' understandings of the vision. Some participants felt that their colleagues "really do grasp it," whereas others felt there was "very little understanding." Some believed the teaching staff at the middle school were "already doing it" (i.e., operationalizing the vision), whereas others felt classroom pedagogy in the school was still highly traditional.

One pattern that emerged from the data and that might have been the result of this high degree of interpretability was teachers' needs for reassurance about their understanding. One participant said they would appreciate administrators "reassuring [them] that...this is our vision and even if you have flops and fails along the way, we still support you and your mission." Another participant indicated that they would appreciate a support system to "reinforce, like, you are or you aren't [on track]" and talk about "how it could be better."

Generally High Alignment Between Vision and Teacher Beliefs

Participants indicated their own educational beliefs were fairly well-aligned with the beliefs represented in the two vision documents. One teacher went so far as to say the vision "fits with...these core beliefs that I've had my whole life." Despite participants' perceptions of alignment, there was pushback in some areas. Specifically, multiple participants wondered what the middle school would be giving up if it did fully embrace the vision. Specifically, some participants wondered if there would be space for any traditional methods within this reimagined school, which some students might still benefit from. As one participant put it, "I do sometimes think that we always want to do new and progressive forms of education and sometimes we forget or move away from things that we know are tried and true." Another participant pushed back on the idea that the Profile of a Graduate represents the ideal collection of outcomes for all

students. In their words, “I wish that the Profile of a Graduate highlighted that part of this whole thing is understanding that each individual is different. I think that’s something that is not made explicitly clear here, that we’re not trying to create the same person.”

Perceptions of the degree of alignment between the vision and colleagues’ beliefs was as varied as perceptions of colleagues’ interpretations of the vision. One participant believed that “most teachers support these beliefs and dispositions as being valuable.” Another participant noted teachers objecting in professional development sessions, with some arguing that there was no way to enact the vision while maintaining aspects of the traditional system they viewed as important (e.g. class ranks, test preparation, etc.).

Fear of Change and the Unknown

Emotional responses to the vision and its implications varied, with some participants noting a degree of nervous excitement in themselves and others, as well as feeling overwhelmed with the amount of work required to operationalize the vision. The most prominent collection of emotions participants noted, however, were feelings of fear, stress, and nervousness. In fact, every participant noted one or multiple of these negative emotions when discussing responses to the vision in either themselves or others. For example, one participant explained that, in a learner-centered classroom, “you have to be willing to give up some control and be willing to take that risk, and that can be very stressful.” It is important to note that these negative feelings did not necessarily stem from disagreement about the goals of the vision, but rather the challenge of making it a reality. One participant summarized this well when they said, “I think any time there’s a big unknown and I feel like I’m fumbling through it...it’s not disagreement necessarily, it’s just fear of the unknown.”

Participants also posited reasons for why some teachers might have more negative emotional responses to the vision. One teacher noted their “type-A” personality as a barrier to ceding control to learners. Another also indicated it might depend on the “personality of the teacher.” One participant, who had a more positive affective response to the vision, noted they are comfortable taking professional risks, which has allowed them to experiment more with operationalizing the vision. One notable finding was that participants who felt more positively about this learner-centered change were able to connect it to their own past experiences, whether those were connections to past work experiences or family members who did not thrive in the traditional education system. Lastly, some participants shared their ideas of how teachers in the district have responded. This variety of responses included: (a) teachers deciding they would rather teach the ways they already have their whole career; (b) teachers feeling threatened because they view the vision as a reprimand of their past practices; (c) teachers wanting to be involved in making the change but who are afraid of making mistakes; and (d) teachers already being actively involved in transforming their classrooms.

Uncertainty About How to Operationalize the Vision

All participants were able to conceptualize how their roles would be different in a learning environment that fully reflected the district’s learner-centered vision. These conceptualizations revolved around the idea that teachers would shift from being the “content distributor” or “sage on the stage” to being more of a “coach” or “advisor.” In these new roles, they identified some of their primary duties would be “helping [students] find resources,” “assessing [student] interests and desires,” and helping develop “more well-rounded” individuals rather than focusing primarily on content. Some participants even considered the broader

system-wide implications of bringing the vision to life, such as potentially eliminating age-based grade levels and allowing each student to work at an individualized pace.

However, the current practices and classroom models of most participants did not yet match their perceptions of what a fully learner-centered model would entail. Some participants used the vision documents as guidance for their own curriculum. Others noted integration of elements of the LB and PoG, though multiple teachers noted difficulty with learner agency. No participants claimed to operationalize the vision “fully and holistically,” as one put it. Another participant said, “I’m moving along on that spectrum, but I’m not anywhere near where I want to be.”

One major barrier to complete operationalization was teachers’ struggles to understand how to systematically translate the vision into practice. One participant said, “I think most teachers really feel like they understand a whole about [the vision], but also don’t know what that should look like in their classroom, don’t know how to make that manifest.” Some participants noted that they wanted to or had even tried to completely operationalize the vision, but they worried about how to “do it large scale in a way that [they] can manage and still benefit all of the learners.” Another related barrier was teacher concerns about how to make sure students are still developing what these teachers consider to be core competencies, such as reading and writing, in a learning environment in which students have much greater say in how, when, and what they are learning.

Desire for Collaboration and Experiential Learning

Despite operationalization of the vision currently being limited, all participants expressed at least some degree of readiness to make more significant changes to their classroom models

and practices. One participant said, “I’m full-on prepared” and another said, “I would love to learn more” and they would be “happy to try things.” Even though participants generally indicated their readiness to take on more significant change, there was also some uncertainty; as one participant stated, “I think I’m fifty percent ready...the ability to adapt quickly I think is there, but sometimes you just don’t know what you don’t know.” These responses indicate that these teachers were willing to take on greater roles in creating change, but wanted additional support. This was corroborated by other participants, who identified approaches that would help them make more meaningful transformations to their classroom models and practices.

Multiple participants noted the importance of having opportunities to collaborate. One participant, who has previously had those opportunities, noted that the chances to “dialogue with colleagues and with the administration” helped them develop a “clear perspective.” Another noted that they have had past experiences in professional development sessions in which a colleague’s comments helped them “question [their] own understanding.” A third participant noted that having the chance to collaborate on these kinds of major changes would also make it “far less daunting.” They also noted their desire to collaborate with others who have more experience in this kind of learner-centered transformation. As they put it, “being able to learn from those who have done it is a key thing for me.”

The other support indicated as a necessity by participants was having the opportunity to actually observe and possibly participate in learner-centered environments prior to reimagining their own classrooms. One participant noted that teachers need to “see it in action.” Another shared that “the more we seek out opportunities as a district to get the teachers to see existing models of what it might look like...that can help us all.” A third participant identified the school’s

learner-centered school-within-a-school as a way to learn by “looking at what they’ve done and how they’ve done that and what hang-ups they’ve had and what has really gone well.”

Discussion

This section begins with conclusions drawn from each qualitative and quantitative strand individually. Next is a subsection integrating and comparing conclusions across the data strands, per the convergent parallel research design (Creswell & Plano Clark, 2017). This final section utilizes a systems-based approach based on needs assessment data to understand the variety of factors that influence teaching practices in the district.

Document Analysis Discussion

This document analysis was conducted to answer the research question, “How do policies, plans, and other messages from district stakeholders (i.e., school board, district administrators, and building administrators) support or hinder teacher operationalization of the district vision?” The findings resulted in two key takeaways.

First, it appeared teachers were receiving mixed messages from district stakeholders, creating dis cohesion that complicated change processes (Cohen et al., 2018). For example, the district website emphasized the importance placed on cultivating the holistic growth of the learner, but school board policy encouraged narrowly focused learning standards and middle school policy emphasized academic achievement over other forms of student accomplishment through the honor roll policy. This example also reflects an important distinction: the difference in degree of alignment between formal policies and stated ideals. Although there were policies created by the school board and middle school administrators aligned with LCE, both of these groups also created policies misaligned to LCE. In contrast, all of these stakeholders’ stated

ideals (e.g., development of the whole child, personalized learning experiences, etc.) were aligned to LCE. To understand this discohension, it is also important to consider the district timeline. In that regard, it is interesting to note that the school board policies, two of which were misaligned with LCE, were adopted in 2017, after the district created its learner-centered vision. This would seem to suggest that the stated, learner-centered ideals of the district had not yet seeped into all policy decisions. The research design for this data strand limited my ability to make causal claims, but there are some feasible explanations for the contrast between district policy and the district's stated ideals. For example, one possible reason is that district administrators were held accountable for policy decisions by other stakeholders, such as the local, state, and federal governments, whereas district administrators were free to espouse ideals without concern for these mandates and other such factors. Similarly, it is easier to state a belief than to enact it on a daily basis, which is likely part of why the development of ideas pertaining to learner-centered education, such as the district's vision of teaching and learning, were outpacing the operationalization of learner-centered education in classrooms (Gross et al., 2018).

The second key conclusion from this document analysis is that there was little, if anything, in these documents that could have served as an effective resource to help teachers consider specific ways in which they might operationalize LCE and the district vision in their classrooms. For example, in the school board policy about alternatives to the traditional course sequence, the option for students to design independent study opportunities was conceived as a shared responsibility of learners and their caregivers. There was no mention of the role classroom teachers could play, such as by joining in the design process of these opportunities. Relatedly, none of the documents or document sections analyzed referenced the fifth principle of

LCE: shared responsibility for learning between the student and teacher. Documents related to this principle would have likely provided guidance regarding the ways teachers could interact with learners to support operationalization of the district vision. Understanding why these different stakeholder groups did not provide concrete guidance as to learner-centered best practices for teachers falls outside the scope of this analysis. However, one possible explanation is that these stakeholders did not want to violate the teacher cultural norm of autonomy or insult their professional expertise by recommending practices teachers should use. Relatedly, these stakeholders might have been aware of the variability of teachers' readiness for the kinds of learner-centered innovations envisioned by the district, leading these stakeholders to hold off on the kinds of specific recommendations for teaching that might have alienated those teachers who were not yet ready for this change. Another possible explanation is that these stakeholder groups had not actually conceived of how their stated ideals might be operationalized in the classroom, leaving that responsibility to teachers. Returning to the research question, it seems likely that mixed messages from district stakeholders, particularly misaligned policy, as well as the lack of guidance regarding approaches to operationalizing the district vision, were factors contributing to the problem of limited learner-centered innovation in classrooms.

One potential weakness in this research design is that there are likely a variety of other policies and messages not captured in the documents publicly available on the district website. For example, the impact of in-person interactions and other forms of communication not present in recorded documents could not be accounted for in this analysis.

Survey Discussion

This survey was designed to answer the research question, “To what extent do teachers hold learner-centered beliefs and utilize learner-centered practices in their classrooms?” Overall, the measures of frequency, central tendency, and variation indicate teachers’ beliefs and practices are moderately aligned with LCE. However, the distribution of responses also indicates that at least some participating teachers held a mix of both learner-centered and non-learner-centered views. Specifically, the distribution of responses regarding non-learner-centered beliefs about pedagogy indicates beliefs about teaching and learning were where there was the least consensus among responding teachers.

Based on this mix of beliefs, it seems somewhat surprising that every participant indicated they use all of these learner-centered practices at least sometimes. Though this result can be taken at face value, it is also possible that this reflects potential inaccuracy in self-perceptions of practice. As indicated by previous research, there can be misalignment between teachers’ reported practices and their actual practices (Polly & Hannafin, 2011), as well as differences between teachers’ self-perceptions of their use of learner-centered practices and their students’ perceptions of these teachers’ use of learner-centered practices (McCombs et al., 1997).

If teachers had been utilizing some learner-centered practices with the frequency indicated in survey responses, one could conclude it is possible for learner-centered practices to be incorporated into traditional classroom models, since classrooms in the district still generally reflect the principles and structures of the traditional education system. This explanation would

expose a way in which teachers could intentionally or unintentionally sidestep the second order systemic change (Perla et al., 2013) and innovation encouraged by the district vision.

This incorporation of learner-centered practices within traditional classroom models also speaks to a limitation of the ALCPS questionnaire and the importance of distinguishing between frequency of use and depth of operationalization. The ALCPS questionnaire items were developed to identify the frequency with which teachers utilize specific learner-centered practices but not the degree to which these practices have been operationalized. This questionnaire cannot accurately measure the depth of operationalization because it is possible to interpret questionnaire items in terms of either first order or second order change. For example, when participating teachers reflected on how frequently they have encouraged learner agency, they might have been considering actions such as asking students to share their beliefs on a topic during a teacher-led lecture, an example of a first order change, or something as profoundly and systemically learner-centered as allowing students to individually select the next unit of study they will pursue in that class, an example of second order change. The ambiguity of this questionnaire regarding depth of operationalization means respondents were able to interpret each item through their existing frame of reference, whether or not that frame of reference was primarily learner-centered. In sum, this survey indicated moderate agreement with learner-centered beliefs and moderate use of learner-centered practices, there are limitations of this questionnaire in helping to unearth the depth with which learner-centered practices have been operationalized and, by extension, the extent to which classrooms have truly been transformed to reflect LCE.

Interview Discussion

This data strand was used to answer RQ3: “How do teachers perceive their professional context and their professional roles and identities, particularly in light of the district's vision for teaching and learning?” Due to the semi-structured nature of the interviews and the emergent design of qualitative research (Lochmiller & Lester, 2017), many of the interview sessions also shed light on other research questions as well. These interviews led to several key takeaways, one of which is the highly varied interpretations of colleagues’ understandings of and responses to the district vision. One important factor causing these varied interpretations was likely differences in teachers’ social networks (Coburn et al., 2013), specifically the makeup of teachers with whom each participant shared social ties.

These varied interpretations applied not only to perceptions of colleagues but also to participants' own interpretations of the vision. The apparent open-endedness of operationalizing LCE as outlined in the district vision appeared to have caused significant stress responses in most participants, ultimately leading to a desire for collaborative and experiential learning regarding LCE. These responses were likely influenced by the responses of colleagues in the teachers’ social network as well as individual characteristics, with participants specifically noting the importance of personality traits and one’s collection of past professional experiences.

Lastly, teachers perceived themselves as incorporating various degrees of operationalization. No participants believed they had fully achieved the ideals of the vision. This indicates that, although the vision was described as vague, teachers were aware that the desired outcomes of operationalization are significant, second order changes in the classroom.

The findings from this phase of the study were valuable for designing an effective intervention. However, there were some limitations that must be considered. First, this data was drawn from a collection of qualitative interviews, and these findings are not necessarily generalizable to the broader population of teachers at the middle school, the entire district, or the theoretical population of K-12 teachers in similar school contexts. Still, there is some indication that these findings corroborate past studies outlined in Chapter One, such as the finding that learner-centered education is interpreted very differently by different people.

Integrated Discussion

This integrated discussion was designed to help answer the fourth and final research question: *How do these data strands converge, diverge, and supplement each other?* The process of integration began with the integrated visualization of all data strands (Creswell & Plano Clark, 2017) (see Figure 2.2), which revealed patterns, connections, and potential contradictions across data strands. Conclusions were organized by the networked system levels based on the work of Neal and Neal (2014) and the resulting conceptual framework established in Chapter One, as represented in Figure 2.2.

Administrative Actions and Organizational Characteristics

The organizational context of the district appeared to play a significant role in teachers' perceptions of the district vision and their motivation and ability to implement it. As identified in the document analysis, teachers were receiving mixed messages, particularly due to dis cohesive (Cohen et al., 2018) policy at both the macro and district levels. Additionally, there was little operational guidance for teachers in the documents analyzed for this study. This kind of guidance has been identified as vital for the process of operationalization (Ballet & Kelchtermans, 2008;

Ketelaar et al., 2012; Vähäsantanen, 2015). Operational guidance would be particularly useful in this context because, as interview participants noted, the district vision and its implications for practice are open to a high degree of interpretability. This high degree of interpretability appears to be common in learner-centered reforms (An & Reigeluth, 2011). In these same interviews, some participants corroborated this need for guidance explicitly. This high degree of interpretability and the dearth of operational guidance also created a need for extra time for teachers to make sense of the vision on their own, time which teachers indicated they did not currently have in their daily work routines. This need for time corroborates previous studies (An & Reigeluth, 2011; Colley, 2012).

Response of Other Teachers to the Reform

Teachers' social networks, specifically the responses of members of their social groups to reform, influence the perceptions of teachers (Le Fevre, 2014; Siciliano et al., 2017). As such, it was important to consider how teachers' colleagues in the district were responding to the district vision. Interview data revealed that teachers had varied perceptions of colleagues' understanding of and responses to the district vision. There are a number of factors that could have led to these varied perceptions of colleagues' responses, such as the high degree of interpretability of the vision, which allows each teacher to make their own meaning of it. These varied perceptions of colleagues' responses were also likely due to differences in teachers' social networks, which would indicate that teachers and their social groups were responding to the vision differently. These different responses were potentially a result of the dynamics of particular teacher networks and to individual characteristics of the teachers comprising these groups.

Individual Teacher Characteristics

Teachers' professional beliefs and personality traits were both explored in this needs assessment. Regarding teachers' beliefs, survey results and interview findings were somewhat misaligned, though they do not appear to be completely divergent. The survey indicated teachers' beliefs are moderately aligned with learner-centered education, with teachers holding a mix of both learner-centered and non-learner-centered beliefs. Interviews indicated a slightly higher degree of alignment between teachers' beliefs and LCE. There are a number of potential explanations for this difference, such as (a) differences across samples for each strand, (b) interview responses being influenced by social desirability bias since they were not anonymous, (c) potentially limited content validity of the survey, or (d) researcher bias in interpreting interview transcripts. Overall, the variety of beliefs, both within and across participants, reflected the individualized approaches all teachers take to making meaning of their professional lives, and this individual process and resulting actions are influenced by teachers' personalities, as noted by interview participants.

Teacher Perceptions of Reform

Despite these varied beliefs and personalities of teachers, interview participants indicated generally positive perceptions of the vision and the goals it outlines for district graduates. There was, however, concern amongst some about moving away from previously established best practices in the name of innovation. Additionally, participants had wide-ranging interpretations of how to operationalize the vision, corroborating previous findings (Ballet & Kelchtermans, 2008). Some also noted their own uncertainty about what the implications of the district vision actually were. This finding again indicated the importance of guidance for this operationalization

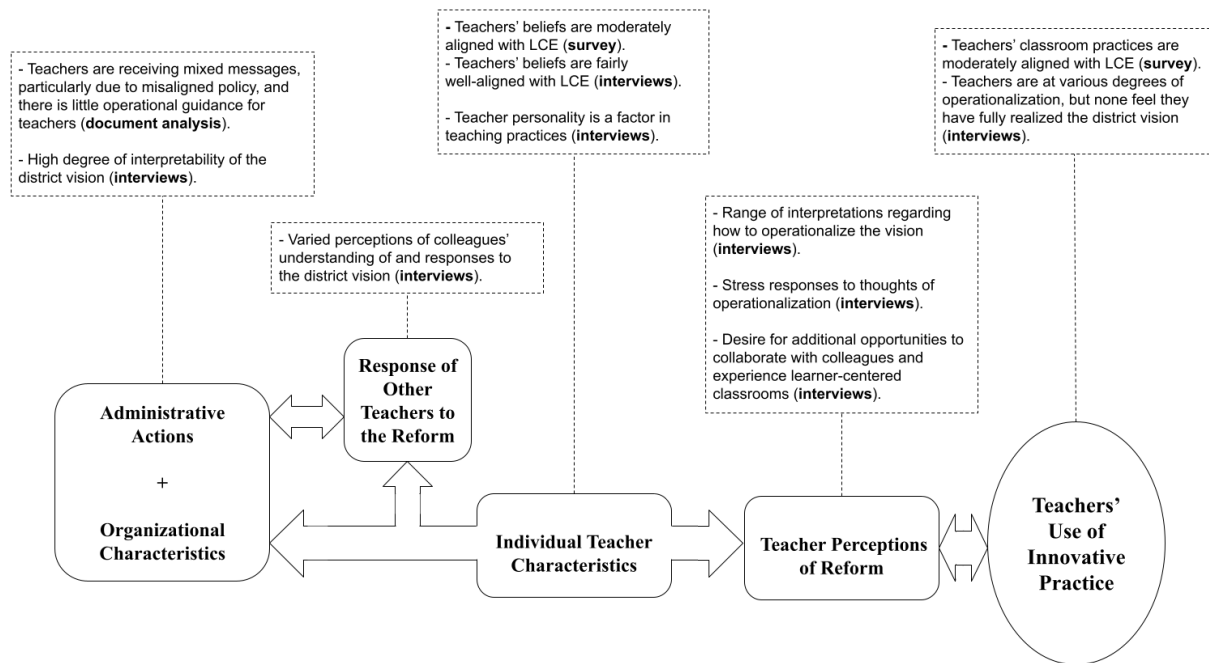
process as a means to build shared understandings and cohesive practices. One response shared by most participants was stress about the process of operationalization, which appeared to be rooted in a more general fear of change and the unknown that is often found in school change processes (Helpap & Bekmeier-Feuerhahn, 2016). This response indicated that, even though many teachers agreed with and believed in the district's vision, the perceived professional risk (Le Fevre, 2014) and the challenging work involved in transforming long-standing educational models were sources of friction in operationalizing learner-centered innovations in classrooms. This backdrop is the likely reason multiple interview participants noted a desire for additional opportunities to collaborate with colleagues through this process and to gain first-hand experience in existing learner-centered classrooms.

