“It’s the People That Drive It”: Motivating and Supporting Collaborative Data Use Practices in Three Teacher Education Programs

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Abstract

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A proliferation of both state and federal accountability mandates encourage or require outcomes-based evaluation and evidence of data-informed program improvement in teacher education programs. Teacher educators are increasingly pressured to respond to these mandates with new assessments, data sources, data platforms and tools, data analysis activities, and data-driven program changes. However, little is known about how programs are responding to increased accountability and data use policies in ways that foster broadened stakeholder engagement in data use practices and decision making. This dissertation attempts to fill this gap by looking more directly at the nature and role of faculty, supervisor, and administrator engagement in collaborative data use in the context of teacher education. In addition, this study

examines the organizational, cultural, and interpersonal resources that support or hinder broadened engagement in collaborative data use practices.

Using a theoretical framework that integrates cultural-historical activity theory (CHAT) and sociocultural perspectives on workplace learning, this qualitative multiple case study investigates how three teacher education programs situated in different institutional and geographic contexts shifted organizational structures, resources, norms, and social supports to encourage collaborative data use practices aimed primarily at program improvement. These three programs built commitment to and capacity for evidence-based program improvement in the face of significant tensions between increased accountability policies and organizational and faculty autonomy.

Findings from this study indicate that in these three teacher education programs, motivating and supporting increased program member engagement in collective organizational goals and practices required developing interpersonal practices that helped align individual motives and goals with a collaboratively constructed collective agenda. These interpersonal *bridging practices* worked to bridge individual and collective motives, agency, knowledge, expertise, and responsibility. These practices supported the development of emerging cultural resources that fostered co-constructed collective motives, collective agency, common knowledge, distributed expertise, and a sense of shared responsibility. The process of developing capacity and support for broadened collaborative engagement in data use practices required simultaneous attention to organizational, cultural, and interpersonal resources to facilitate goal-oriented organizational change.

Understanding how teacher education practitioners make sense of various types of data in their work, and learn in individual and programmatic ways through the process, is particularly

important and timely given fast-moving teacher education accountability policy changes that have resulted in a surge of program data and outcomes-based requirements. This research contributes not only to the field of teacher education, but also to work on organizational learning and change, particularly within the CHAT tradition. Scholars in organizational learning, including those coming from a CHAT perspective, tend to prioritize the role of institutional structures and tools while underemphasizing the role of individual motivation, expertise, and agency in change processes. This research bridges structural and system-focused accounts of organizational learning with sociocultural, participation-based accounts of workplace learning in order to better understand the complex relationships among motivation, agency, and capacity in organizational change.

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DEDICATION

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Chapter 1: Introduction

A proliferation of both state and federal accountability mandates encourage or require outcomes-based evaluation and evidence-based program improvement in teacher education (Cochran-Smith, 2005a, 2005b; Wineburg, 2006). Teacher education programs (TEPs) are increasingly pressured to respond to these mandates with new assessments, data sources, data platforms and tools, data analysis activities, and data-driven program changes. However, little is known about how TEPs are responding to increased accountability and data use policies.

Education researchers and practitioners are just beginning to develop a theoretical and empirical knowledge base about the practice of data use and the conditions under which evidence-based decision making practices occur (Moss, 2007). While the majority of this new scholarship has taken place in P-12 contexts, this investigation aims to better understand data use practices and routines in teacher education, which has substantively different organizational structures, policies, and norms. Understanding how teacher education practitioners make sense of various types of data in their work, and learn in individual and programmatic ways through the process, is particularly important and timely given fast-moving teacher education accountability policy changes that have resulted in a surge of program data and outcomes-based requirements.