Teachers' Use of Innovative Practice

The survey results indicated that teachers' classroom practices were moderately aligned with LCE. This finding was corroborated through interviews, which revealed that teachers were at various degrees of operationalization, but none felt they had fully realized the district vision. One important consideration that can be extracted from these results is the fact that operationalization of learner-centered practices as a complete, cohesive system requires an ongoing process of change. Therefore, operationalization appears to be best conceptualized as growing incrementally, with one's collection of practices falling somewhere on the continuum from completely traditional to completely learner-centered.

Figure 2.2

Integration of Data Strands



Summary

This needs assessment painted a more detailed picture of the district context and the factors limiting operationalization of the district vision. Teachers' practices fell along various points of the continuum between instructionist and learner-centered, but no participants in this study felt they had fully realized the district vision. Their use of learner-centered innovations were influenced by their professional networks, their own personality and beliefs, and their understanding of and stress response to the district vision. In order to operationalize the district vision and learner-centered innovations, these teachers needed guidance, time, opportunities to collaborate, and first-hand experiences in learner-centered classrooms.

Chapter 3

Intervention Literature Review and Initial Development

Needs assessment results and findings suggested teachers in the district needed support in operationalizing the district's learner-centered vision. Specifically, it was identified that the district's learner-centered vision had not been fully realized in any classrooms. This problem was influenced by a variety of factors including teachers' professional networks, character traits, and understanding of and stress response to the vision and its implications for practice. This chapter explores approaches to interventions that have theoretical and empirical support.

To address this problem of limited operationalization of the district vision, I determined professional learning (PL) as an effective means of accelerating operationalization of innovative, learner-centered classroom systems. PL was selected because the informal, non-systematic learning strategies for teachers the district had been using were ineffective, as indicated by the needs assessment. These findings corroborated prior research. Bakkenes et al. (2010) found teachers who were engaged solely in informal learning regarding educational innovations more often had negative emotional reactions, did little experimenting, and returned to prior classroom practices, whereas systematic PL experiences cultivated experimentation, new idea generation, and fewer negative emotional reactions to the innovations. As such, this chapter first explores sociocultural framework for learning and behavioral change, followed by a review of literature regarding effective PL and the components that comprise it, PL models that align with the needs of teachers in the district context of this study and the chosen framework, and finally an initial proposal for a professional learning intervention.

Theoretical Framework

Teaching involves both bodily and cognitive interaction between at least two minds and brains (i.e., the teacher and learner). As such, the cognitive processes of teachers must be understood in order to improve education (Rodriguez, 2012). Additionally, the task of transitioning to a learner-centered model requires significant changes to teachers' practices as they become facilitators whose primary jobs are supporting student knowledge construction (Bakkenes et al., 2010). For these reasons, this section focuses on theories pertaining to sociocultural learning and self-efficacy. These theories were used to develop a framework that guided formulation of an effective intervention for district teachers who participated in the strenuous cognitive and affective process of transforming educational practices.

Sociocultural Learning Theory

Sociocultural theory was originally proposed by Vygotsky (1978) and highlights the social, experiential nature of learning. Since the initial development of this theory, the label of "sociocultural" has expanded from referencing Vygotsky's theory and is now used as a general term for all approaches to learning that emphasize collaboration and active learning (Gee, 2008; Perry, 2012). In the context of teacher professional learning, Raphael et al. (2014) propose five key principles of a sociocultural approach. They argue a PL experience framed with sociocultural learning theory must (a) provide significant agency for the learner, (b) be contextualized in authentic settings and scenarios, (c) involve collaborative discussion, (d) be systems-oriented, and (e) be sustained over time.

Self-Efficacy Theory

Self-efficacy theory, first developed by Bandura (1986) and elaborated in the context of education by Tschannen-Moran and Chan (2014), was also used to frame development of this PL experience for participating teachers. Self-efficacy can be understood as an individual's domain-specific beliefs about their abilities to complete a desired task. For example, teacher self-efficacy includes teachers' beliefs in their abilities to complete tasks such as managing a classroom or effectively motivating students. These teacher self-efficacy beliefs have been conceptualized as playing a role in teachers' action or inaction regarding curriculum reform (Tschannen-Moran & Chan, 2014). One example of such curriculum reform is the operationalization of the district's learner-centered vision.

Bandura (1986) conceptualized four factors that influence changes to an individual's self-efficacy. First, verbal persuasion, or encouragement, can have a meaningful influence on how the individual receiving the encouragement perceives their abilities. Second, vicarious experiences are experiences that allow individuals to observe others they see as similar to themselves succeed in performing the desired task or tasks. Third, mastery experiences are past attempts at completing the desired tasks that individuals perceive as having been successful. These perceptions of past success act as a form of evidence that cultivates individuals' beliefs that they will be able to successfully perform these same tasks in the future. Last, physiological and affective states influence self-efficacy by providing physiological and psychological feedback to individuals as they imagine completing tasks. These states can be positive or negative, thus influencing self-efficacy accordingly. Applying this theory to education and professional learning around educational innovations, PL experiences must be designed to

support the continuous development of teacher self-efficacy for the tasks required so teachers have the necessary beliefs to enact change.

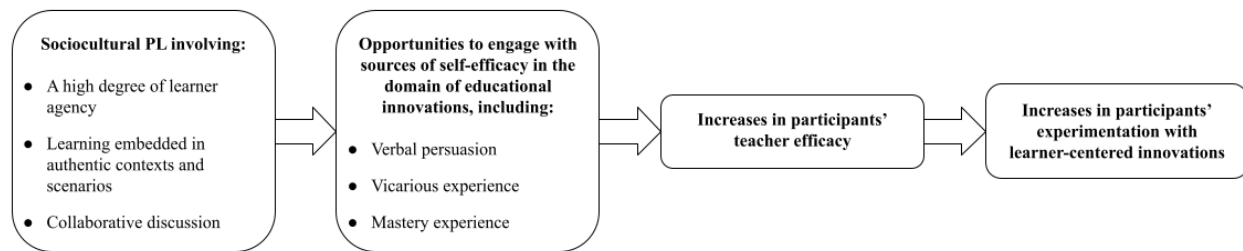
Implications of the Theoretical Framework

The first three principles of sociocultural PL proposed by Raphael et al. (2014) are particularly valuable for understanding how one can develop PL interventions, as they align with the sources of self-efficacy proposed by Bandura (1986). For example, the sociocultural principle of dialogical learning reflects opportunities for verbal persuasion which, in turn, can increase teacher self-efficacy. Additionally, there is empirical evidence that teacher self-efficacy is correlated to innovative work behaviors (Hsiao et al., 2011), such as the operationalization of learner-centered innovations in classrooms.

Based on this theoretical framework (Figure 3.1), I began by broadly considering approaches to professional learning that would effectively support the sociocultural learning processes of district teachers as they experimented with learner-centered innovations. Through collaborating with others in active learning, I deemed it feasible for participating teachers to increase their self-efficacy to cultivate ongoing operationalization efforts. Additionally, I conducted a two-pronged analysis of empirical studies to explore the particularities of such an approach and ensure the broad conclusions borne from the data. This analysis included a contemporary understanding of effective professional learning in general and professional learning specifically designed to alter teachers' educational beliefs and practices. This theoretical framework bridged these prior studies and my decision-making process regarding intervention design for district teachers.

Figure 3.1

Theoretical Framework for Sociocultural Professional Learning Experiences



Literature Review

The following literature review begins by uncovering modern understandings of effective PL, indicating how these reflect sociocultural perspectives that cultivate opportunities to build teacher self-efficacy. From that foundation, the literature review builds with a focus on PL approaches that are supported by the established framework (Figure 3.1) and existing research.

Contemporary Understandings of Effective Professional Learning

Effective professional learning has been defined as structured learning experiences for teachers that help them revise their practices to improve student outcomes (Darling-Hammond et al., 2017). Other PL interpretations focus more on teachers' perspectives on experiences they find useful and engaging (Bayar, 2014; Noonan, 2018). Both of these approaches to understanding effective PL are important to consider when discussing best practices in professional learning.

Due to the multiple ways in which effective PL is defined, perspectives vary on the specific components necessary for effective professional learning (Bayar, 2014). However, research indicates that traditional, transmission style PL experiences are largely ineffective (Johnston et al., 2019; Knapp, 2003; Penuel et al., 2007). Broadly accepted elements of effective

PL include active learning, collaboration, and connection to teachers' actual professional contexts of their classroom and schools. These elements are all aligned with the sociocultural perspective and adult learning theory. To better understand effective professional learning and some of its constituent components, I reviewed a variety of conceptualizations of effective PL to show the current state of thinking and research regarding teachers' professional learning.

Borko et al. (2010) proposed a list of essential qualities of effective PL based on their analysis of the literature. Through this process, they determined that effective PL generally includes (a) a focus on the authentic context in which the learning will be applied and the ultimate goal of improving student learning; (b) modeling of the desired learning outcomes, active learning opportunities, collaboration in a learning community, and embeddedness in the school or classroom context; and (c) ongoing activity and participation. Though the authors chose from a very limited number of existing professional learning frameworks to synthesize their own, their identified elements align well with the work of Darling-Hammond et al. (2017), who reviewed many rigorously designed empirical studies to devise their framework.

Through their synthesis of 35 studies, Darling-Hammond et al. (2017) identified seven key principles they believe support effective professional learning. First, they have argued PL should be content focused, meaning it specifically addresses the subjects and topics the teacher teaches. Second, PL should involve active learning, in which participants are able to engage in authentic, contextualized learning experiences that reflect how they can apply this learning in their day-to-day work lives. Third, PL should involve collaboration among individuals involved in the PL experience to support learning. Fourth, effective practices should be modeled to illustrate high quality implementation of the ideas, skills, and strategies of interest. This

particular element was one that every study in this meta-analysis included. Fifth, PL should include coaching and help from experts, who can provide personalized support to address the individual needs of participating teachers. Sixth, there should be built in opportunities for feedback and reflection for participants, which help participants revise and improve practice. Finally, the PL experience needs to occur over a significant span of time, rather than being a single event that occurs in one or several concurrent days. This longer time frame often occurs through cycles of workshops and application of learning in teachers' classrooms. Although not all studies included all of these elements, they all included multiple elements, which the authors contend is what made them effective. In addition to these seven elements, the authors also highlight the importance of designing PL experiences in which participating teachers' needs are addressed and in which participating teachers have a say in the experience.

One criticism noted by the authors themselves is the lack of explanation for why certain studies that met many of their criteria for effective PL turned out to be ineffective in practice. The authors have proposed potential obstacles, such as low implementation fidelity, but this requires further study in order to be adequately understood. Another criticism, this one applying to the work of both Borko et al. (2010) and Darling-Hammond et al. (2017), is both groups of researchers might have underemphasized the opinions of potential participants in terms of what actual teachers believe would be engaging and meaningful for their professional learning.

Bayar (2014) fills this gap in the research. In this study, Bayar sought to better understand the professional learning preferences of elementary teachers in a large Turkish city. These teachers represented a variety of schools and all had at least three professional learning experiences in the past twelve months. Bayer triangulated data from teacher interviews,

open-ended questionnaires, and document analysis to identify a variety of elements teachers preferred in their PL experiences. These elements included a match to the needs of teachers and the school context, teacher involvement and active participation in both the design and enactment of the PL experience, ongoing experiences that did not end after a single workshop, and skilled facilitators.

There are, however, some important limitations in Bayar (2014). First, regarding participant recruitment, Bayer does not indicate if all teachers with three recent PL experiences were included, or if the total number that fit that criteria were further reduced based on another factor. Without knowing the selection process, it is difficult to determine if the validity of this study has been compromised due to selection bias. Next, there are few details regarding the researcher's coding process. Lastly, the context in which this study occurred includes some features that might not translate to an American setting, such as cultural differences or the fact that participants' PL experiences in this study were designed and facilitated by Turkey's Ministry of National Education instead of by stakeholders in the school systems, such as administrators. Despite these limitations, the results indicate alignment between the desires of teachers and the PL frameworks explicated by Borko et al. (2010) and Darling-Hammond et al. (2017).

A study by Noonan (2018), which adds critical nuance to the previous articles about effective PL, explored teachers' PL preferences with a focus on the mediating factor of teachers' professional identity and beliefs. In this study, the author conducted a phenomenological inquiry by interviewing 25 K-12 teachers and asking them to reflect on the PL experiences that were most impactful for them. Interviews lasted 45-90 minutes and were immediately followed by a full transcription and initial memoing. Though the methodology used in this study was

well-articulated and executed, Noonan notes that this data is cross-sectional, eliminating the potential to see how the dynamic process of identity construction through time might factor into these results. Still, the results provide an important counterpoint to the idea that there is one single approach to PL that is best for all teachers.

Through analysis of the interview data, Noonan (2018) determined that there was no single kind of PL experience all teachers preferred, though some groupings did arise. Some teachers preferred more traditional, transmission-based professional learning, particularly teachers who identified strongly with the content of the subject they taught. Other teachers preferred PL experiences with charismatic and skilled facilitators, particularly those who saw teaching as a performative act. Finally, many teachers (13 of the 25 total) preferred collaborative PL experiences, in which they were able to learn from and with teaching colleagues. This was especially true for teachers who were more socially- or community-oriented. This study fills a gap in the literature by identifying the mediating effect of professional identity on teachers' PL preferences. For example, Darling-Hammond et al. (2017) noted some of the studies fitting their criteria of effective PL did not have the intended positive impact when implemented. Thus, determining identity as a mediating factor is one step in understanding why even PL experiences built on identified best practices will not always have the desired effect on all teachers in all contexts.

The principles of effective professional learning developed across these various groups and researchers can also be framed with self-efficacy theory and the sources that influence self-efficacy. Coaching and other forms of leadership can serve as a source of verbal persuasion, in which participants are assured that they are able to develop proficiency with the skills

necessary to complete desired tasks. Teacher collaboration allows for vicarious experiences in which one teacher can observe another teacher's successes, thus building the observing teacher's self-efficacy. Active learning allows participating teachers to practice completing desired tasks. In conjunction with participant reflection, teachers can recall experiences in which they successfully completed desired tasks, thus improving their self-efficacy to complete those tasks in the future. To better understand these principles, the following sections highlight empirical studies involving each to allow for a deeper examination of their effectiveness in use.

Supporting Teachers in the Change Process

The following review of interventions includes those broadly identified with the goal of promoting teacher operationalization of innovative approaches to teaching and learning, and align with the theoretical framework (Figure 3.1) as well as the tenets of effective PL identified in previous sections. For organizational purposes, the selected studies were grouped into several broad categories: situated, experiential PL, collaborative PL, and personalized, learner-centered PL. Although these studies were categorized as stated, many of these studies could be assigned to multiple categories. In those cases, I chose the category that was predominantly reflected in the PL design of each study.

Situated, Experiential Professional Learning

Generally, situated and experiential learning involves learners developing their knowledge and skills in the context in which those knowledge and skills are applied (Brown et al., 1989). In terms of teacher PL, it can refer to teachers working to integrate what they are learning in PL into their own classrooms or using the classroom itself as their learning environment (Camburn & Seong, 2017). For example, the PL experience could take place

outside of the classroom, but the goal of the PL experience would still be to consider applications of that learning to the classroom context. Alternatively, the PL experience could take place in a live classroom context with students present. Girvan et al. (2016) identify experiential professional learning as involving three steps: action, reflection, and generalized abstraction of underlying, transferable principles. Importantly, the situated, experiential approach has been identified as a significant predictor of actual changes in teachers' approaches to teaching and learning (Penuel et al., 2007).

There are a variety of ways in which PL can be built on the principles of situated, experiential learning. For example, Orrill (2001) provided one-on-one debriefing and reflective questioning meetings after observing participating teachers enacting innovative lessons in their own classrooms. In a study by Girvan et al. (2016), there were three phases: (a) observation of someone else implementing the innovation, (b) individual and group reflection on the observation and one's own practices, and (c) design/implementation of one's own version of the innovative approach. Some intervention designs do not involve direct experimentation in the classroom, but instead focus exclusively on the reflective component, with the ultimate goal of this self-reflection leading to changes in practice. For example, Blumberg (2016) applied a rubric she had previously developed to assess professors' use of learner-centered practices. The evaluation process revolved around one-on-one interviews in which participating professors reflected upon the degree to which they used each learner-centered approach. During the interviews, the interviewer also provided suggestions for how to be more learner-centered.

These studies indicate that the most common outcome of situated, experiential PL is increased likelihood of critical reflection of practices (Camburn & Seong, 2017). In addition to

this being highly aligned to my chosen theoretical framework, Kim et al. (2013) suggest, based on a synthesis of prior research, that in order to change teachers' beliefs, it is beneficial to cultivate reflective experiences that allow teachers to examine and revise their educational beliefs. Through reflection, some teachers were able to identify the changing role of the teacher in a learner-centered classroom and acknowledged they had made the transition to learner-centered approaches (Girvan et al., 2016). Opportunity for reflection was noted by some as the most critical element of professional learning for helping them stay engaged, keep improving their teaching, and questioning their own beliefs (Orrill, 2001). Some reflective tasks can also serve as explicit learning opportunities when reflection is supported by a facilitator, or, using the parlance of sociocultural theory, a more experienced other. For example, participants in Blumberg's (2016) study noted that the interviews in which they participated, which also involved the interviewers providing suggestions for how participants could be more learner-centered, served as a reflective activity that would lead them to change their teaching practices. In addition to situated, experiential PL facilitating self-reflection, it also appears to support ongoing professional learning after the conclusion of facilitator participation, likely because situated, experiential learning is already so deeply embedded in participant's professional contexts (Girvan et al., 2016). It is important to note, however, that this was only the case in schools that had a high degree of administrative support for the innovation.

Because situated, experiential PL is, by nature, embedded in participants' professional contexts, this approach to PL is often collaborative, allowing participants to interact with others in their contexts. Participation in situated, experiential professional learning can even support organic development of communities of practice (Girvan et al., 2016), one specific form of

collaborative PL. The next section of this literature review specifically focuses on communities of practice and other forms of collaborative PL.

Collaborative Professional Learning

Collaborative PL involves the integration of social interaction into the learning process. Collaborative PL can take different forms, including communities of practice and peer coaching. Communities of practice (CoP) have been defined as “groups of people who share a concern, a set of problems, a passion about a topic and who deepen their knowledge and expertise in that area by interacting on an ongoing basis” (Wenger et al., 2002, p. 4). Peer coaching can involve both reciprocal coaching in which teachers help each other, and unidirectional coaching in which one teacher with more experience in the subject helps a teacher with less experience (Kohler et al., 1997; Ma et al., 2018). A variety of collaborative approaches have been found to support teachers in their processes of adopting educational innovations (Goodyear et al., 2014; Penuel et al., 2007).

Regarding intervention design, variations exist across studies. Licklider (1995) utilized peer coaching cycles so teachers could receive feedback from and provide feedback to teaching colleagues to improve the use of a complex teaching technique (questioning) in their classrooms. Kohler et al. (1997) also utilized an approach identified as peer coaching but which emphasized unidirectional coaching. As noted above, these collaborative approaches are well-aligned with situated, experiential approaches. Orrill (2001), for example, helped participating teachers develop a community of practice within their professional context that allowed participants to discuss and reflect on their situated learning experiences implementing innovations in their classrooms. Collaborative learning can be combined with other approaches as well. In one study,

participants used a combination of computer-based personalized learning and peer coaching to design, revise, and implement an innovative lesson plan (Ma et al., 2018).

These collaborative approaches have resulted in a multitude of benefits across studies. Peer coaching can lead to higher degrees of participation in the PL itself (Ma et al., 2018), as well as improvements in teacher utilization of complex teaching strategies, teaching efficacy regarding that strategy, and perceptions of collegial relations and professional growth (Licklider, 1995). Kohler et al. (1997) even noted that peer coaching in their study resulted in adoption of instructional innovations which were largely maintained after peer coaching sessions concluded, indicating the lasting impact of the approach. Communities of practice have been shown to help teachers develop more positive views of the innovation (Akerson et al., 2009) and form group identities around use of an innovative pedagogical model (Goodyear et al., 2014), an important consideration when taking into account how a teacher's professional identity influences their pedagogical choices (Keiler, 2018). Collaboration in general has been identified as particularly effective for increasing teacher engagement in reflective practice (Camburn & Seong, 2017).

Orrill (2001) emphasizes the potential value of collaboration amongst teaching colleagues, noting the influence teachers have over each other when engaging in professional learning experiences. Regardless of the rationale, this collection of studies empirically supports the value of utilizing collaborative approaches. Another approach that has been found to be efficacious is creating personalized, learner-centered PL experiences.

Personalized, Learner-Centered Professional Learning

Personalized, learner-centered learning, in the context of teacher professional learning, can be understood as the process and goal of tailoring each teacher's experience to their unique

needs and interests, often with their input and supporting technologies (Bingham et al., 2018; Reigeluth et al., 2017). Additionally, a personalized approach is important to consider because not all teachers learn best in the same ways (Bakkenes et al., 2010; Noonan, 2018), and contextual factors influence the specific learning experiences that will be most effective for participants (Penuel et al., 2007). Prior research has indicated the efficacy of such an approach.

Effective approaches to personalized, learner-centered PL have taken a variety of forms. Lee (2005) involved teachers in a year-long PL program in which workshops and on-site activities were formulated with consideration for teachers' self-identified needs regarding content knowledge, pedagogical content knowledge, meeting students' needs, and new education policy. Though teachers were not involved in making decisions in each step of the process, their initial involvement was essential for designing the PL program. Other approaches, like that utilized by Gamrat et al. (2014), allow teachers to make key decisions throughout the entire process. In their study, teachers had opportunities to select the PL resources most aligned to their goals. Key elements of their approach included initial and emergent goal setting, digital badging, teachers self-selecting the evaluation of their progress, and feedback/assessment from regional mentors. Another form of personalized, learner-centered PL is one-on-one support from a more experienced other. For example, Hoekstra and Korthagen (2011) provided a year of direct supervision for a teacher interested in adopting educational innovations related to learner-centered practices (e.g. self-regulation and knowledge construction). They utilized a multi-level learning approach to help the participant address the cognitive, affective, and motivational components of learning. Hannafin and Polly (2011) modeled learner-centered

practices in their PL sessions so teachers could gain experience as learners in the kind of model these teachers were asked to adopt.

Results across studies have indicated positive effects from personalized, learner-centered approaches to PD, and there is evidence indicating it is more effective than traditional, lecture-based PL experiences (Penuel et al., 2007). Benefits include teachers reporting less fear around adopting innovative approaches. Additionally, results have suggested that personalized, learner-centered PL leads to teachers becoming more learner-centered (Lee, 2005). Gamrat et al. (2014) noted that personalized goal setting was found to help teachers stay productive and inform their decision-making throughout the PL experience. Lastly, Polly and Hannafin (2011) have provided evidence about the importance of learner-centered PL experiences as a means of modeling LCE for participating teachers. In interviews with teachers, they identified low alignment between teachers' espoused learner-centered beliefs and actual, enacted learner-centered practices. Specifically, many participants claimed to enact learner-centered models when they did not. For this reason, the researchers modeled LCE in their designed PL experience, which led to increases in participants' enactment of the modeled learner-centered practices in their own classrooms.

Key Implications from the Research

All of the approaches to professional learning included in the prior sections have been shown to be effective. Results from some of the studies noted above indicate that reform-like PL is more effective than traditional, lecture-based PL (Camburn and Seong, 2017; Penuel et al., 2007). Additionally, there are more specific implications from the studies presented in this literature review that supported the design of the PL experience in the district.

First, goal setting has been identified as an effective means of prompting reflection (Gamrat et al., 2014). Reflection may also be prompted through purposeful questioning from the facilitator (Blumberg, 2016). Second, it is important to avoid overwhelming participants with content and resources (Orrill, 2001); generally, it is important to make it as easy as possible for participants to participate. Therefore, facilitators should make the transition into the PL experience as seamless and low-stress as possible. This appeared to be effective for Goodyear et al. (2014), who leveraged the communication channels already used by teachers in their context as a means of communication among participants to form a community of practice. Another approach to reducing the likelihood of overwhelming teachers while promoting engagement is providing participants with opportunities to influence the design of the program, as recommended by Lee (2005). This idea highlights the broader importance of social support for participating teachers (Hoekstra & Korthagen, 2011; Orrill, 2001), particularly over an extended period of time, such as that provided by Goodyear et al. (2014) and Polly and Hannafin (2011). Lastly, it appears important to consider the experience level of the PL facilitator. For example, in Hoekstra and Korthagen (2011), the facilitator was experienced in using the multi-level learning approach, which he developed. As someone who has not facilitated a formal PL experience before, I had to consider which approach was best suited to my existing skill set or what competencies I could reasonably develop prior to beginning the intervention that would allow me to adequately support teachers as they began the PL experience.

Formalized Approaches to Effective Professional Learning

In addition to the contemporary understandings of effective PL outlined previously, there are several formalized approaches to PL through which these best practices can be organized and

enacted. In this case, formalized approaches refer to approaches that have been defined and are widely understood by name. This section explores two promising PL approaches in the context identified as being relevant for designing the PL experience for the district: lesson study and continuous improvement.

Lesson Study

Lesson study is an approach to PL developed in Japan that can be used to explore new approaches to education in addition to identifying new curricular content and sequencing (Hart et al., 2011). It is conceptualized as a way of developing teacher knowledge and skills, teacher commitment and community, and learning resources that can be used in future lessons (Murata et al., 2004; Triwaranyu, 2007). There are several steps of the basic lesson study design (Hart et al., 2011; Vermunt et al., 2019). First, a group of teachers determine an area of need regarding student learning, broadly defined (i.e. not specifically directed towards standards-based knowledge and skills). This focus on student learning is the through-line of all steps in the process. There is no definitive size for this group, though three to seven members has been proposed as an ideal range (Triwaranyu, 2007). Ultimately, the selected group size should be manageable for collaboration purposes and fit the needs of participants and the context. Second, the group uses that goal to develop a research lesson. This lesson plan can serve as a way of making ideas concrete for participating teachers. Third, a member of the group enacts the research lesson with other members of the group observing the experiences of students. This is the defining activity of the PL experience and makes it unique when compared to similar action research strategies, resulting in an authentic, holistic experience. The research lesson, in particular, is conceptualized as a way of exploring new educational approaches, conflicting ideas

of learning and teaching, and broader educational goals, such as a district vision (Lewis & Tsuchida, 1998). After the research lesson, the group reflects on the lesson to determine key takeaways. Finally and optionally, the group can revise the research lesson and enact that version with a new group of students, repeating this cycle as much as desired. This approach aligns well with best practices for PL in that it is embedded in the school or classroom, research-oriented, collaborative, active, acknowledges and utilizes teachers' interests and lived experiences, and cultivates their professional agency (Hart et al., 2011; Triwaranyu, 2007; Vermunt et al., 2019). Lesson study can also be adapted and take different forms depending on teachers' needs and interests, as well as other contextual factors (Hart et al., 2011; Vermunt et al., 2019).

Varied forms, or models, of lesson study can include participants in the same or different school contexts. The PL program can take place within a single school (school-based model), across multiple schools in a district (cross-school model), or even across school districts, usually with multiple, collaborating lesson study groups (cross-district model) (Triwaranyu, 2007). Other conceptualizations of lesson study models focus less on the individuals involved and more on the process itself. For example, Dudley (2015) created a model that builds on the basic steps of a lesson study plan.

Dudley's (2015) model is characterized by three lesson study cycles, in which the research lesson is revised twice and culminates in a final, improved lesson. In this model, the lesson study group is usually three or four teachers who identify a small number of case students for observation during the research lesson. After each research lesson, the selected case students are interviewed to learn more about their experiences in the lesson. Finally, after all three cycles,

the group's key findings are disseminated to a broader audience, such as other stakeholders in the school system.

It is helpful to consider various models to identify the one that might be a best fit for a particular context and situation; however, no matter what lesson study model is used, adjustments will likely occur throughout implementation to match the dynamic realities of the context and needs of participating teachers (Triwaranyu, 2007). For example, in a qualitative study focused on how lesson study plans change through implementation, Triwaranyu (2007) identified a number of emerging models. In this study, the author observed 21 elementary school teachers across five lesson study groups in Bangkok. Among the four groups that were school-based, only one group maintained a truly collaborative structure, in which all participants contributed to the collective sensemaking process of the group and helped develop and reflect on the research lesson. Another group took on a leader-follower model, in which two members of the lesson study group took on leadership roles in developing and implementing the research lesson, with some other group members developing their own research lessons that were applicable to their classroom settings. A third group developed a supportive group model, in which one teacher developed the research lesson and received assistance from the other members in the form of preparing materials and observing the lesson to provide feedback. The fourth school-based group formed an individual network model, in which each member developed their own research lesson based around the group theme of creative thinking. For participants involved in the lone cross-school group, participants in each school essentially formed their own groups, creating a contingency-based model in which subgroups were largely autonomous but shared ideas and insights at points throughout the lesson study process. Although lesson study plans

tend to change over time through the implementation process, the key design elements appear to have significant learning benefits for teachers, as indicated in the work of Vermunt et al. (2019).

In this study, Vermunt et al. (2019) explored the quality of teacher learning processes in lesson study using both longitudinal and cross-sectional data to determine if teacher learning could improve through participation in lesson study. The authors identified three learning patterns that teachers enacted, often in unique combinations and proportions: (a) meaning-oriented patterns that help teachers develop new theories of professional practice through the integration of knowledge; (b) application-oriented patterns that help teachers consider how to apply their learning in their classrooms, often within their existing theories of practice; and (c) problematic patterns, in which teachers identify obstacles to adopting the innovative practices, systems, etc.

Over the course of one year, the researchers administered surveys three times to identify changes in teacher learning patterns. Through participating in lesson study, teachers increased their meaning-oriented learning patterns and decreased problematic learning patterns, with a positive but non-significant effect on application-oriented learning patterns. The authors attribute this non-significant change to the fact that application-oriented learning patterns were already high at the start of the study. These encouraging results led the authors to note that lesson study might be particularly helpful for teachers who have previously struggled to utilize innovative approaches.

Despite the promises of lesson study, there are some challenges to implementation that must be addressed during planning in order to prevent or at least mitigate potential barriers. Hart et al. (2011) and Triwaranyu (2007) noted that, as a learner-centered approach to professional

learning, participating teachers must be engaged and inquisitive in order for the lesson study to be sustained and for it to have its intended effects. Hart et al. (2011) also highlight four other challenges to implementation that must be mitigated. First, there are significant costs associated with this form of PL since it often requires hiring substitute teachers or making other arrangements for coverage while participating teachers are out of their classrooms. Second, there is a significant time commitment required by participating teachers in order to maximize the positive impact of the lesson study experience. This can be a challenge since PL experiences are still often viewed as one-off events, which could set teachers' expectations about the time they need to devote to any PL program. Third, there needs to be continued dedication to focusing on the experiences of students during the research lesson. Collecting observational data is a skill, and teachers who have not done it previously may lose focus or be otherwise ill-equipped to collect meaningful observational data pertaining to student experiences. Finally, there is the potential for participating teachers to not have the requisite background knowledge required to participate effectively in the lesson study group.

Triwaranyu (2007) proposed strategies for overcoming implementation challenges that occur before and during implementation. Prior to implementation, they recommend (a) explaining to teachers the benefits of lesson study for both them and their students, (b) helping potential participants understand the value their participation will have for the school system as a whole, (c) letting participants select the theme for the lesson study group, and (d) helping teachers connect their existing practices and knowledge to those they will be developing through the lesson study. During implementation, they suggested strategies such as (a) pairing more and less experienced teachers in groups to accelerate the learning of those less experienced teachers;

(b) making sure the group reflects on key takeaways from their collaborative discussions, such as the second phase of the study by Girvan et al. (2016); and (c) including a sub-step between selecting a theme and planning a research lesson in which participants develop shared understandings of key terms and concepts. If lesson study is implemented in a school or district to build learner-centered innovations, this last strategy, adding a sub-step to build shared understanding, would likely be important for participants due to the challenges of creating a shared understanding of LCE.

Improvement Science

Improvement science is a systematic, design-oriented approach to enacting change. It is often enacted through iterative implementation, reflection, and revision in the form of plan-do-study-act (PDSA) cycles (Bryk et al., 2015). While this is a newer approach in the field of education, its efficacy in fields such as the health sciences indicates its utility for catalyzing change.

Improvement science is, by definition, embedded in participants' professional context, and it is often a collaborative practice. In one improvement science comparative case study, participants were members of their district's innovation design team, tasked with using PDSA cycles to create, implement, and scale an innovation (Tichnor-Wagner et al., 2017). Participants in this study were able to implement and iterate on a number of innovations, but there were also challenges that should be considered in future work. For example, most participants identified the benefits of PDSA cycles, but there were mixed feelings about the value of actually implementing these cycles when considering the time and responsibilities involved. It seems possible this perception could be mitigated by creating more time for participating teachers to

focus on improvement science work. Some participants approached the experience with a belief that they were already innovating and PDSA cycles were superfluous, which appeared to limit the benefits of this approach for them. Relatedly, evidence in this study suggests participants pre-maturely connected PDSA cycles to prior innovation experiences, leading to a topical understanding of PDSA cycles that lacked the nuance that made this approach unique and effective. If these sorts of challenges can be addressed, however, improvement science can be an effective approach to structuring PL and helping teachers implement educational innovations (Bryk et al., 2015).

Preliminary Intervention Proposal

Starting with a theoretical framework built upon sociocultural learning theory applied to PL (Raphael et al., 2014; Vygotsky, 1978) and self-efficacy theory (Bandura, 1986), the primary question guiding development of my own intervention study was, How can a socially-situated professional learning program be designed to maximize potential for increasing teacher self-efficacy to support teacher operationalization of learner-centered innovations?

The studies examined in the review of the literature provided evidence that helped answer that question. In combination with key contextual factors of the district (e.g., teacher needs identified in the needs assessment study), I developed an intervention plan based on a theory of treatment (ToT) (Figure 3.2) to effectively support implementation of learner-centered pedagogy and help the district adopt the kind of learning model it first envisioned over five years ago.

Theory of Treatment

The ToT was developed as a bridge between the theoretical framework (Figure 3.1) and the specific activities I envisioned for the PL experience based on the review of the literature and

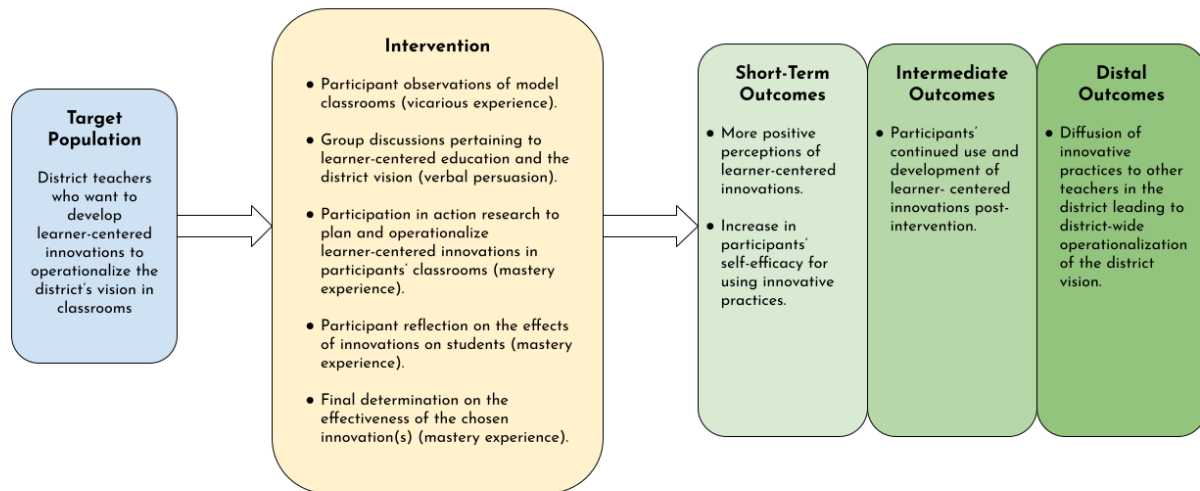
the needs of district teachers. The ToT was used to visualize how this intervention could have a lasting impact on participating teachers and on the broader district context. Specifically, the ToT was designed to reflect sociocultural approaches to PL that would allow participants to (a) have the agency to make pedagogical and curricular decisions for their classrooms; (b) learn in authentic contexts, both through observations and application in their classrooms; and (c) engage in collaborative conversations with their teaching colleagues (Raphael et al., 2014).

This sociocultural approach was also perceived as allowing participants to engage with sources to promote self-efficacy, including vicarious learning experiences, mastery learning experiences, and verbal persuasion (Bandura, 1986). Observations of model learner-centered classrooms were understood as a form of vicarious experience. Group discussions pertaining to learner-centered education and its relevance in our educational context were seen as opportunities for verbal persuasion. Finally, the dual processes of designing and implementing a learner-centered innovation were understood as the culminating mastery experience participants could use in the future as they continued to experiment with learner-centered innovations.

By engaging in these activities that reflect various sources of self-efficacy, participants would have the opportunity to develop increased self-efficacy and more positive perceptions of learner-centered education, leading to their continued development of innovative practices in the future. Ultimately, I believed these operationalization practices would have the potential to diffuse to other teachers and classrooms throughout the district, creating district-wide operationalization of the learner-centered vision. This theory of treatment (Figure 3.2) and underlying theoretical framework (Figure 3.1) informed the initial conceptualization of an intervention plan.

Figure 3.2

Theory of Treatment



Intervention Plan

Based on the theory of treatment, the initial intervention plan was centered around the creation of an action research-oriented professional learning community (Jacobs & Yendol-Hoppey, 2014), in which participating teachers would work together to learn about and apply the district's learning beliefs in their classrooms through the development of learner-centered innovations. Several goals for participants' professional learning shaped the initial structure of the PL experience. By the end of the intervention, the goals were understood to be participants (a) having a clear, shared understanding of the district's vision, (b) being able to evaluate the degree of operationalization of the vision via their own practices and the learning outcomes of their students, (c) conducting action research that would allow them to experiment with learner-centered innovations, and (d) using their learning from the PL experience after conclusion of the intervention. Activities developed to support these goals, and that reflected the

sociocultural theoretical framework, included collaborative discussion of the district vision, observations of model learner-centered classrooms, the planning and implementation of learner-centered innovations, and significant time for individual and group reflection throughout the PL process.

Collaborative discussion would allow participants to learn from each other and from me as a contributor to the discussions. As a teaching colleague of those participating, I believed my pedagogical recommendations and stated belief in the abilities of participants would serve as an effective form of verbal persuasion, since teachers appear to have significant influence over each other regarding engagement in PL experiences (Orrill, 2001). Participant observations would occur in the middle school's learner-centered school-within-a-school (SWS), of which I was one of the lead program developers and facilitators. This SWS utilized a team teaching approach, making it possible for other teachers to experience a learner-centered environment without disrupting the existing routines and practices of the SWS, thus reducing friction for them and for the SWS teaching team. Co-teaching in a learner-centered environment would provide both a collaborative and situated learning experience for participants that would serve as vicarious learning experiences. Lastly, the action-research orientation of this initially planned PL experience would create opportunities for participants to apply what they were learning to their own classrooms. This would involve significant decision-making by participants as they designed and implemented a learner-centered innovation, the key mastery experiences of this intervention. These activities would facilitate immediate and ongoing experimentation with learner-centered innovations because of the emphasis on action research and because they would serve as sources of teacher self-efficacy.

The action research component of this proposed intervention would utilize improvement science (Bryk et al., 2015), because of its simple and effective structure. Specifically, the improvement science process is framed by three questions that pertain to the goal of the process, an action that can be taken to achieve the goal, and measures used to evaluate the success of the action in achieving the goal (Christie et al., 2017). Answering these three questions occurs during the “Plan” phase of the cycle. Next, in the “Do” phase, the plan is carried out and data is collected that will be used to measure the effectiveness of the plan. After that, the data is analyzed in the “Study” phase. Finally, in the “Act” phase, the results are evaluated to determine if the plan should be permanently implemented, revised and reimplemented, or eliminated completely.

Throughout this planned intervention, I perceived that I would rely on the guiding principles of sociocultural learning when making decisions that arose during implementation. For example, I would make decisions to maximize participant agency throughout the process. The goal of doing so would be to promote engagement, provide modeling of a learner-centered experience, and allow participants to connect their learning through this experience to their own life histories. Additionally, this PL experience would have to be sustainable and ongoing (Raphael et al., 2014), lasting at least several months. Though this would require school administrators to create additional time in the workday for participants and facilitators, prior research suggested the importance of extended PL experiences for transforming educational practices (Girvan et al., 2016; Polly & Hannafin, 2011). This potential challenge could be mitigated through early and frequent discussions with school administrators to make sure they

were aware of the organizational capital this approach would require, and through collaboratively adjusting the PL program to fit what would be realistic given resource constraints.

Based on the potential impact of this intervention as illustrated in the ToT and explained in the plan description, this approach was understood to be effective in helping teachers operationalize the district's learner-centered vision. Utilizing the principles of sociocultural learning to cultivate opportunities to engage with the sources of self-efficacy was seen as a way to increase participants' teaching efficacy and lead to ongoing experimentation with learner-centered innovations. The success of this approach was seen as a way to bolster the value of socioculturally-framed PL for teachers, especially PL experiences that allow teachers to observe different classroom models and then use these experiences to help them shape their own classroom routines and practices.

Chapter 4

Intervention Methodology

A review of the intervention literature suggested the effectiveness of a situated, collaborative professional learning (PL) experience with ongoing peer support. This chapter shows how that initial conceptualization was translated into the final intervention study. This includes the purpose, research design, and methods most effective given the needs of teachers in the district and the conclusions drawn from the literature review and resulting theory of treatment.

The intervention study was guided by four goals. The first goal was to contribute to the academic scholarship regarding teachers' professional learning. The second goal was to advance approaches to the operationalization of learner-centered education. The third goal was to help teachers in the district transform their thinking about learner-centered education and their roles as teachers in learner-centered contexts. The fourth goal was to help teachers bring the district's learner-centered vision to life in their classrooms.

This study was framed with a number of research questions guiding both process and outcome evaluation. Process evaluation questions allow researchers to evaluate implementation fidelity (Dusenbury, 2003), while outcome evaluation questions allow researchers to determine the effectiveness of the intervention in helping achieve desired outcomes for participants.

Research questions tied to process evaluation included:

- RQ1: Are adequate resources available and being used to support ongoing intervention implementation and, if not, which resources are limited?
- RQ2: To what extent are intervention activities being adhered to by participants?

- RQ3: To what extent do participants express satisfaction or dissatisfaction with the program and perceive benefits to their professional growth?

Research questions tied to outcome evaluation included:

- RQ4: To what extent does action research embedded in a professional learning community increase teacher self-efficacy?
- RQ5: How does action research embedded in a professional learning community change teachers' perceptions of learner-centered education and its operationalization in their classrooms?

Research Design

This study utilized a quasi-experimental convergent parallel mixed methods pretest-posttest research design (Creswell & Plano Clark, 2017; Shadish et al., 2002). This design provides opportunities for researchers to compare data strands to see where results from each strand converge and diverge. Mixed methods approaches can also reduce or neutralize the limitations of solely qualitative or quantitative methodologies (Creswell et al., 2003). They are particularly useful for conducting program evaluations, in part because mixed methods designs require a pragmatic stance in which the researcher utilizes multiple data types to answer research questions (Creswell & Plano Clark, 2017; Johnson & Onwuegbuzie, 2004). In the case of this intervention study, I was able to see how quantitative and qualitative data strands supported or complicated answers to questions regarding teacher self-efficacy and perceptions of learner-centered education.

This research design did incur some challenges in this study that must be addressed. Although the comparison of multiple data strands can be illuminating, it also poses a challenge to

researchers while interpreting the results (Creswell & Plano Clark, 2017). For example, the simultaneous collection of qualitative and quantitative data, though efficient, can be more complex and challenging than collecting data for other kinds of mixed methods studies, such as explanatory sequential designs (Creswell & Plano Clark, 2017). The primary threat to validity in this study was selection bias (Rossi et al., 2019; Shadish et al., 2002), because participation was voluntary and participants were likely more interested in innovative teaching practices than the general population of teachers in the district. Although selection bias was a challenge to generalizability, findings from this intervention study may still be transferable to other early adopters of educational innovations in this district and similar contexts. This study also serves as a roadmap for the diffusion of educational innovations beginning with early adopters (Rogers, 2003).

By reviewing the strengths and limitations of this quasi-experimental, convergent mixed-methods design, I determined it to be preferable to other possible designs. First, a quasi-experimental design was determined to be more feasible and ethical than an experimental design, which is often the case in social science research (Henry, 2010; Shadish et al., 2002). Second, a convergent mixed-methods approach to data collection and analysis was selected to provide complementary data strands that would allow for a more nuanced understanding of the outcomes of the intervention (Creswell & Plano Clark, 2017).

There were also contextual considerations that led to the selection of this design. One contextual factor that influenced this design choice was the projected number of participants. This PL experience was based on the formation of an action research-oriented professional learning community (PLC), which requires a smaller number of participants. Based on initial

estimates of the number of participants, which were 2-5 total, I opted for a mixed methods approach that would allow me to utilize complementary qualitative and quantitative data strands and would not require advanced inferential approaches to analyzing the quantitative data, which would require a larger sample size in order to draw valid conclusions about the PD program.

Based on the needs of teachers in the district, I designed a socioculturally-framed professional learning experience that allowed participants to engage with multiple opportunities to increase self-efficacy in the domain of learner-centered education, represented in the logic model below (Figure 4.1). These sources of self-efficacy include verbal persuasion, vicarious experiences, and mastery experiences (Bandura, 1986) and were reflected in the PL activities of collaborative discussions (i.e., verbal persuasion), classroom observations (i.e., vicarious experience), and the development of a learner-centered innovation participants could implement in their own classrooms (i.e., mastery experience). A number of inputs and processes from administration, participating teachers, and facilitating teachers had to be accessed and utilized to ensure implementation fidelity. The administrative team, particularly school principals across the district, had to provide initial approval of the intervention, and ongoing provision of needed resources, such as providing substitutes for teaching coverage for participating teachers' classes. Additionally, the district curriculum director had to provide final approval for participating teachers to count their participation toward their yearly professional learning requirements for the district. Participating teachers had to express initial interest in joining the study and then contributed their time and efforts throughout the process. Facilitating teachers, including me, provided information about the study, ongoing support for participating teachers, and ongoing communication with key stakeholders (e.g., administrators and school board members).

By participating in this PL experience, I predicted participants would have more positive perceptions of their abilities as teachers, learner-centered education, and their ability to operationalize learner-centered education in their classrooms, as innovative classroom practices and teacher self-efficacy appear to have a positive, reciprocal relationship (Choi et al., 2019; Hsiao et al., 2011). After the intervention was completed, I conceived this increase in teacher self-efficacy as leading to participant continuation of the innovation development cycle used in the intervention. Over a longer time frame, beyond the scope of the intervention, these innovations and the innovation development cycle should diffuse across the school through participants' social ties (Rogers, 2003; Siciliano et al., 2017), helping all teachers operationalize the district vision. The intervention logic model (Figure 4.1) was developed to highlight some of the key assumptions from the intervention design as well as some of the external factors that were perceived as potentially influencing the results of the intervention.

Figure 4.1

Intervention Logic Model

CONTEXT		
Operationalization of learner-centered educational approaches has been limited in schools across the country, including those in the district. Needs assessment data revealed teachers need guidance, time, opportunities to collaborate, and first-hand experiences in learner-centered classrooms. This intervention is designed to address those needs and its success will be evaluated through analysis of data pertaining to participants' teacher self-efficacy as well as their perceptions of learner-centered education and their abilities to operationalize in their classrooms.		
PROCESS		
Resources	Activities	Outputs
<ul style="list-style-type: none"> • 1 primary facilitator for professional learning • 3 teachers operating the school's learner-centered pilot program (one of whom is the primary facilitator of the PL) • 2-5 teachers in the district who seek to increase their own operationalization efforts. • Ongoing administrative support to ensure adequate time for professional learning. 	4 whole-day PL sessions involving: <ul style="list-style-type: none"> • Participant observations of model classrooms. • Group discussions pertaining to learner-centered education, the district vision, and improvement science. • Participant utilization of PDSA cycles to plan and operationalize learner-centered innovations. • Completion of data collection. 	<ul style="list-style-type: none"> • Quantitative data regarding participants' teacher self-efficacy. • Qualitative data regarding participants' perceptions of learner-centered education and their abilities to operationalize it in their classrooms. • Participant learning artifacts reflecting the planning, implementation, and analysis of their innovative practice.
OUTCOMES		
Short Term	Intermediate	Distal
<ul style="list-style-type: none"> • More positive perceptions of learner-centered innovations. • Increase in participants' self-efficacy for using innovative practices. 	<ul style="list-style-type: none"> • Participants' continued use and development of learner-centered innovations post-intervention. 	<ul style="list-style-type: none"> • Diffusion of innovative practices to other teachers in the district leading to district-wide operationalization of the district vision
ASSUMPTIONS: Teachers need additional support to operationalize the district vision; teachers are motivated to volunteer and will remain engaged over the course of the treatment; administrators will maintain support for the treatment.		
POTENTIAL EXTERNAL INFLUENCES: Competing interventions (e.g., other PL initiatives); organic teacher growth/change; social influence of non-participating teachers on participating teachers.		

Methods

This section includes participant characteristics, measures and instrumentation, and procedural details. Methods for this intervention were selected based on a variety of factors, particularly the results of the needs assessment and best practices of PL identified in the review of intervention literature. As part of the description of procedures, this section provides a detailed explanation of the intervention (i.e., the PL experience) as well as the chosen approach to data collection and analysis.

Participant Selection

The district teachers, some of whom comprised the sample for this intervention, shared some significant characteristics, while other characteristics differentiated them from each other. First, all potential participants were in-service public school teachers of grades K-12. However, the population had diverse levels of teaching experience and various certification areas, ranging from electives such as music and art to special education and core classes including math and language arts. All potential participants were college educated, with many also having graduate-level experience. There was a wide age-range of teachers in the district, including teachers who had just recently graduated from college and those who were nearing retirement. Additionally, the overwhelming majority of the teaching population identified as caucasian.

Convenience sampling (Patton, 1990) of teachers within the district was chosen for this study, because random or purposive sampling would not have allowed teachers to exercise the agency of choice essential in socioculturally-situated PL experiences (Raphael et al., 2014), in addition to the previously noted ethical concerns (Henry, 2010; Shadish et al., 2002). Sampling the available population of K-12 school teachers in the district did reduce the potential for

generalizability. However, I believe the study implications offer some degree of transferability (Krefting, 1991), or at least relevance, to the broader theoretical population (Pettus-Davis et al., 2011) of all K-12 public school teachers, at least those who are inclined to experiment with innovative practices. Based on conversations with various stakeholders and my understanding of the most effective size for a PLC, the goal sample size is 2-5 participants.

The selection process began with sending a group email to district teachers notifying them of the study, emphasizing that it was optional and that there would be no punishment or other adverse response if they chose not to participate. This email also included the informed consent form, allowing teachers to review all study details. Interested teachers had to take the following steps to sign up: (a) read the entire informed consent form, (b) email the facilitator to confirm their interest and set up a time to discuss the study to ensure they understood what participation required of them, and (c) sign a physical or digital copy of the informed consent form if they were still interested in participating after that discussion. Three teachers expressed interest in participating in the study. However, one of them dropped out of the study prior to it starting due to the pressure of their other professional responsibilities. Ultimately, two teachers, both located at the middle school, participated in the study.

Measures and Instrumentation

Study measures and instrumentation were selected to align with the overall research design. Data was collected for the purposes of both process and outcome evaluation. Process evaluation variables included resource utilization, adherence, and participant responsiveness. Resource availability was understood in this study as the availability and appropriate use of resources needed to conduct the PL experience as planned (Baranowski & Stables, 2000).

Adherence in this study referred to the extent to which participants satisfactorily completed all activities comprising the PL experience. These activities included those conducted during and between each PL session (Dusenbury et al., 2003). Lastly, participant responsiveness for this study referred to participant satisfaction and engagement with the PL experience (Dusenbury et al., 2003).

Resource availability was monitored over the course of the intervention period using a resource availability checklist (see Appendix D), which was used to note if and when needed resources were or were not available or utilized as planned. Adherence and participant responsiveness was measured via mixed model (Teddle & Tashakkori, 2003) survey items developed for this purpose (see Appendix E). For example, the item used to measure participant required participants to respond on a Likert-style scale to the statement, “I have completed ALL required activities both during and between sessions to the best of my ability.” This quantitative item was supplemented with an open-ended, qualitative item asking participants to elaborate on their response on the Likert-style scale. Data pertaining to these variables helped me determine the degree to which this intervention study was implemented as planned and, in cases where implementation fidelity suffered, identify how that may have affected the results.

Several measures were used for outcome evaluation, including how the PL experience affected participants’ thoughts and feelings about learner-centered education in general and about the work involved in creating a learner-centered classroom. Variables included teacher self-efficacy and participant sensemaking. The definition of self-efficacy used in this study is an individual’s beliefs about their domain-specific abilities to complete a desired task (Bandura, 1986). Therefore, teacher self-efficacy included teachers’ beliefs in their ability to complete tasks

such as managing a classroom or effectively motivating students (Tschannen-Moran & Chan, 2014). Participant sensemaking was defined in this study as teachers' cognitive and affective interpretations and responses to learner-centered education, the district's vision, and their roles in enacting that vision in their classrooms (Schmidt & Datnow, 2005; Siciliano et al., 2017; Weick et al., 2005).

All outcome evaluation variables were measured via a mixed model (Teddle & Tashakkori, 2003) questionnaire (see Appendix F) and semi-structured focus group discussion that occurred at the conclusion of the intervention. Teacher self-efficacy was measured with open-ended items developed for this purpose as well as items from the short form of the Teacher Sense of Efficacy Scale (TSES) developed by Tschannen-Moran and Woolfolk Hoy (2001). This scale was chosen because of the clearly delineated and rigorous development and validation process undertaken by the researchers. Their development process involved the reduction of items from an initial list of 52, using strategies including principal-axis factoring with varimax rotation, until the final scale was reduced to 24 items in its long form and 12 items in its short form. The Likert-style scale used for these items has nine selection options, ranging from "None at All" to "A Great Deal." Sample items from the short form include "How much can you do to control disruptive behavior in the classroom?" and "How much can you do to motivate students who show low interest in school work?" The open-ended item developed for this study that related to teacher self-efficacy for innovative practices was "How confident are you in your ability to use learner-centered practices in your classroom?"

The semi-structured focus group discussion was used to gather rich qualitative data on both outcome indicators, teacher self-efficacy and sensemaking. Guiding questions for this

discussion (see Appendix G) included “How, if at all, did participation in this professional learning change your understanding of learner-centered education in general?” and “How, if at all, did participation in this professional learning experience change your approach to experimenting with learner-centered innovations in your classroom?” Using these measures supported identification of the effects of this PL experience on participants with regards to the desired outcomes.

Procedure

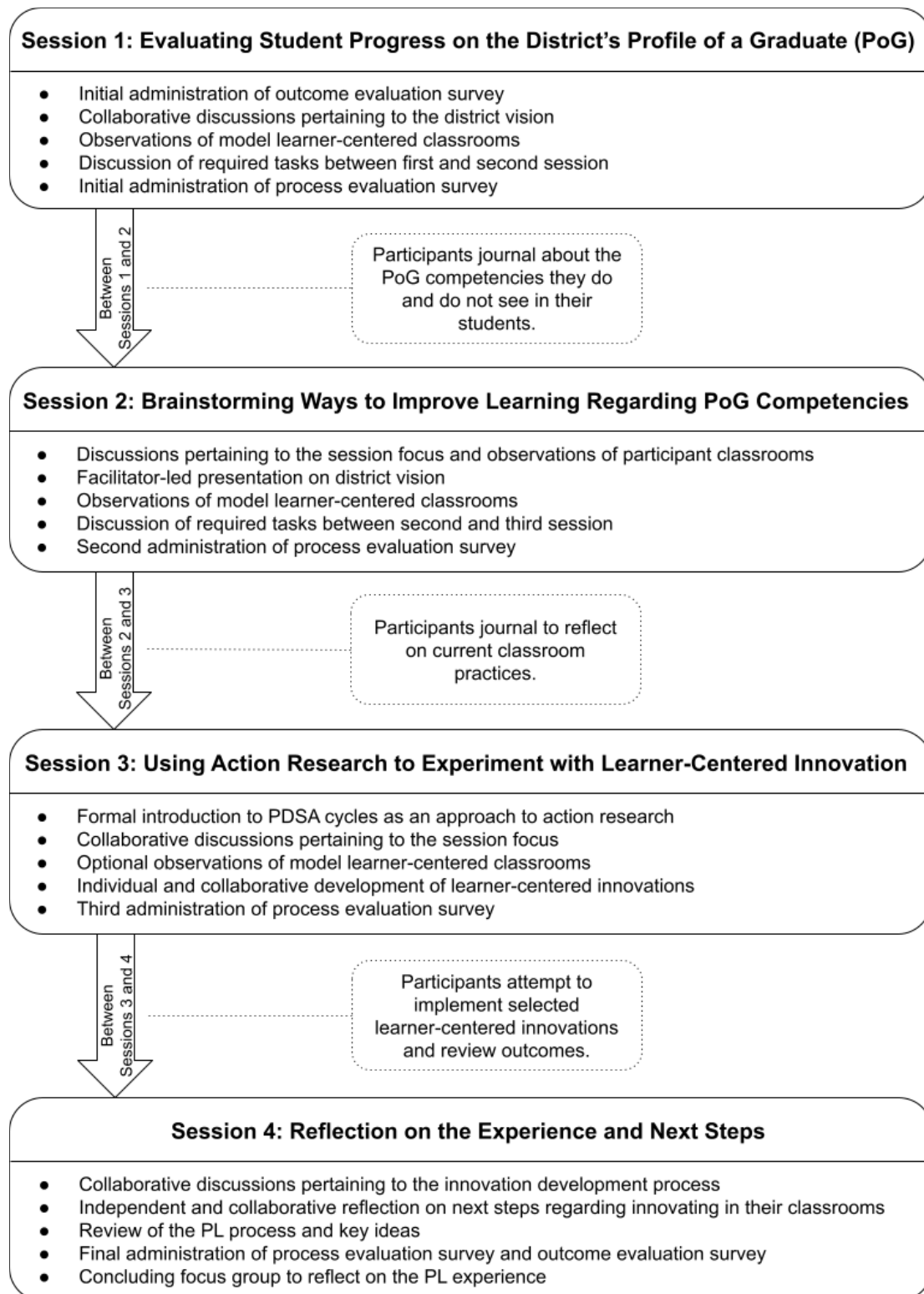
The following sections include specific steps and tasks related to the intervention (i.e., PL experience), data collection, and data evaluation. These approaches were selected to align with the overall research design in support of answering the process- and outcome-related research questions.

Intervention Procedure

The intervention design was based on the formation of a PLC with a focus on participant observation of model classrooms, collaborative discussion, and individual development of learner-centered innovations, supporting PL best practices of collaboration, active learning, and reflection (Avalos, 2011; Darling-Hammond et al., 2017; Desimone & Garet, 2015). The intervention was divided into four whole day sessions, each with a unique guiding focus connecting each session to the next (Figure 4.2).

Figure 4.2

Overview of Professional Learning Sessions



Session One. The focus of Session One (Figure 4.3) was evaluating student progress on the district's profile of a graduate (PoG). This session began with pretest administration of the questionnaire used for outcome evaluation. Following this initial administration, I facilitated an introductory discussion regarding goals for the session and consideration of the district vision, its implications for student growth and behavior, and recommendations for collecting evidence of these abilities and behaviors. In addition to these topics, participants were encouraged to ask clarifying questions to help them situate their thinking with regards to the intervention.

This conversation was followed by participant observations of the middle school's learner-centered school-within-a-school (SWS). The goal of these observations was two-fold. First, these observations served as an opportunity for participants to see learner-centered education operationalized in classrooms, a request noted by participants in the needs assessment. As such, these observations were an opportunity to engage in the vicarious experience of operationalization of learner-centered education, which was conceived as helping increase participant self-efficacy (Bandura, 1986). Second, these observations allowed participants to reflect on student demonstrations of PoG competencies in the model classrooms. Additionally, this reflection was an opportunity to evaluate classroom practices. This evaluative process also allowed participants to determine the PoG competencies that were most reflected in student actions in the model classrooms and the ones that were least reflected.

These participant observations were followed by collaborative discussion regarding questions and observations about practices in the model classroom and tying the observations to the first discussion of the day. In this conversation, participants reflected on observations made of the model classroom, including areas in which the classroom experience could be improved.

This final discussion concluded with facilitator-led goal-setting to prepare for the next session. Participants were then asked to apply the same evaluative skills they used during observations of the SWS to their own classrooms, identifying the classroom practices that were supporting or hindering student progress towards the PoG goals. Specifically, participants identified and reflected on practices in their classrooms to determine what opportunities were present and absent for students to develop the PoG competencies. Participant notes from their observations were brought to the next session. Lastly, participants completed the process evaluation questionnaire (see Appendix E).

Figure 4.3*Session One Outline*

SESSION ONE		
Goal: Participants will develop knowledge and skills needed to evaluate student progress on the district's profile of a graduate (PoG).		
Procedure	Time	Notes
Participant Arrival	7:45-8:00am (15 minutes)	Participants prepare for the session by reviewing the agenda given to them and ensuring they have necessary materials (e.g. laptop).
Administration of Outcome Eval Survey	8:00-8:30am (30 minutes)	See Appendix F for questionnaire.
Introductory Discussion	8:30-9:30am (1 hour)	Review of goals for the session; discussion of participant perceptions of the district PoG; discussion of how PoG is reflected in student growth and actions; recommendations for identifying and collecting data related to this growth.
Observations of Model Learner-Centered Classrooms	9:30-11:00am (1.5 hours)	Focus of these observations will be acclimating to the practices of the model classrooms and identifying ways in which learners demonstrate PoG competencies. Participants will write down field notes.
Lunch	11:00-12:30pm (1.5 hours)	Participants have time to leave the school grounds for lunch and review their field notes.
Group Discussion	12:30-1:30pm (1 hour)	Discussion will include general questions and observations of model classrooms; sharing of participant field notes about student demonstrations of PoG competencies; identification of areas of need in the model classrooms; reflection on how observation clarified understandings of the PoG competencies.
Review of Session and Work to be Completed Between Sessions	1:30-1:45pm (15 minutes)	Participants and facilitator will all have opportunities to share their reflections on this session with the group; the facilitator will explain the task participants will complete between sessions: taking field notes in their own classrooms to identify which PoG competencies are and are not reflected in student actions in their classrooms.
Administration of Process Eval Survey	1:45-2:00pm (15 minutes)	See Appendix E for questionnaire.
Participant Departure	2:00-2:15pm (15 minutes)	This time will also serve as an opportunity for participants to ask individual questions, reflect on the session, and get a head start on the task they need to complete between this session and the next.

Session Two. The focus of Session Two (Figure 4.4) was brainstorming ways in which teachers could utilize the district learning beliefs (LBs) to improve student growth regarding PoG competencies. A bridging activity between this session, the previous session, and the work completed between sessions was a collaborative discussion of each participant's reflections on their own classroom practices. In reflecting on their observations, participants were able to consider areas of need in their own classrooms. As this conversation continued, participants were guided to identify how learner-centered classrooms differ from traditional classrooms in ways such as technology use and the roles of teachers and students.

After this discussion, I led a short, interactive presentation about the learning beliefs comprising the district vision and how their use could help district teachers support student growth regarding the PoG competencies. This short presentation was followed by a conversation regarding participants' past experiences thinking about and utilizing the district's learning beliefs, as well as what the learning beliefs could look like in practice more generally. As in Session One, these conversations were followed by participant observations of the model classrooms to see how the learning beliefs were operationalized in the SWS, including ways in which the learning beliefs could be more fully operationalized.

Following these observations, there was a collaborative discussion to debrief on observations made in the model classrooms. This conversation served as a bridge across the PLC's discussion of the practices identified in their classrooms related to the district vision, operationalization of the district learning beliefs in general, and some of the innovative practices they were interested in developing and using. Following this conversation, we held a goal-setting discussion about the task participants were asked to complete between this and the next session.

This task was a journaling activity in which participants reflected on the ways and extent to which they were operationalizing the district vision in their classrooms. This session ended with a second administration of the process evaluation survey.

Figure 4.4*Session Two Outline*

SESSION TWO		
Goal: Participants will develop knowledge and skills needed to determine how the district learning beliefs (LBs) can be operationalized in classrooms to increase student growth regarding PoG competencies.		
Procedure	Time	Notes
Participant Arrival	7:45-8:00am (15 minutes)	Participants prepare for the session by reviewing the agenda given to them and ensuring they have necessary materials (e.g. laptop).
Group Discussion	8:00-8:30am (30 minutes)	Focus on participants' findings from their own needs assessments regarding student activity related to PoG competencies.
Facilitator Presentation and Group Brainstorm	8:30-9:30am (1 hour)	Brief overview of the learning beliefs and how they relate to the PoG competencies, followed by group discussion regarding past experiences using the LBs and brainstorming other ways in which each learning belief can be operationalized in classrooms.
Observations of Model Learner-Centered Classrooms	9:30-11:00am (1.5 hours)	Focus of these observations will be identifying ways in which the learning beliefs are operationalized in the model classrooms. Participants will write down field notes.
Lunch	11:00-12:30pm (1.5 hours)	Participants have time to leave the school grounds for lunch and review their field notes.
Group Discussion	12:30-1:30pm (1 hour)	Discussion will include general questions and observations of model classrooms; sharing of participant field notes about how the learning beliefs are being operationalized in model classrooms, and ways in which they could be operationalized in the future.
Review of Session and Work to be Completed Between Sessions	1:30-1:45pm (15 minutes)	Participants and facilitator will all have opportunities to share their reflections on this session with the group; the facilitator will explain the task participants will complete between sessions: journaling about what practices in participants' own classrooms reflect the learning beliefs..
Administration of Process Eval Survey	1:45-2:00pm (15 minutes)	See Appendix E for questionnaire.
Participant Departure	1:45-2:00pm (15 minutes)	This time will also serve as an opportunity for participants to ask individual questions, reflect on the session, and get a head start on the task they need to complete between this session and the next.

Session Three. The focus of Session Three (Figure 4.5) was using action research to develop and experiment with learner-centered innovations. In this session, participants were formally introduced to improvement science and the PDSA cycle (Christie et al., 2017), using the data they collected in their needs assessments to initiate the planning phase of the PDSA cycle. First, there was a collaborative discussion regarding participants' written reflections of their current practices to share their key conclusions drawn from the exercise. This discussion was followed by a facilitator-led presentation introducing PDSA cycles as an approach to action research, including examples of how the cycle had been used informally to develop SWS practices such as a competency-based assessment system and daily student-selected class schedules.

After a question and answer session at the conclusion of the short presentation, participants were given significant time to conduct the planning phase of their own PDSA cycle, utilizing each other and me to help them brainstorm. This planning phase resulted in three decisions, including (a) a goal related to improving student growth with regards to the PoG, (b) a change the participant could make related to the learning beliefs to achieve this goal, and (c) the kinds of behaviors and discussion the teacher might observe to determine the impact of the change. During this extended planning time, participants also had the option to observe the SWS if they wanted to identify concrete examples of innovations they might apply in their own classrooms.

This session ended with a group debriefing in which participants shared their plans and reflected on the planning process. The last part of this debriefing conversation involved a facilitator-led discussion of the task participants would complete between this and the next

session, which would be the implementation of their plans in their classrooms. In addition to the implementation of their operationalization plans, participants would use some time between sessions to reflect on the implementation process. Like Session Two, this session concluded with the administration of the process evaluation survey.

Figure 4.5*Session Three Outline*

SESSION THREE		
Goal: Participants will develop knowledge and skills needed to design a learner-centered innovation to be used in their classrooms based on the results of their needs assessments.		
Procedure	Time	Notes
Participant Arrival	7:45-8:00am (15 minutes)	Participants prepare for the session by reviewing the agenda given to them and ensuring they have necessary materials (e.g. laptop).
Group Discussion	8:00-8:30am (30 minutes)	Participants will share their key conclusions from the journaling activity about their current practices and which are aligned to the LBs.
Facilitator Presentation w/ Q&A	8:30-9:00am (1 hour)	Facilitator-led presentation about PDSA cycles with examples about how the SWS has been designed with a similar iterative process; participants will be encouraged to ask questions throughout.
Independent Planning Time	9:00-11:00am (2 hours)	Participants will use this time to do the planning phase of their own PDSA cycles, collaborating with other PLC members as desired. Additionally, participants can choose to observe the model classrooms during some of this time.
Lunch	11:00-12:30pm (1.5 hours)	Participants have time to leave the school grounds for lunch and review their field notes.
Independent Planning Time	12:30-1:00pm	Continuation of independent planning that started before lunch.
Group Discussion	1:00-1:30pm 30 minutes)	Participants will share their plans and have opportunities to receive feedback from other PLC members.
Review of Session and Work to be Completed Between Sessions	1:30-1:45pm (15 minutes)	Participants and facilitator will all have opportunities to share their reflections on this session with the group; the facilitator will explain the task participants will complete between sessions: implementing their plan (i.e., completing the “Do” portion of the PDSA cycle) and reflecting on how implementation impacted students.
Administration of Process Eval Survey	1:45-2:00pm (15 minutes)	See Appendix E for questionnaire.
Participant Departure	1:45-2:00pm (15 minutes)	This time will also serve as an opportunity for participants to ask individual questions, reflect on the session, and get a head start on the task they need to complete between this session and the next.

Session Four. The focus of Session Four (Figure 4.6) was to reflect on participant experiences and determine next steps following the conclusion of the PL experience. This reflection focused on the entire PL experience, including participant learning regarding LCE as well as the planning and implementation of their own learner-centered innovations. The determination of next steps was designed to serve as an opportunity for participants to consider how they could apply what they had learned in the PL experience to their daily work after the conclusion of the intervention. Due to challenges explained in detail in Chapter Five, participants were unable to implement their innovations, leading this session to diverge from what is outlined in Figure 4.6. Changes made to the activities of Session Four are noted in the following paragraphs.

The first activity in this session was planned as a collaborative discussion about the experience of experimenting with their chosen learner-centered innovation, including what participants might have noticed regarding student activity and how participants felt taking on new roles in a learner-centered classroom. However, due to participants' inability to implement their developed innovations, this opening discussion focused on conversations around the challenges that arose and ultimately prevented implementation. Instead of using the next block of time to complete the "Study" and "Act" phases of the PDSA cycle, participants used this time to discuss, based on prior observations of their own classrooms and predict the aspects of the learner-centered teaching strategies they developed with which students would need the most support. This discussion served as the basis for a written reflection about these potential student needs and strategies participants thought would best support students when first introduced to these learner-centered approaches. After this individual writing and reflection time, the group

reconvened to discuss their individual reflections and their plans for revising their learner-centered innovations to address student needs during early implementation, when students would be adjusting to these new approaches.

At the conclusion of this conversation, I led a review of the entire PL experience as well as key ideas and activities participants could use as they continued to experiment with learner-centered innovations. Then, participants completed two questionnaires, the first being the process evaluation questionnaire they completed each session and the second being the posttest administration of the outcome evaluation questionnaire originally administered in Session One. Finally, participants took part in the semi-structured focus group.

Figure 4.6*Session Four Outline*

SESSION FOUR		
Goal: Participants will reflect on their experiences in the PL sessions, evaluate the effectiveness of their learner-centered innovation, and determine their plan for using what they have learned after the conclusion of the intervention.		
Procedure	Time	Notes
Participant Arrival	7:45-8:00am (15 minutes)	Participants prepare for the session by reviewing the agenda given to them and ensuring they have necessary materials (e.g. laptop).
Group Discussion	8:00-9:00am (1 hour)	Participants will share their experiences implementing their chosen learner-centered innovations. This will include discussion about how students responded to the practice.
Independent Reflection Time	9:00-10:00am (1 hour)	Participants will use this time to review their data from implementation to determine the effectiveness of the innovation; they will also complete a written reflection of this evaluation process.
Group Discussion	10:00-11:00am (1 hour)	Participants will share their evaluations of the success of their learner-centered innovation and how they might revise it in the future.
Lunch	11:00-12:30pm (1.5 hours)	Participants have time to leave the school grounds for lunch and review their field notes.
Facilitator Presentation	12:30-12:45pm (15 minutes)	The facilitator will review the progression of the PL sessions as well as some of the key ideas for participants to remember.
Group Discussion	12:45-1:00pm (15 minutes)	Participants will share their perspectives on the PL experience as a whole and some of the key ideas they will take away from the experience.
Administration of Process Eval Survey and Outcome Eval Survey	1:00-1:20pm (20 minutes)	See Appendix E and Appendix F for questionnaires.
Focus Group Discussion	1:20-2:00pm (40 minutes)	Discussion will be recorded and will be centered on the guiding questions (Appendix G).

Data Collection Procedures

Most qualitative and quantitative data for both process and outcome evaluations were collected via mixed model (Teddlie & Tashakkori, 2003) questionnaires. The process evaluation survey was administered at the end of each of the four PL sessions, as initially planned. The outcome evaluation survey was administered at the beginning of the first session and end of the fourth session (i.e., at the beginning and end of the intervention period) in alignment with the proposed pretest-posttest research design. Both surveys were completed online using Google Forms. Participant responses to the pretest were made available to them during completion of the posttest to help them reflect on their growth from the beginning to end of the PL experience. Data regarding resource availability was collected via researcher observation on an ongoing basis. Specifically, I determined both during and between sessions whether or not all necessary resources for the implementation of the PL experience were available as expected, using the resource availability checklist to guide data collection.

Multiple steps were taken to ensure participant identities and other data were protected throughout and after the intervention process. Data from the evaluation questionnaires and focus group were coded with pseudonyms. The digital document connecting participant names to their pseudonyms, the audio recording of the focus group, and the transcription of that focus group were stored in my private, password-protected cloud drive. No identifiable information has been reported in the results section or any other sections of this report.

Data Analysis Procedures

Data analysis for both the quantitative and qualitative strands involved best practices such as familiarizing myself with the data and cleaning it prior to final analysis (Lochmiller & Lester,

2017). Quantitative data analysis focused on descriptive statistics because the sample size of the study limited my ability to determine validity through inferential statistics (Lochmiller & Lester, 2017). As part of this quantitative data analysis, I calculated and evaluated descriptive statistics including mean, median, mode, and standard deviation.

Pretest data from the outcome evaluation questionnaire was evaluated in isolation after Session One to identify the perceptions of participants prior to beginning intervention activities. Results from each of the four administrations of the process evaluation survey were analyzed after each session to determine the extent to which implementation of the PL experience was proceeding as planned. Finally, posttest data of the outcome evaluation questionnaire was evaluated after Session Four and then compared to the pretest data to help draw conclusions about the outcomes of the PL experience for participants.

I analyzed qualitative data using a combination of content analysis and thematic analysis (Miles et al., 2018). Resource availability was evaluated by conducting content analysis of the Resource Availability Checklist. In instances where needed resources were not available, I considered how the lack of that resource did or might have impacted the PL experience.

For qualitative data pertaining to participant adherence, responsiveness, self-efficacy, and perceptions of learner-centered education and its operationalization, I utilized thematic analysis, as defined and described by Miles et al. (2018). This involved a multistep process of cyclical coding resulting in the development of themes. First cycle coding involved the initial application of codes, jottings, and analytic memos to data chunks. These first cycle codes included both descriptive and in vivo words and phrases. The second coding cycle involved the consolidation of my initial code list into a smaller set of pattern codes, which were used as the building blocks

for final themes. Using these pattern codes, as well as relevant analytic memos, I determined what narratives emerged from the data in relation to my research questions. Evaluation of qualitative data from the questionnaires occurred simultaneously with the evaluation periods for quantitative data noted above. The coding process was applied to the transcript resulting from the focus group discussion after the final study session.

The Research Summary Matrix (Figure 4.7) presents the alignment of elements in this study. Columns represent each key element of the research design, including research questions, variables, instrumentation, data collection procedures, and data analysis procedures. Rows are organized to reflect the alignment between each research question and the other elements. For example, RQ1 is written with a focus on the variable of resource availability. This variable was measured with the Resource Availability Checklist (see Appendix D), which was used immediately prior to and following each PL session, as noted in the fourth cell of that row. The final cell of that row shows this data was analyzed via content analysis.

Figure 4.7*Research Summary Matrix*

Research Question	Indicator	Instrument	Frequency	Data Analysis
RQ1: Are adequate resources available and being used to support ongoing intervention implementation and, if not, which resources are limited?	Resource Availability	Resource Availability Checklist	Immediately prior to and following each session	Content Analysis
RQ2: To what extent are intervention activities being adhered to by participants?	Participant Adherence	Process Evaluation Survey	At the end of each PL session	Descriptive statistics; thematic analysis
RQ3: To what extent do participants express satisfaction or dissatisfaction with the program and perceive benefits to their professional growth?	Participant Responsiveness	Process Evaluation Survey	At the end of each PL session	Descriptive statistics; thematic analysis
RQ4: To what extent does action research embedded in a professional learning community increase teacher self-efficacy?	Teacher Self-Efficacy	Outcome Evaluation Survey; Focus Group	Questionnaire at beginning of Session 1 and end of Session 4; focus group at end of Session 4	Descriptive statistics; thematic analysis
RQ5: How does action research embedded in a professional learning community change teachers' perceptions of learner-centered education and its operationalization in their classrooms?	Teacher Sensemaking	Outcome Evaluation Survey; Focus Group	Questionnaire at beginning of Session 1 and end of Session 4; focus group at end of Session 4	Descriptive statistics; thematic analysis

Conclusion

This intervention study was designed to address the problem of practice present in the district and other educational contexts across the country, where operationalization of learner-centered innovations has progressed slowly. Specific design decisions were informed by an identification of factors empirically linked to the problem (Chapter 1), an empirical needs assessment study of teachers in the district (Chapter 2), and a review of approaches to professional learning that effectively support teacher growth (Chapter 3). In addition to helping alleviate this problem in the district, this study was conceptualized as having the potential to illuminate and refine understandings of effective professional learning and the best approaches to support teachers as they operationalize learner-centered education in classrooms. Through the process of developing research questions and aligning the research design to each of them, this study was well-placed to achieve the aforementioned goals. The fifth and final chapter of this dissertation discusses the process of implementing the PL experience and presents an analysis of the data to draw conclusions related to the research questions.

Chapter 5

Results and Discussion

This chapter outlines implementation of the intervention designed to support teachers in the district in operationalizing the district's learner-centered vision in participants' classrooms. The two resulting innovations designed by participants included a semester-long research project to guide students through the steps of investigating a topic, as well as the incorporation of classroom routines and signage to help students develop the habit of persistence. Both of these projects are aligned with the district's learner-centered goals and are briefly described. This chapter also includes findings and results for both process and outcome evaluations, as well as key conclusions, a discussion of the implications and limitations of this study, and recommendations for future research.

Process Evaluation

Implementation of the intervention occurred over a nine week span in April, May, and early June of 2022. As previously noted, one of the three original participants exited the study prior to it starting. The two participants who remained for the entire study were involved in four professional learning sessions framed by improvement science and action research. In these sessions, they discussed and reflected on the operationalization of learner-centered education, as well as developed learner-centered innovations tied to the district vision that they could implement in their classrooms. Time spent in the professional learning sessions totaled approximately 24 hours, not including the time participants used to complete activities between sessions.

Process Evaluation Research Questions

The following research questions guided the data collection and analysis pertaining to process evaluation:

- RQ1: Are adequate resources available and being used to support ongoing intervention implementation and, if not, which resources are limited?
- RQ2: To what extent are intervention activities being adhered to by participants?
- RQ3: To what extent do participants express satisfaction or dissatisfaction with the program and perceive benefits to their professional growth?

These questions reflect various elements of implementation fidelity (Dusenbury, 2003), a conceptualization of process evaluation that focuses on the extent to which the actual process of implementation matched what was planned. The three elements of implementation fidelity reflected in the research questions are resource availability, participant adherence, and participant responsiveness, respectively. As noted in Chapter Four, resource availability refers to the availability and appropriate use of resources needed to conduct the professional learning (PL) experience as planned (Baranowski & Stables, 2000); adherence refers to the extent to which participants satisfactorily complete all activities comprising the PL experience; and participant responsiveness refers to participant satisfaction and engagement with the PL experience (Dusenbury et al., 2003).

Resource Availability Findings

Resource availability findings were used to answer RQ1 and determine if the resources necessary for this intervention were available throughout the implementation process. The resources monitored over the course of the intervention were (a) classroom coverage for each

participant, (b) collaborative meeting space for us as the professional learning community (PLC), (c) individual work space for participants, and (d) instructional materials for each session. These resources were monitored via the Resource Availability Checklist (see Appendix H for the completed checklist), which I used at the beginning and end of each session to make note of the availability of resources needed for each PL session.

Classroom Coverage for Each Participant

Classroom coverage refers to the availability of other teachers or substitute teachers to monitor the participants' classrooms while the participants took part in PL sessions.

Observations and notes from the Resource Availability Checklist indicate classroom coverage was available most of the time it was required. However, due to staffing challenges during the first period of the school day, I shifted the start time for PL sessions two through four from 7:45am to 8:15am. This slight shortening of sessions two through four did not have a material impact on the PL sessions, with only a few minutes lost in each planned PL activity.

Collaborative Meeting Space for the PLC

Collaborative meeting spaces were necessary for the PLC to conduct group activities. These activities included collaborative discussion and development of participants' learner-centered innovations. Findings from the Resource Availability Checklist indicate that collaborative meeting spaces were mostly available throughout the course of the intervention. As explained in the notes section of the checklist, the location of group activities was shifted occasionally to accommodate other school activities.

Individual Work Space for Participants

Individual work spaces were necessary for participants to complete independent PL

activities, such as individual planning and reflection time. The checklist notes indicate that these spaces were mostly available. However, participants had to share a classroom in which to work independently due to space limitations. I, as the facilitator, went elsewhere during independent work time.

Instructional Materials for Each Session

I created digital instructional materials for each PL session aligned with the goals and activities of each session agenda (see Chapter 4). These materials included participant workbooks that aligned with the stated PL activities as well as visuals to support discussion of the district vision. All materials were shared with participants via Google Classroom. As noted in the Resource Availability Checklist, there were no limitations regarding the availability of the necessary instructional materials.

Participant Adherence Results and Findings

Data pertaining to participant adherence, the extent to which participants completed all study activities both during and between PL sessions, was used to answer RQ2. Activities ranged from discussions of the district vision to observations of model classrooms and planning time, with all activities broadly focused on the dual goals of strengthening participants' teaching efficacy and helping them develop a shared understanding of LCE to help participants operationalize LCE in their classrooms.

Participant adherence data was collected via the mixed methods process evaluation questionnaire (see Appendix E) and analyzed for each session as well as longitudinally for each participant. All quantitative data was analyzed using IBM SPSS v28. Participant responses to the item pertaining to adherence are presented longitudinally in Table 5.1 and reflect their

perceptions of the value of the PL experience across the approximately two month span during which it occurred. Descriptive statistics are presented in Table 5.2., which also includes descriptive statistics for participant responsiveness that are discussed in a following section. The quantitative participant adherence item, “I have completed ALL required activities both during and between sessions to the best of my ability,” required participants to respond to a 9 point Likert-style scale, with a 1 representing “Strongly Disagree” and a 9 representing “Strongly Agree.” The data presented in Table 5.1 makes it clear that participants believed very strongly that they adhered to all PL activities up until the final session, during which Participant A scored their adherence as a 7 and Participant B scored their adherence as a 3. As discussed in detail below, this difference may be due to the challenges both participants experienced when implementing their designed innovations in the time between sessions three and four.

The qualitative data clarifies participant thinking regarding adherence to PL activities. In sessions one through three, participants noted complete participation in responding to questionnaires, engaging in collaborative discussion, observing the school-within-a-school (SWS), and developing their own learner-centered innovations. For example, at the end of Session 3, Participant B noted, “Today we were able to plan how we will improve focus on components of the Profile of a Graduate and district Learning Beliefs within our classrooms. We left today’s session with a plan to implement, which was the goal.” This response reflects participant perceptions that, through the first three sessions, participants progressed through the activities as planned. In this case, Participant B felt there was adequate time to consider the district’s learner-centered vision as reflected in the two documents noted above, the Profile of a Graduate (PoG) and Learning Beliefs (LBs). Other activities completed in Sessions One through

Three included creating operational definitions of all 26 terms referenced in the PoG and LBs, observing the SWS over multiple class sessions, and developing learner-centered innovations through a cyclical process of individual planning and PL group feedback. Through this development process, participants planned classroom innovations that included persistence activities added into students' daily routines and a passion project that would allow students to select their own topics of study as well as their own learning demonstrations

Participants completed the study activities noted above, which represent all but one of the planned activities. Time constraints limited participants' abilities to implement their innovations between sessions three and four. This was the PL activity that required the most time to complete between the sessions, making it the most challenging for participants to execute. Participant A noted they “fell short on time.” Participant B elaborated on the factors that inhibited implementation of their learner-centered innovation, including “timing, testing schedules, and end of the year requirements,” with testing schedules referring to the large amount of time, approximately three weeks, the district had to devote to standardized and benchmark testing in the final marking period of the school year. The differing quantitative responses collected in Session 4 pertaining to adherence (i.e., 7 and 3 for Participants A and B, respectively) appear to reflect participants' challenges with limited time despite the wide variation in numerical response. In response to this reality, the Session 4 independent work time and collaborative planning time was changed to give participants more opportunity to plan and refine their learner-centered innovations so they could implement them in the future, after the conclusion of the intervention.

Table 5.1*Participant Adherence Ratings by Session*

Participant	Session 1	Session 2	Session 3	Session 4
Participant A	9	9	9	7
Participant B	9	9	9	3

Table 5.2*Process Evaluation Measures of Central Tendency and Standard Deviations*

Variable	Mean	Median	Mode	SD
Participant Adherence	8.00	8.00	9.00	2.14
Participant Responsiveness	9.00	9.00	9.00	0.00

Participant Responsiveness Results and Findings

RQ3 addresses participant responsiveness as measured by participant engagement and satisfaction data. As with the participant adherence data, participant responsiveness data was collected via the mixed methods process evaluation questionnaire, which included one quantitative item and one open-ended item pertaining to responsiveness. The quantitative data was analyzed longitudinally for each participant as well as cross-sectionally for each session.

Table 5.3 shows the session-by-session responses for each participant to the item, “I believe this professional learning experience is beneficial to my professional growth and I am still interested in participating.” This item incorporated two elements of responsiveness as conceptualized by Dusenbury et al. (2003), namely the perceived value of each session and participants’ desires to participate in future sessions. Quantitative analysis for participant

responsiveness data was brief, given that both participants responded with a 9 (Strongly Agree) in each session. This quantitative data suggests a high degree of participant responsiveness throughout the PL experience.

Qualitative data analysis helped explain the consistently positive responses to this PL experience by participants. Participant A noted that collaborative conversations around the PoG and LBs were “extremely helpful in clarifying my understanding” and the collection of PL activities led them to “feel better equipped to discuss [the district vision] and develop plans around it going forward.” Participant B explained that various activities “sparked important questions and reflections.” Speaking about the way the collaborative discussion helped support participants when they were observing SWS, this participant said, “with a solid foundational understanding of these ideas, it was easy to point out examples of [learner-centered innovations] occurring in the classrooms.” These quotations suggest that both participants perceived benefits to their professional growth and understanding by participating in each session of this PL experience.

Table 5.3

Participant Responsiveness Ratings by Session

Participant	Session 1	Session 2	Session 3	Session 4
Participant A	9	9	9	9
Participant B	9	9	9	9

Discussion and Conclusions

The data pertaining to RQ1, “Are adequate resources available and being used to support ongoing intervention implementation and, if not, which resources are limited?,” indicate resource availability during sessions was sufficient for the completion of each study session. However, the time between sessions, when participants were asked to complete key activities, was filled with many other end-of-year events and professional duties that prevented the implementation of participants’ designed learner-centered innovations. Despite this incomplete implementation, participants were still able to engage in all planned sources of self-efficacy development discussed in Chapter Four, through collaborative discussion (verbal persuasion), observations of learner-centered classrooms (vicarious experience), and the design and refinement of their own learner-centered innovations (mastery experience).

The data pertaining to RQ2, “To what extent are intervention activities being adhered to by participants?,” suggests that participant adherence was very high up until the time between sessions three and four when extenuating circumstances, namely participants’ professional responsibilities in the last marking period of the school year, hindered their abilities to implement their designed innovations due to limited time. As noted above, participants were still able to engage with all sources of self-efficacy noted in the PL plan despite this obstacle. Additionally, the mastery experience of developing their own learner-centered innovations proved to be very fruitful for participants, and likely contributed to their positive perceptions of the overall PL experience.

Through this development process, Participant A created a plan for a long term research project in which students self-select a topic of study, learn about that topic through multiple

sources, and ultimately determine how they will demonstrate their learning to the class. The design of this project would allow students to manage their progress towards teacher-specified checkpoints along the way to completing the project, making it more manageable as these students were developing their independent work skills. This learner-centered innovation was highly aligned with three principles of LCE (see Chapter 1). First, this project allowed for highly personalized student experiences in which they would determine the content of their learning and could relate it to their interests and goals. Second, this project supported the development of transferable skills in the areas of self-regulation and project management. Third, this project was designed to cultivate shared responsibility for learning between the students and teacher, as students were expected to take on much of the responsibility of managing their progress.

Participant B's learner-centered innovation was focused on building in class routines and signage to reinforce and help students develop persistence and adaptive thinking. This plan involved student-created signs to hang in the classroom that would serve as reminders to students to keep trying or adjust their approaches when faced with an obstacle in their learning. Another element of this plan was that students would be presented with a question at the beginning of class each day that would encourage them to reflect on their successes and challenges in school, considering how to adapt and overcome these challenges. This learner-centered innovation reflects four principles of LCE. First, this innovation would promote the cultivation of authentic, experiential learning, in which students apply what they have learned in class about persistence and adaptive thinking to the work they do on a daily basis. Second, this plan allowed students to develop the transferable skill of adaptive thinking, adjusting to circumstances to solve problems and continue making progress in their learning. Third, students would be able to develop more

positive and productive affective experiences since they have tools and approaches they can use when facing a challenge, which otherwise can be very frustrating for students. Finally, this plan would allow students and the teacher to share responsibility in the classroom, as students would develop relevant signage based on their group conversations with the teacher about what cues would best remind them about persistence throughout class.

The data pertaining to RQ3, “To what extent do participants express satisfaction or dissatisfaction with the program and perceive benefits to their professional growth?,” suggests participants were satisfied with this PL experience during each session and at the conclusion of the study, reflecting significant participant responsiveness. This high degree of responsiveness was likely attributable to each participant perceiving the session activities as fulfilling opportunities to discuss and work with learner-centered concepts and the district vision in more depth than is normally afforded, as they noted in their survey responses. The sessions appear to have served as opportunities to break up participants’ work routines and focus on big picture goals rather than daily tasks.

There were two limitations worth noting in the process of collecting and analyzing implementation fidelity data. First, it is possible participants misunderstood the statements that were used to frame both adherence and responsiveness data. Although participants were encouraged to ask questions regarding the meaning and purpose of each questionnaire item, one or both participants could have interpreted items differently than they were intended. Based on their qualitative responses to the process evaluation questionnaire items, I believe this potential limitation was negligible because these responses indicated firm understandings of the meaning of each item. Second, it is possible that participants responded differently than they otherwise

would have due to their preexisting professional relationships with me, the PL facilitator. For example, their knowledge of the time and energy I had expended to develop this PL experience could have led them to respond more positively on the participant responsiveness item to show support for the work I had done. Although this limitation cannot be disproven, there are other ways to cultivate participant buy-in that could be utilized in situations in which the PL facilitator has no preexisting connections to participants, such as introductory activities.

Overall, the process evaluation data indicates a high degree of implementation fidelity, with the one notable exception being participants' challenges implementing their innovations. This challenge was the result of the many strains on time that manifest in teachers' professional lives, particularly in the final months of a school year when teachers have many additional responsibilities such as proctoring standardized tests and grading end of year assessments for their classes. Despite this exception, the high degree of implementation fidelity achieved in this study makes me confident that the process and underlying mechanism of change outlined in the theory of treatment (ToT) (Figure 3.2) was fulfilled through the PL experience, making it possible for this study to facilitate the intended outcomes for participants.

Outcome Evaluation

Two research questions guided analysis of the outcome evaluation data to address how participants perceived the effectiveness of the professional development experience:

- RQ4: To what extent does action research embedded in a professional learning community increase teacher self-efficacy?
- RQ5: How does action research embedded in a professional learning community change teachers' perceptions of learner-centered education and its operationalization in their

classrooms?

Teacher self-efficacy (RQ4) refers to teachers' beliefs in their ability to effectively complete tasks related to their professional roles, such as managing classrooms or effectively motivating students (Bandura, 1986; Tschannen-Moran & Chan, 2014). Participant sensemaking (RQ5) is defined as teachers' cognitive and affective interpretations and responses to learner-centered education, the district's vision, and their roles in enacting that vision in their classrooms (Schmidt & Datnow, 2005; Siciliano et al., 2017; Weick et al., 2005).

Teacher self-efficacy and sensemaking data was collected at the beginning of the first PL session and near the end of the final PL session, using the mixed methods outcome evaluation questionnaire (see Appendix F) and culminating focus group. The questionnaire was administered at the beginning of the first PL session and end of the final PL session in accordance with the pre-posttest design. The focus group occurred at the end of the final PL session and allowed participants to reflect on and share their experiences in this study. This focus group was recorded and then transcribed using Otter.ai transcription software.

Teacher Self-Efficacy Quantitative Questionnaire Results

The small sample size of this study allowed for analysis of the quantitative self-efficacy data for each participant individually, giving greater insight into the individual changes observed in each teacher. Participant A's mean composite score on the quantitative teacher self-efficacy items increased from 5.42 (closest to the "Some Degree" response on the scale) to 7.75 (closest to the "Quite a Bit" response on the scale). This represents a net increase of 2.33 on Participant A's mean teacher self-efficacy score. Although quantitative data analysis did not include inferential statistics, this net increase is promising regarding the impact of the PL experience. For

additional information regarding changes in Participant A's teacher self-efficacy from the beginning to the end of the PL experience, see Table 5.4. This data is also visualized in Figure 5.1, showing the increase in Participant A's self-efficacy scores in terms of mean, median, mode, as well as a decrease in standard deviation. In Figure 5.1, the median and mode lines are identical for Participant A, resulting in the median line being hidden.

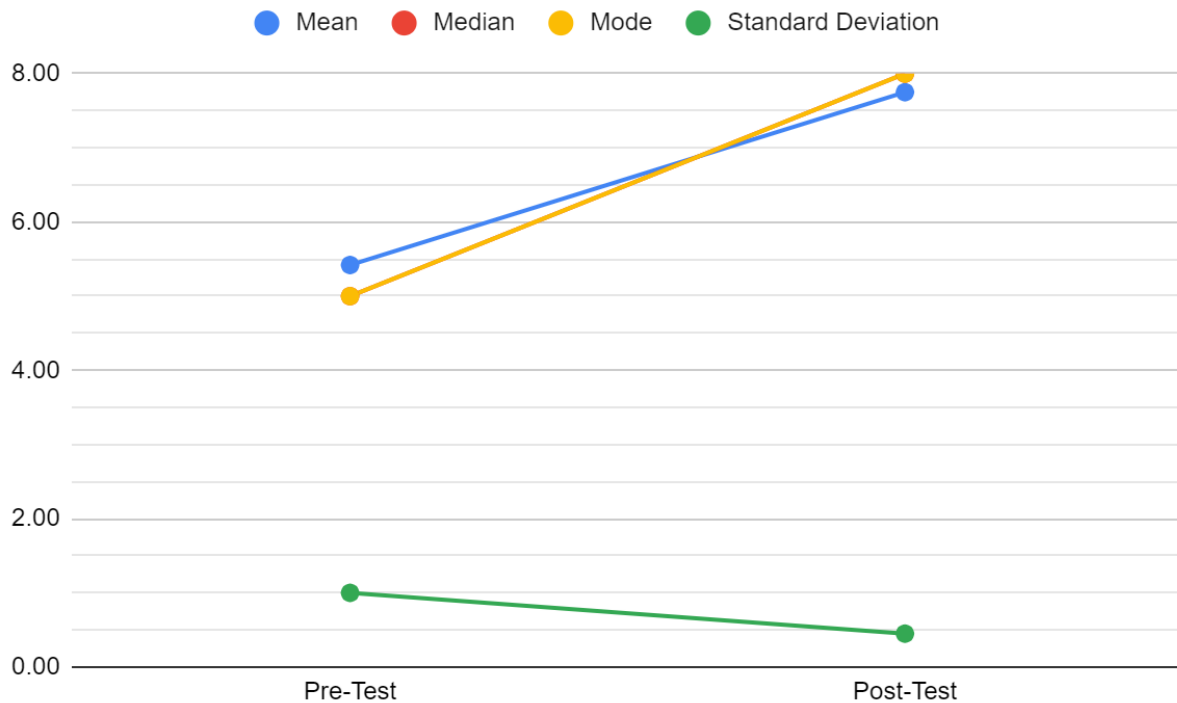
Table 5.4

Participant A Self-Efficacy Pre-Posttest Comparison

	Mean	Median	Mode	Standard Deviation
Pretest	5.42	5.00	5.00	1.00
Posttest	7.75	8.00	8.00	0.45
Difference	+2.33	+3.00	+3.00	-0.55

Figure 5.1

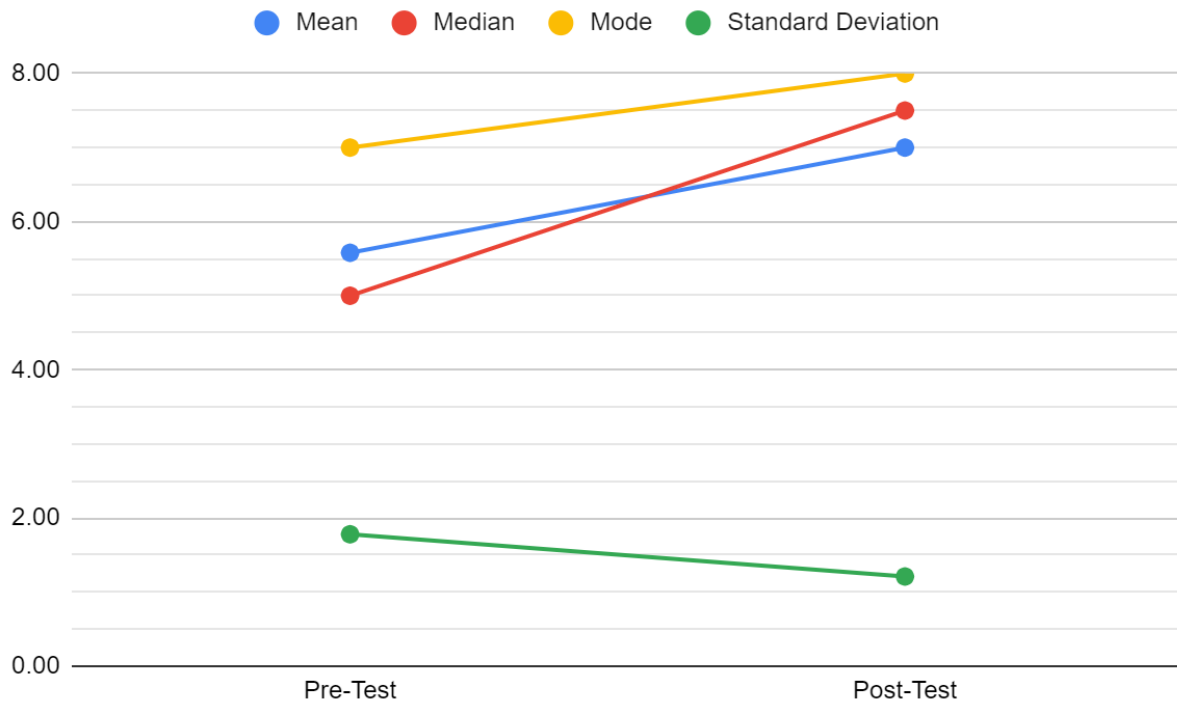
Participant A Change in Self-Efficacy Responses



Participant B's mean composite score on the quantitative teacher self-efficacy items increased from 5.58 (closest to the "Some Degree" response on the scale) to 7.00 (the "Quite a Bit" response on the scale). This represents a net increase of 1.42 on Participant B's mean teacher self-efficacy score. Again, the small sample size and resulting focus on descriptive statistics precludes the option of making statistical inferences about the reliability or generalizability of these findings, but it is a promising outcome of the PL experience to see both participants increase their teacher self-efficacy as indicated by this quantitative data. Other descriptive statistics regarding Participant B's change in teacher self-efficacy is included in Table 5.5 and visualized in Figure 5.2.

Table 5.5*Participant B Self-Efficacy Pre-Posttest Comparison*

	Mean	Median	Mode	Standard Deviation
Pretest	5.58	5.00	7.00	1.78
Posttest	7.00	7.50	8.00	1.21
Difference	+1.42	+2.50	+1.00	-0.57

Figure 5.2*Participant B Change in Self-Efficacy Responses*

Teacher Self-Efficacy Qualitative Questionnaire Findings

A thematic coding process was used for both the self-efficacy open-ended items on the questionnaire and the focus group transcript. Due to the concise nature of responses to the open-ended questionnaire items, with each participant's responses being approximately three or four sentences, only one round of coding was necessary. The coding table developed through this process (see Appendix I) includes all four codes pertaining to teacher self-efficacy or teacher sensemaking, as well as representative examples of each code and the themes that emerged. These four codes were “uncertainty regarding best practices,” “‘somewhat confident’ in understanding,” “importance of learner agency,” and “‘more confident’ in understanding of district vision.” The two codes pertaining to teacher self-efficacy resulted in two themes: (a) focusing on barriers to operationalizing LCE and (b) increased confidence in abilities to operationalize LCE. These themes emerged from the pretest and posttest questionnaire, respectively.

Focusing on Barriers to Operationalizing LCE

On the pretest questionnaire, both participating teachers' responses focused on barriers to operationalizing learner-centered education. Both specifically noted the challenge of meeting all students' needs in a learner-centered environment, because students have greater autonomy. For example, Participant A wrote LCE is something they “struggle with because of the varied ability of students.” They elaborated by adding, “Sometimes it is difficult to balance students who are so capable with students who need someone to be involved in each step.” Participant B offered a similar response when sharing, “I question how I can operate in a learner-centered way that best fits the needs of my students.” This focus on barriers by both participants appears to serve as a

rationale against experimenting with learner-centered innovations, as neither participant identified their own ability to overcome such obstacles in their pretest responses.

Increased Confidence in Abilities to Operationalize LCE

The second theme, identified in the posttest responses, is that both participants exhibited increased confidence regarding their abilities to operationalize LCE. Participant A noted they “feel fairly confident.” Participant B elaborated when responding, “Although I think it can be difficult to try to implement [learner-centered] practices in the classroom...I feel confident in implementing small practices that move toward the district vision one piece at a time.”

Teacher Self-Efficacy Focus Group Findings

The transcript derived from the culminating focus group, required two rounds of coding due to the length of the transcript. The coding table developed through this process (see Appendix J) includes all pattern codes, examples of direct quotations for each code, and the themes that ultimately emerged through this process. The first round of coding resulted in the identification of three codes pertaining to teacher self-efficacy, which I was then able to refine to two pattern codes and, finally, a single theme. The theme that emerged was that participants had a growing belief in their abilities to operationalize LCE and to affect positive change through that process. For example, Participant A noted that “participating in this [PL experience] has made me more confident in my ability to use learner-centered practices.” Participant B added their belief that if teachers and other stakeholders are “intentional about [operationalizing LCE] that we’ll get there,” with “there” referring to the kind of learning environments outlined in the district vision. This theme corroborates both the qualitative and quantitative data collected via the posttest questionnaire and suggests positive growth regarding participants’ teacher

self-efficacy.

Teacher Sensemaking Questionnaire Findings

All data pertaining to teacher sensemaking was qualitative and analyzed using a thematic coding process. Similar to the qualitative data regarding teacher self-efficacy from the questionnaire, the qualitative data from the questionnaire regarding teacher sensemaking only required one round of coding due to the concise nature of responses. (See Appendix I for the complete coding table.) I developed four codes, two in the pretest results and two in the posttest results. From this single round of coding, one theme emerged in the pretest data and another emerged in the posttest data: (a) basic understanding of LCE but uncertainty regarding operationalization and (b) increased understanding and nuanced consideration of LCE and its operationalization.

Basic Understanding of LCE but Uncertainty Regarding Operationalization

As noted, the pretest data indicates that both participants perceived they had some degree of understanding regarding LCE and the district's vision but were unsure about how to best operationalize the vision in their classrooms. Participant A noted, "There are days that I think I know [about the district vision and learner-centered education], but then something happens to make me feel less confident about if what I am doing aligns to our vision." This echoes the sentiments of Participant B, who wrote, "I feel well aware of where we want our students to be but sometimes question what the best methods are to get them there." Based on this data, the key challenge for both participants prior to the PL experience appeared to be identifying ways to translate their abstract knowledge of LCE and the district vision into classroom practice.

Increased Understanding and Nuanced Consideration Of LCE and its Operationalization

In the posttest data, the key theme that emerged was participants' increased understanding and more nuanced consideration of key elements of LCE and the district vision. For example, Participant A commented, "I think that considering how my students can help drive their learning experiences is an important piece of making sure it is learner-centered." This is particularly notable given that Participant A identified their students' needs as an obstacle to creating a learner-centered environment in their pretest response. Participant B wrote, "I feel a lot more confident that I understand learner-centered education and the district vision now that I have participated in this study."

Teacher Sensemaking Focus Group Findings

As previously noted, two rounds of coding were conducted for the transcript derived from the focus group discussion. (See Appendix J for the complete coding table). In the first round of coding, I identified 14 unique codes in the data that pertained to teacher sensemaking. The relatively larger number of codes identified for teacher sensemaking (i.e., 14 codes) compared to teacher self-efficacy (i.e., 3 codes) is likely due to the scope of each construct, with sensemaking being more broadly defined than self-efficacy (Bandura, 1986; Weick, 1995). After generating this initial list of 14 codes, I identified five pattern codes. From these five pattern codes, two themes emerged: (a) deeper understanding of LCE and its operationalization and (b) early stages of a paradigm shift.

Deeper Understanding of LCE and its Operationalization

The data suggests participants developed a deeper understanding of LCE and its operationalization. Participant A, reflecting on conversations had during the PL sessions, stated,

“When we talked about that continuum of the [district’s learning] dispositions and how things might work for the whole district, it really helps you because then it doesn't feel like, ‘Oh, I have to do all of it.’ And more near term, this could be a team effort.” This consideration of collaboratively developing learner-centered environments with other members of the teaching team indicates Participant A has taken time to think through other ways in which LCE could be operationalized in classrooms and the district as a whole. Participant B summarized their growth in understanding through the PL experience when they said, “Before, I had this belief that ‘I already know [about the district vision] and do that.’” They then noted that, following the PL experience, they understood “There’s so much to [the district vision and LCE]. It’s very complex...but I feel like after doing this, I just have a deeper understanding of it, a better idea of what each little piece of learner-centered education can really look like.” This theme of deeper understanding corroborates the findings from the qualitative questionnaire.

Early Stages of a Paradigm Shift

The second theme that emerged was that participants appeared to be in the early stages of a paradigm shift regarding their thinking. In the context of this usage, a paradigm shift is a change in mindset and thought patterns regarding a topic. In this case, that topic is the district vision and, by extension, LCE. Participant A explained it as “having a different mindset and looking at things a bit differently, being intentional about [developing each student] more as a whole person.” As part of this paradigm shift, Participant B noted thought patterns that limited their operationalization of LCE in the past, such as brushing off the district vision and saying things like, “Oh, yeah, I get it, I understand” without actually taking any concurrent action. Another part of this paradigm shift was participants building an understanding of the importance

of LCE, such as when Participant B stated, “Those things that a learner-centered classroom helps to embody in kids is what we need and will benefit [them] in the future.” These two themes, participants’ deeper understanding of LCE and the emergence of a paradigm shift, suggest the PL experience had its intended impact.

Further Insight on the Implementation Process

In addition to the themes that emerged related to research questions four and five, the focus group data also revealed some insights pertaining to the implementation process. As indicated in the coding table (see Appendix J), the coding process resulted in one initial code pertaining to participant responsiveness and two initial codes pertaining to resource availability. I then combined the two codes pertaining to resource availability into one pattern code (Miles et al., 2018). Ultimately, one theme emerged for participant responsiveness and one theme emerged for resource availability. These two themes were (a) the perception of value in the PL experience and (b) time as the primary limiting factor in activity completion.

Perception of Value in the PL Experience

Regarding participant responsiveness, the theme that emerged through the focus group data was the perception that the PL experience was valuable for professional growth. This data came primarily from Participant B, who generally spent more time in the focus group speaking about the implementation process. In that conversation, they shared, “I feel like I really did get something out of it, and that doesn’t happen all the time. I feel like all the activities were meaningful. Nothing was unnecessary or extra.” Though Participant A did not share much additional insight relevant to participant responsiveness, the belief of Participant B that the PL experience was meaningful aligns with what both participants stated in the process evaluation

questionnaire.

Time as the Primary Limiting Factor

The theme that emerged pertaining to resource availability was that time was the primary limiting factor throughout the PL experience. Again, this data came primarily from Participant B, and this theme applied to both the amount of time participants had to devote to independent activities between sessions and the amount of time we had to conduct some of the activities during the PL sessions. Regarding the amount of time participants could commit to between-session activities, Participant B said, “I wish we had more time just to implement [our learner-centered innovations].” Regarding the amount of time spent on activities during the sessions, Participant B noted that the SWS was so “multifaceted” that it was “hard to observe everything in a short amount of time.” This suggests that participants may have benefited more from classroom observations if we had spent additional time in the SWS. Although process evaluation was not the primary goal of the focus group discussion, this data is valuable as both of these findings corroborate the implementation data collected via the process evaluation questionnaire and indicate at least some degree of consistency of participant responses across measurement instruments.

Other Emergent Themes

Due to the semi-structured nature of the focus group, the participants and I were able to explore other topics that arose during the conversation. This resulted in the emergence of some themes that do not relate to the research questions but are still valuable to consider when assessing the overall impact of the intervention and considerations for future PL experiences. Through the process of coding the focus group transcript, I identified 18 initial codes that were

insightful but not directly relevant to the research questions that framed this study. (See Appendix J for the complete coding table). I combined these 18 initial codes into eight pattern codes and, from the eight pattern codes, three themes emerged: (a) the importance of framing PL experiences with teacher needs and best practices, (b) the value of technology for supporting teacher learning, and (c) plans to continue experimenting with learner-centered innovations.

The Importance of Framing PL Experiences with Teacher Needs and Best Practices

The first theme that emerged was the importance of framing PL experiences with teachers' actual professional learning needs and identified best practices. As indicated by the needs assessment data (Chapter 2) and the extant literature (Chapter 3), educators need access to collaborative learning, support as well as concrete guidance from facilitators, and opportunities to reflect on their professional experiences (Bayar, 2014; Borko et al., 2010; Darling-Hammond et al., 2017). Regarding the importance of collaborative PL experiences, Participant A noted that it was "helpful" to have "each other to bounce ideas off of," and Participant B said, "I loved our discussions." Regarding guidance and support from facilitators, Participant B said, "Part of why this was so successful and was so valuable was because [the PL facilitator] was a leader in talking about learner-centered innovation, because the SWS is something [the facilitator] has been doing." Lastly, regarding opportunities for reflection, both participants indicated it was important that we took time to discuss our existing perceptions of learner-centered education and the district vision when starting the PL experience. For example, Participant A said that when we "worked through all of those pieces [of the district vision], especially starting out to make sure we were all on the same page and talked about our understanding and challenged ideas, I thought that was a great way to start things." These and many other comments made during the focus

group discussion indicated that participants responded positively to the PL experience because it was developed with a focus on their needs and identified best practices.

The Value of Technology for Supporting Teacher Learning

The second theme that emerged was the value of technology in supporting educators' professional learning. One technology tool participants were particularly drawn to was ThingLink, which was used to collaboratively develop definitions and add notes pertaining to elements of the PoG and LBs. This technology tool was relatively new to each participant, with neither using it regularly as part of their classroom instruction. Participant A enjoyed that it allowed us to "go back and see our notes" and that we could create popup windows with our ideas "on top of...the visual" of the district vision graphics. Participant B added that it "enhanced" the PL experience because it "provided a visual" and served as an "engagement aspect." This data indicates that technology tools can play a role in supporting and engaging educators during PL experiences.

Plans to Continue Experimenting with Learner-Centered Innovations

The final theme that emerged was that both participants have plans to continue developing and using learner-centered innovations in their classrooms. For example, Participant A noted that they "still want to implement the activities [they] were coming up with and that's going to be a valuable piece we can take away from this and use." Participant B added that, "Although I didn't have time to implement...that is something that I 100% plan to use for next [school] year." This suggests that this intervention was successful in achieving the intermediate outcome outlined in the ToT (Figure 3.2).

Discussion of Findings

The results and findings from this study indicate some meaningful changes in both participants' teacher self-efficacy and sensemaking processes regarding LCE and its operationalization. The sections below explore answers to research questions four and five, respectively. An overview of the study conclusions are also represented in Table 5.6.

Teacher Self-Efficacy

Research question four was, "To what extent does action research embedded in a professional learning community increase teacher self-efficacy?" Results and findings indicate that action research embedded in a PLC, specifically this intervention design, can lead to meaningful increases in teacher self-efficacy. This conclusion was drawn from both questionnaire and focus group data that suggests participants became more confident in their general teacher self-efficacy as well as their confidence in their ability to operationalize LCE over the course of the intervention. The qualitative data, in particular, indicates participants' perception that it was the intervention itself that caused this increase in self-efficacy.

Teacher Sensemaking

Research question five was, "How does action research embedded in a professional learning community change teachers' perceptions of learner-centered education and its operationalization in their classrooms?" The results and findings indicate that this approach to professional learning can support teachers' sensemaking processes of LCE. Specifically, analysis of the questionnaire and focus group data suggests this approach allowed participants to gain deeper understandings of LCE and shift their mindsets regarding LCE and the process of operationalization. Again, the qualitative data highlights participants' perceptions that it was the

intervention itself, rather than other factors outside of the study, that facilitated the sensemaking process.

Table 5.6

Overview of Conclusions

Findings	Data Source	Research Questions	Conclusions
Pretest teacher self-efficacy items averaged 5.42 (“Some Degree” of confidence) on the pretest, and 7.75 (“Quite a Bit” of confidence) on posttest.	Pre-Posttest Questionnaire	RQ4	Participants’ teacher self-efficacy and their beliefs in their abilities to operationalize LCE increased during the time between the beginning and end of the study, and this is likely attributable to the intervention.
Pretest responses to open-ended questionnaire items focused on barriers to operationalization; posttest responses emphasized increased confidence in operationalizing LCE.	Pre-Posttest Questionnaire	RQ4	
Both participants had growing belief in abilities to operationalize LCE and affect positive change.	Focus Group	RQ4	
On pretest, participants felt they had some understanding of LCE and the district vision but were uncertain about how to operationalize; posttest responses emphasized greater understanding and more nuanced thinking about LCE and the vision.	Pre-Posttest Questionnaire	RQ5	Over the course of this study, participants developed deeper, more nuanced understandings of and shifting mindsets regarding LCE and how to operationalize it as outlined in the district vision, and this shift is likely attributable to the intervention.
Participants indicated during the focus group that they developed deeper understandings of LCE and its operationalization.	Focus Group	RQ5	
Early indications that participants are experiencing a paradigm shift regarding how they think about LCE.	Focus Group	RQ5	

Implications

This study resulted in a number of both scholarly and practical implications. Scholarly implications pertain to both the theoretical framework and theory of treatment. Practical implications have the potential to inform future professional learning experiences in both this district and other educational contexts. Following these implications, I address the limitations of this study. Finally, I provide some recommendations for future research based on this study.

Scholarly Implications

Sociocultural theories (Gee, 2008; Perry, 2012; Vygotsky, 1978) and self-efficacy theories (Bandura, 1986) were an appropriate framework for guiding development of the PL experience. This is likely due to their alignment with empirically supported best practices in PL. This study also reinforces the effectiveness of best practices for facilitating teacher PL as identified in prior work (Bayar, 2014; Borko et al., 2010; Darling-Hammond et al., 2017), as this intervention appears to have had the intended effects and utilized many of those best practices. More specifically, this study indicates that sociocultural PL, as discussed in Chapter Three, supports opportunities for teachers to engage in various sources of self-efficacy, thus increasing their self-efficacy. This study also reinforces previous research indicating that greater teacher self-efficacy is associated with increased willingness and confidence in experimenting with learner-centered innovations (Hsiao et al., 2011; Tschannen-Moran & Chan, 2014).

Additionally, the changes in participants' self-efficacy, as well as changes in their attitudes and knowledge regarding LCE, indicate the potential to achieve the intermediate and distal outcomes outlined in the ToT. Specifically, both participants indicated their intent to continue experimenting with learner-centered innovations even after the study concluded. If both

teachers follow through on this intent, there is a strong possibility that these teachers' continued experimentation will lead to the diffusion of learner-centered innovations to other classrooms in the middle school and, eventually, other schools in the district as teachers and students share their experiences with LCE. Complete operationalization of LCE by teachers in every district classroom would likely take numerous years, but the data from this study indicates the initial steps in this process are already underway.

Practical Implications

There are several noteworthy implications that can help inform future professional learning experiences for teachers. First, this study highlights the potential benefit of creating a pilot program in which to develop innovative practices that can then be shared with others in the context. Although this takes a significant investment of resources and may not be feasible in all contexts, this study shows how a pilot program can serve as a source of vicarious learning for teachers. Specifically, observations of the SWS provided concrete examples of learner-centered innovations and informed group conversations about LCE and operationalization.

Second, this study indicates there is potential for significant innovation through consistent, small steps aligned to an ambitious vision of teaching and learning. Specifically, this PL experience supported teachers in beginning to operationalize learner-centered innovations in their classrooms. When contextualized with the theory of treatment, which outlines the process by which the short term goals achieved in this study can lead to the intermediate and distal outcomes, the processes undertaken in this study can be viewed as early steps in a truly transformative change process.

Third, this study reinforces the need to give teachers time and support to adjust to novel

educational approaches and develop aligned practices. Specifically, regarding support, it appears essential to provide adequate guidance via learning resources and experiences to help teachers align their actions with the vision. In order to balance out this guidance with the autonomy teachers deserve as skilled professionals, it is also essential to create a vision that provides the flexibility teachers need to adapt it to their classroom without straying away from the essential goals of the vision. The vision of teaching and learning created by the district was adequately flexible, and this intervention provided the formalized guidance that has not been consistently available in teachers' daily professional lives.

Limitations

Although this study appears to have achieved the desired outcomes, there are a number of important limitations to consider. One limitation is that my preexisting professional relationships with both participants could have skewed participant responses on items and questions pertaining to the quality of the study design and my facilitation skills. This potential bias could also have been exacerbated because it was a relatively small study in which both participants and I were in close contact for the majority of each PL session. However, I do not believe any potential positive bias could have accounted for all the growth made by participants based on my observations and analysis of the data.

Another limitation is the small sample size of this study. There are several factors that likely reduced teacher interest in study participation. First, the fact that all study sessions took place at the middle school made teachers in other district buildings less likely to join the study, as they would have had to arrange transportation to and from their buildings to the middle school. This obstacle suggests the value of creating a PL experience in which teachers can participate

virtually or transportation can be arranged for them. Second, the intervention started in April, in the final marking period of the school year. The final marking period of the school year always involves culminating activities across classrooms and the district as a whole that make it a particularly busy time for teachers. By the spring, it appears many teachers did not have the desire or ability to add any other tasks to their already full plates. From my own experience and observations, this high-pressure time of year in schools can lead to feelings of exhaustion or burnout for many teachers, feelings that seemed to be exacerbated in the district as teachers, administrators, and families navigated upheaval in the school experience due to the COVID-19 pandemic.

Another limitation is the potential misalignment between the questionnaire items and the variable of teacher self-efficacy as it pertains to operationalizing learner-centered innovations. The items pertaining to teacher self-efficacy developed by Tschannen-Moran and Woolfolk Hoy (2001) do not specifically address the use of innovative teaching practices. However, prior research indicates that increases in teacher self-efficacy do make teachers more amenable to classroom innovation (Hsiao et al., 2011; Tschannen-Moran & Chan, 2014), therefore serving as a valid indicator. The results of this study reinforce this connection, since both general teacher self-efficacy and self-efficacy regarding learner-centered innovation increased for both participants.

Additionally, there are a collection of limitations implicit to the research design. First, the quasi-experimental design did not allow me to eliminate all other plausible explanations for changes in participant self-efficacy and sensemaking. Although participants did not participate in other professional learning experiences during the course of the study, it is possible that secular

trends in the community or natural maturation of participants' knowledge and thinking led to their growth (Rossi et al., 2019). Second, the study findings are not generalizable due to the small sample size and the resulting approach to statistical analysis.

Finally, the participant selection process was highly vulnerable to selection bias (Rossi et al., 2019; Shadish et al., 2002). Participants in this study volunteered, meaning they were likely more engaged in this study than other teachers in the district would have been. For that reason, the growth experienced by both participants does not necessarily indicate other teachers would have had similarly positive experiences and outcomes. Despite this limitation, I believe this study can be informative to others in educational contexts who are looking to design PL experiences or jumpstart learner-centered innovation.

Recommendations

A number of recommendations have emerged from this study. First, similar studies should be conducted in other educational contexts to determine the potential transferability of these results. Second, this study should be replicated to determine the impact of participants actually operationalizing their learner-centered innovations, since participants did not have time to do so in this study. Additionally, future versions of this study could involve multiple rounds of the plan-do-study-act (PDSA) cycle, allowing participants to develop more innovative practices and more deeply ingrain the learner-centered approach in their classrooms.

Future studies should also utilize more robust research designs. This could involve larger sample sizes and a comparison group that would allow researchers to draw stronger conclusions about the impact of the intervention. A longitudinal follow-up would also allow researchers to determine if the immediate outcomes were lasting and if they led to the theorized intermediate

and distal outcomes.

Finally, although the Teacher Sense of Efficacy Scale (TSES) (Tschannen-Moran & Woolfolk Hoy, 2001) appears to be a valid instrument for identifying teacher confidence for operationalizing LCE, I believe it would be helpful to explore other instruments that more directly address teachers' beliefs about classroom innovation and their abilities to operationalize LCE. This might involve the development and validation of survey items more specifically focused on developing and using innovative, learner-centered teaching practices. Research on learner-centered education is progressing, and these recommendations should serve as a blueprint to continue that progress and help catalyze the development of learner-centered education systems that adequately prepare all learners for modern life.

Conclusion

Learner-centered education is understood as an approach to teaching and learning that can modernize conventional schooling and better prepare students for life in the 21st century (An & Reigeluth, 2011; Papert, 1993; Rose, 2016; Watson & Reigeluth, 2008). The focus of this dissertation was two-fold. The first focus was identifying the needs of teachers in a small Pennsylvania K-12 school district as they sought to operationalize LCE in classrooms. The second was to develop a professional learning experience that would address these teachers' needs and allow them to expand their use of learner-centered approaches. The resulting intervention study was centered on an action research-oriented professional learning community designed to support teachers through the sensemaking process (Weick, 1995) of understanding LCE and build their self-efficacy (Bandura, 1986) for developing and implementing learner-centered innovations. In this intervention study, sociocultural learning approaches, as

proposed by Raphael et al. (2014), were understood to support the development of teachers' self-efficacy and cultivate participant experimentation with learner-centered innovations. Through four PL sessions, participants engaged in collaborative discussions, classroom observations, and the development of their own learner-centered innovations.

Several conclusions can be drawn from the results of this study. First, action research embedded in a PLC can lead to meaningful increases in teacher self-efficacy and can support teachers' sensemaking processes of LCE. Second, this study reinforces the applicability of sociocultural and self-efficacy theories in designing PL experiences. Third, this study highlights the value of creating a SWS to develop innovative practices, the potential of using consistent and small steps to create significant pedagogical change, and the importance of providing teachers with the time and support necessary to adjust to novel educational approaches.

Learner-centered education has the potential to positively transform the American education system, better preparing students for 21st century life by equipping them with the knowledge, skills, and habits of mind necessary to pursue their unique visions of personal success and fulfillment. By cultivating effective professional learning opportunities for educators, schools can support this learner-centered transformation. Although large scale change often seems insurmountable, this dissertation study provides a roadmap showing how PL that encourages learner-centered innovation in individual classrooms could be implemented across schools and districts to catalyze widespread adoption of learner-centered education.

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Appendix A

Survey Items

Part I - Teacher Beliefs About Learners, Learning, and Teaching

1. (1) Students have more respect for instructors they see and can relate to as real people, not just as teachers.
2. (3) I can't allow myself to make mistakes with my students.
3. (4) Students achieve more in classes in which instructors encourage them to express their personal beliefs and feelings.
4. (5) Too many students expect to be coddled in school.
5. (6) If students are not doing well, they need to go back to the basics and do more drill and skill development.
6. (8) It's impossible to work with students who refuse to learn.
7. (11) Even with feedback, some students just can't figure out their mistakes.
8. (12) My most important job as a teacher is to help students meet well-established standards of what it takes to succeed.
9. (18) Knowing my subject matter really well is the most important contribution I can make to student learning.
10. (19) I can help students who are uninterested in learning get in touch with their natural motivation to learn.
11. (23) Innate ability is fairly fixed and some children just can't learn as well as others.
12. (28) Being willing to share who I am as a person with my students facilitates learning more than being an authority figure.
13. (30) My acceptance of myself as a person is more central to my classroom effectiveness than the comprehensiveness of my teaching skills.
14. (32) Accepting students where they are -- no matter what their behavior and academic performance -- makes them more receptive to learning.
15. (34) Seeing things from the students' point of view is the key to their good performance in school.

Note: Responses will be on a four-point Likert scale from 1 (Strongly Disagree) to 4 (Strongly Agree).

Part II - Teacher Perceptions of Their Classroom Practices

1. I demonstrate to each student that I appreciate him/her as an individual. (Creates positive interpersonal relationships)
2. I allow students to express their own unique thoughts and beliefs. (2 Honors student voice, provides challenge, and encourages perspective taking)
3. I help students clarify their own interests and goals. (3 Encourages higher-order thinking and self-regulation)
4. I encourage students to work with other students when they have trouble with an assignment. (4 Adapts to individual developmental differences)

5. I demonstrate to students that I care about them.
6. I encourage students to challenge themselves while learning.
7. I help students understand how to link prior knowledge and new information in ways that are meaningful to them.
8. I encourage students to express their preferences for different ways of learning.
9. I appreciate my students for who they are beyond whatever their accomplishments might be.
10. I help students understand different points of view.
11. I teach students how to deal with stress that affects their learning.
12. I encourage students to think for themselves while learning.
13. I encourage students to monitor and regulate their own thinking and learning processes.
14. I get to know each student's unique background.
15. I am able to change my teaching when students are having difficulty.
16. I treat students with respect.

Note: Responses will be on a four-point Likert scale from 1 (Almost Never) to 4 (Almost Always).

Appendix B

Semi-Structured Interview Questions

- 1. How well do you feel you understand the Learning Beliefs and Profile of a Graduate?**
 - a. Which specific aspects of the Profile of a Graduate are especially clear or confusing? Why?
 - b. Which specific aspects of the Learning Beliefs are especially clear or confusing? Why?
 - c. Overall, how well do you feel other teachers understand the PoG and Learning Beliefs?
- 2. For what reasons do you think the district developed the PoG and Learning Beliefs?**
- 3. How similar or different do you feel your own educational values are from the district's Profile of a Graduate and Learning Beliefs?**
 - a. Which, if any, specific elements of the PoG do you agree with or question? Why?
 - b. Which, if any, specific elements of the Learning Beliefs do you agree with or question? Why?
 - c. How do you think other teachers feel about the Profile of a Graduate and Learning Beliefs?
- 4. Which, if any, elements of the learning beliefs do you already use in your classroom?**
 - a. Which elements, if any, do you feel are already commonly used in the middle school?
- 5. Which elements of the Profile of a Graduate do you think students develop in your class?**
 - a. Which elements, if any, do you feel students need to develop more when in middle school?
- 6. How do you think your role might change as a teacher in a learner-centered environment?**
 - a. How do you feel about that?
 - b. How prepared do you feel for this change? What additional supports would be helpful?

Appendix C

Interview Coding Table

Codes	Samples	Themes
Macro-level pressures	"All the teachers and all the administrators everybody involved feels a responsibility to teach the core curriculum."	Competing inputs and structural barriers across system levels hindering operationalization of the vision.
Feels supported	"I feel like we work in a place that's comfortable to take risks and test things out."	
Limitations of traditional classroom structures	"In the traditional classroom, just me in a class of 30 students, I feel it's much more difficult for me to accomplish these goals."	
Importance of time	"If I wanted some kids who were like really like no this is what we want to do I mean I would need the time in my day I feel like to meet with them."	
Importance of other resources	"I would need to spend some money on some digital accounts for them and that's the kind of flexibility I don't have right now."	
Needs reassurance	"As long as there was a support system you know someone to kind of reinforce like you are or aren't [on track], how it could be better."	General teacher understanding of the district vision, though their interpretations differ significantly.
Understanding of the vision	"I think I understand them very well. Actually, past the point of understanding; I think I can apply them."	
Purpose of vision	"Guiding light of where we need to be in the 21st century and the ever changing world that we have."	
Open to interpretation	"I think that there are a lot of different interpretations of what this profile of a graduate means and so many teachers are looking through their own filter, their own experiences, and seeing something different than other teachers."	
Degree of alignment	"I think that if it would ever be transformed fully over there should be some opportunities for students to thrive with more of the direct kind of instruction."	Beliefs aligned with their perceptions of the vision, though there is resistance from some regarding what we would lose through transforming the educational model
Fear of change and the unknown	"When it comes to the newness or unknown, I think that it might drive some anxiety in people. You can hear the worries. For so long it seems like education has been a prescribed method, so to open it up...just leaves so many questions for people which then can stir that anxiety and that worry that I hear in conversation sometimes."	Range of emotional responses, but significant unease about potential change is common.
Overwhelming	"I think sometimes when it gets sent out all at once it might not even be the content that's on these documents, it's the perception of 'Oh my god, what do I have to do now? What do they want me to change and do different now?'"	

Excited	"It's exciting because you're creating kids who are taking more ownership in their learning and you're creating a classroom that's more learner-centered."	
Feelings about change	"I guess...a nervous excitement. I'm not opposed to it in any way."	
Colleague responses to vision	"I think some teachers that I've spoken with are threatened by this, looking at this as saying 'What you're doing is wrong.' I think there's another set of teachers who look at this and say 'Well I'm already doing all that,' and I think there's a third set of teachers who sometimes dismiss anything new coming in as 'Oh well, these are just the new buzzwords it's not really going to change anything that's happening in my classroom.'"	
Influence of personality	"I think a lot of it too has to do with the personality of the teacher and what they're most comfortable doing."	
Alignment with past experiences	"For all teachers there's a level of insecurity with that in that that's not the way most teachers were trained or started their career, and so there's some insecurity of, you know, 'Are they still going to be learning? Am I still doing my job?'"	
Readiness for change	"I would love to learn more. I'm happy to try things."	
Little impact of vision	"It just doesn't seem to be at the forefront of [teachers'] minds, like when they're planning, unless it's like a district day where we're focusing on it."	
Degree of operationalization	"I feel like I'm moving along on that spectrum, but I'm not anywhere near where I want to be."	
Barriers to operationalization	"I want to get into letting the kids be able to learn at their own pace and do everything that way and have full control learning in some ways, but at the same time I'm not there because either the kids aren't engaged with that activity...or I don't know, maybe there are aspects of my [lessons] that aren't great."	Teachers uncertain about how to increase their degree of operationalization of the district vision.
Vision of operationalization	"I feel like I would become more of a coach rather than a content distributor...who really understands [their] subject but also understands how to create a more well-rounded student."	
Conflicted internal dialogue	"I think 'Are they still going to be learning that way and am I still doing my job?' but at the same time also knowing 'Yes, you are still doing your job and yes, they are learning.'"	
Collaboration	"If we could sit down with someone and say 'Okay, this is how we would want to hit certain things, like be able to bounce ideas off of someone.'"	Want opportunities to collaborate and see the vision in action.
Experiential learning	"The more we seek out opportunities as a district to get the teachers to see existing models of what it might look like, that can help us all."	

Appendix D

Resource Availability Checklist

Session 1		
Resource	Available?	Notes
Classroom Coverage for Each Participant		
Meeting Space for PLC		
Individual Work Space for each Participant		
Instructional Materials for Session		

Session 2		
Resource	Available?	Notes
Classroom Coverage for Each Participant		
Meeting Space for PLC		
Individual Work Space for each Participant		
Instructional Materials for Session		

Session 3		
Resource	Available?	Notes
Classroom Coverage for Each Participant		
Meeting Space for PLC		
Individual Work Space for each Participant		
Instructional Materials for Session		

Session 4		
Resource	Available?	Notes
Classroom Coverage for Each Participant		
Meeting Space for PLC		
Individual Work Space for each Participant		
Instructional Materials for Session		

Appendix E

Process Evaluation Questionnaire

I have completed ALL required activities both during and between sessions to the best of my ability.

Strongly Disagree									Strongly Agree
1	2	3	4	5	6	7	8	9	

Please explain your answer below:

I believe this professional learning experience is beneficial to my professional growth and I am still interested in participating.

Strongly Disagree									Strongly Agree
1	2	3	4	5	6	7	8	9	

Please explain your answer below:

Appendix F

Outcome Evaluation Questionnaire

Directions: Please indicate your opinion about each of the questions below by marking any one of the nine responses in the columns on the right side, ranging from (1) "None at all" to (9) "A Great Deal" as each represents a degree on the continuum.

Please respond to each of the questions by considering the combination of your current ability, resources, and opportunity to do each of the following in your present position.

	None at all		Very Little		Some Degree		Quite A Bit		A Great Deal
1. How much can you do to control disruptive behavior in the classroom?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2. How much can you do to motivate students who show low interest in school work?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3. How much can you do to calm a student who is disruptive or noisy?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
4. How much can you do to help your students value learning?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5. To what extent can you craft good questions for your students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6. How much can you do to get children to follow classroom rules?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
7. How much can you do to get students to believe they can do well in school work?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
8. How well can you establish a classroom management system with each group of students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
9. To what extent can you use a variety of assessment strategies?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
10. To what extent can you provide an alternative explanation or example when students are confused?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
11. How much can you assist families in helping their children do well in school?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
12. How well can you implement alternative teaching strategies in your classroom?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

How confident are you in your understanding of learner-centered education and the district vision? Please explain:

How confident are you in your ability to use learner-centered practices in your classroom? Please explain:

Appendix G

Semi-Structured Focus Group Guiding Questions

1. How, if at all, did participation in this professional learning change your belief in your ability to use learner-centered practices in your classroom?
2. How, if at all, did participation in this professional learning change your understanding of learner-centered education in general?
3. How, if at all, did participation in this professional learning experience change your approach to experimenting with learner-centered innovations in your classroom?
4. What if anything, can you take with you from this experience and apply in your role as a teacher?
5. If a similar PL experience is used in the future, is there anything about the experience you would like to add, change, or remove?
6. What else, if anything, do you think is important for me (the researcher) to know about your experience with this professional learning?

Appendix H

Completed Resource Availability Checklist

Session 1		
Resource	Available?	Notes
Classroom Coverage for Each Participant	Mostly	Coverage for participants was acquired by the middle school's main office after 1st Period ended, meaning the study activities began at 8:30am.
Meeting Space for PLC	Mostly	The study session started in the library. Later in the day, the session continued in a vacant classroom to accommodate activities happening in the library at that time. Though space was available the entire day, the shift in location might have impacted the work flow of the session.
Individual Work Space for each Participant	Mostly	Due to limited space, participants worked independently in the library in the morning and vacant classroom in the afternoon.
Instructional Materials for Session	Yes	All planned instructional materials were created and available for this session.

Session 2		
Resource	Available?	Notes
Classroom Coverage for Each Participant	Mostly	I adjusted the start time of this session to 8:30am to avoid the issues that occurred in the first session regarding coverage. Coverage issues almost prevented this session from occurring at all.
Meeting Space for PLC	Yes	This session took place in the vacant classroom used in the second half of the first study session.
Individual Work Space for each Participant	Mostly	Due to limited space, participants worked independently in the library in the morning and vacant classroom in the afternoon.
Instructional Materials for Session	Yes	All planned instructional materials were created and available for this session.

Session 3		
Resource	Available?	Notes
Classroom Coverage for Each Participant	Mostly	I adjusted the start time of this session to 8:30am to avoid the issues that occurred in the first session regarding coverage.
Meeting Space for PLC	Yes	Same vacant classroom
Individual Work Space for each Participant	Mostly	Due to limited space, participants worked independently in the library in the morning and vacant classroom in the afternoon.
Instructional Materials for Session	Yes	All planned instructional materials were created and available for this session.

Session 4		
Resource	Available?	Notes
Classroom Coverage for Each Participant	Mostly	I adjusted the start time of this session to 8:30am to avoid the issues that occurred in the first session regarding coverage.
Meeting Space for PLC	Yes	Same vacant classroom
Individual Work Space for each Participant	Mostly	Due to limited space, participants worked independently in the library in the morning and vacant classroom in the afternoon.
Instructional Materials for Session	Yes	All planned instructional materials were created and available for this session.

Appendix I

Coding Table for Outcome Evaluation Questionnaire

Data Source	Codes	Samples	Themes
Pretest	Uncertainty regarding best practices	“There are days that I think I know [about the district vision and learner-centered education], but then something happens to make me feel less confident about if what I am doing aligns to our vision.”	Somewhat confident about LCE and the district vision, but uncertain about best practices
	"Somewhat confident" in understanding	“I am somewhat confident in my understanding of learner-centered education and the district vision.”	
Posttest	Importance of learner agency	“I think that considering how my students can help drive their learning experiences is an important piece of making sure it is learner-centered.”	Increased confidence in their understanding and greater consideration of key elements of LCE
	"More confident" in understanding of district vision	“I feel a lot more confident that I understand learner-centered education and the district vision now that I have participated in this study.”	

Appendix J

Coding Table for Focus Group Transcript

Codes	Samples	Themes
Increased confidence in operationalization abilities	“Participating in this has made me more confident in my ability to use learner centered practices.”	Growing belief in abilities to operationalize LCE and affect positive change (self-efficacy)
Increased confidence in ability to affect positive change	“I do really think that if you stick to trying to help facilitate some of these skills you will get to the endpoint that you're hoping for.”	
Deeper understanding	“There’s so much to [the district vision and LCE]. It’s very complex...but I feel like after doing this, I just have a deeper understanding of it, a better idea of what each little piece of learner-centered education can really look like.”	Development of deeper understandings of LCE and its operationalization (sensemaking)
Considerations of operationalization	“This made me realize that there are a lot of ways that you can do this, there are a lot of things that you can do and can implement.”	
New perspective	“...having a different mindset and looking at things a bit differently, being intentional about [developing each student] more as a whole person.”	Emergence of a paradigm shift (sensemaking)
Importance of LCE	“So if we can really implement those activities, that benefits the classroom community as a whole.”	
Reflections on inhibitive thought patterns	“Maybe that's the easy way out, saying [things] like, 'Oh, yeah, I get it, like I understand.’”	
Feelings of fulfillment through participation	“I feel like I really did get something out of it, and that doesn’t happen all the time. I feel like all the activities were meaningful. Nothing was unnecessary or extra.”	Identification of value in the PL experience (participant responsiveness)
Limited time	“ I wish we had more time.”	Time as the primary limiting factor (resource availability)
Importance of collaborative PL	“It [was] really helpful [to have] each other to bounce ideas off of.”	The importance of matching PL experiences to teachers' needs and best practices (other topics)
Importance of discussing existing perspectives on LCE	“I thought it was really helpful, where we worked through all of those pieces, especially starting out to make sure we're on the same page and talk about where we understand things or challenge ideas.”	

Importance of support/guidance	“Part of why this was so successful too and was so valuable was because [the PL facilitator] was a leader in talking about learner-centered innovation, because [the SWS] is something [the facilitator] has been doing.”	
Importance of time	“I feel like [the PL experience] really gave us the time to dive deeper and to do that planning.”	
Overall reflections on PL experience	“It was really nice to attend a PD and work with a facilitator who is calm and not like, ‘we need to do all these things.’”	
Reflections on observations	“I think [the SWS] is such a good example of learner-centered education that the observations were helpful and helped us have really productive conversation.”	
Supportive technology	“I think [ThingLink] enhanced it. I feel like it was a good concise way [to organize our thoughts].”	Potential for supporting technologies to enhance professional learning (other topics)
Future plans	“Although I didn’t have time to implement...that is something that I 100% plan to use for next [school] year.”	Plans to continue developing and using learner-centered innovations (other topics)

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EDUCATION

Ed.D. in Mind, Brain, and Teaching, August 2022

Johns Hopkins University

M.A. in Education, 2014

Villanova University

B.A. in English and American Studies, 2012

Ursinus College

EXPERIENCE

Director of Education – *Center School; Abington, PA; July 2022 – Present*

- Coordinate the Educator Induction and Act 48 Professional Development programs.
- Manage and visualize student growth data and aggregate statistics using AirTable and Google Sheets.
- Develop and implement the social-emotional support and restorative justice behavioral response plans.
- Oversee piloting of competency-based instruction, assessment, and growth reporting in middle grades math.
- Interview and hire teachers and instructional assistants.
- Manage 13 budgets under the umbrella of instructional practices, including service subscriptions and professional development.
- Create the master schedule for teachers and students.
- Lead semi-weekly faculty meetings to support teacher development and communicate key operational details.

Education Writer – *www.education-reimagined.org, www.joshecker.com; April 2014 – Present*

- Author long form articles, two of which were in Education Reimagined's list of Top 10 most viewed articles in their respective publication years.
- Appear as a guest on various education podcasts that reach a national audience.

English and Social Studies Teacher – [REDACTED] Middle School; [REDACTED], PA; Aug. 2017 – June 2022

- Designed and managed a learner-centered, technology-enhanced education program focused on cultivating development of 21st century skills, knowledge, and dispositions for 70 students and diffusing innovative teaching practices across the school district.
- Facilitated professional learning experiences for teaching colleagues through classroom observations, collaborative discussion, and professional development seminars.
- Supported learners in the middle school gifted program to accelerate and enrich their learning in accordance with their Gifted Individual Education Plans to meet state policy mandates.
- Built an online curriculum for grades 6-8 in the subjects of science, math, English, and social studies using Canvas LMS and Google Workspace apps.
- Supervised the middle school Pennsylvania Junior Academy of Science (PJAS) program and technology club, helping learners develop, conduct, and analyze science experiments and STEM projects.

Graduate Teaching Assistant – Johns Hopkins University; Baltimore, MD; June 2021 – December 2021

- Collaborated remotely with a different professor each semester teaching online doctoral classes, including sections of Mind, Brain Science, & Learning and Disciplinary Approaches to Education.
- Supported 10-15 doctoral students each semester through individual and group discussion to maximize learning and engagement.
- Lead online group discussion with the course professor and students to engage learners in transformative dialogue.
- Designed a student engagement tracker in Google Sheets that utilizes conditional formatting and other functions and has since been adopted by another graduate teaching assistant.
- Created a diagram of learning theories that is now included as part of the curriculum for the course titled Multiple Perspectives on Learning and Teaching.

Pre-Service Teacher Mentor – Multiple Locations; May 2016 – June 2022

- Used demonstration lessons as opportunities to discuss teaching and learning with a pre-service Social Studies teacher at Muhlenberg College in the fall 2021 semester.
- Served remotely as a one-on-one mentor for a pre-service English teacher at Villanova University during the fall 2020 semester.

Student Advisory Board Member – *Johns Hopkins University; Baltimore, MD; Aug. 2020 – Aug. 2021*

- Communicated remotely with program faculty to ensure the Doctor of Education program continued meeting the needs of approximately 75 doctoral students.
- Collaborated with Ed.D. colleagues through online, synchronous discussions to identify and address student issues such as time management, stress, and equitable access and support.

English Teacher – *Tacony Academy Charter High School; Philadelphia, PA; Aug. 2014 – June 2017*

- Provided inquiry- and literacy-based differentiated instruction for a culturally diverse and economically disadvantaged student body.
 - Sponsored and designed the school blog, yearbook, and literary magazine.
 - Coached Girls Varsity Basketball as an assistant to the head coach.
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SELECTED PUBLICATIONS, INTERVIEWS, AND PRESENTATIONS

Publications

- [The Stories Learners Tell Themselves \(and How We Can Shape Them\)](#) (Empower the Learner; March, 2022)
- [6 Strategies to Support the Development of Self-Directed Learners](#) (Education Reimagined; January, 2020)

Interviews

- [Shift Your Paradigm Podcast, Episode 54](#) (December, 2019)

Presentations

- “[REDACTED]: A Personalized Approach to Student Learning” - Greater Lehigh Valley Consortium for Excellence and Equity (Bethlehem, PA; April, 2019)