Existing empirical evidence from both the P-12 and teacher education data use literatures suggests that distributed engagement and collaboration among many program participants is key to developing and sustaining data use practices that have the potential to foster individual and organizational learning (e.g., Anderson, Leithwood, & Strauss, 2010; Bunch, Aguirre, & Téllez, 2009; Peck, Gallucci, & Sloan, 2010; Peck & McDonald, 2013; Wayman & Stringfield, 2006). These literatures also emphasize how individual participants' motivations, experiences, beliefs,

values, and goals matter in creating and sustaining data use practices that engage a variety of program participants in authentic ways (Coburn, 2001, 2010; Coburn, Toure, & Yamashita, 2009; Coburn & Turner, 2011; Spillane & Miele, 2007; Young & Kim, 2010). The data use literatures from both the P-12 and teacher education contexts illuminate two main findings related to motivating stakeholder engagement in data use: (1) the value of using data for programmatic inquiry related to local values and goals (Cochran-Smith & Boston College Evidence Team, 2009; Copland, 2003; Peck et al., 2010; Peck, Gallucci, Sloan, & Lippincott, 2009; Peck & McDonald, 2013, 2014; Sloan, 2013; Stillman et al., 2013); and (2) providing programmatic supports for collaborative stakeholder engagement in data use practices (Knapp, Copland, & Swinnerton, 2007; Means, Padilla, & Gallagher, 2010; Peck et al., 2010, 2009; Peck & McDonald, 2013, 2014; Sloan, 2013; Wayman, 2005; Wayman & Cho, 2009; Wayman & Stringfield, 2006; Wohlstetter, Datnow, & Park, 2008). Both literatures also highlight, but offer relatively limited analysis of, the motivational aspects of teachers' or faculty members' participation in data use practices (Coburn, 2010; Peck et al., 2010, 2009; Peck, Singer-Gabella, Sloan, & Lin, 2014; Peck & McDonald, 2013, 2014; Rennert-Ariev, 2008).

This study aims to enrich our understanding of why and how individuals participate in the process of collaborative, inquiry-oriented data use in three "high data use" teacher education programs situated in different institutional and policy contexts. Understanding the nature and role of faculty, supervisor, and administrator engagement and collaboration in data use is critical for building knowledge about how teacher education programs can leverage both external and internal accountability goals, as well as assess program progress and effectiveness. Since motivational and relational dynamics are rarely in the foreground of studies of data use, we know little about how teacher education programs might successfully foster productive stakeholder

engagement—rather than resistance—in data use. This study begins to fill this gap by looking more directly at why and faculty members, supervisors, and program leaders engage in collaborative data use practices, as well as what organizational, cultural, and interpersonal resources support or hinder that engagement. This investigation aims to illuminate both challenges and opportunities related to using evidence for program improvement in teacher education.

Organization of Dissertation

This dissertation is organized into the following eight chapters. In Chapter 2, I present a literature review of existing scholarship on the accountability context for teacher education, data use practices in P-12 contexts, and data use practices in teacher education. I articulate a rationale for the study, and use the literature to come to a set of research questions. In Chapter 3, I describe my study design and methodology, including data collection and analysis strategies. In Chapter 4, I describe my theoretical framework, including the theoretical perspectives and concepts that informed my study design and analysis.

In chapters 5, 6, and 7, I present my analytic findings. Chapter 5 describes the context and history of each of the three teacher education programs included in this study. Using a CHAT framework necessitated the examination of each teacher education program's activity system, as well as how the unique cultural and historical development of each program informed their data-related policies and practices. In addition, I discuss the collaborative data use practices at each program and factors that fostered or constrained broadened stakeholder engagement.

In Chapter 6, I describe my findings related to the role of contradictions in the expansive learning processes at each of the three sites. I draw on Engeström's (1987; Foot & Groleau, 2011) conception of four levels of contradictions and corresponding epistemic actions in

expansive learning. In doing so, I highlight the change processes at each of the three sites and the role of internal and external forces in shifting program structures, cultures, and practices related to data use.

In Chapter 7, I present my findings related to the role of *bridging practices* as interpersonal supports and resources for expansive learning processes. I highlight the role of five types of bridging practices: bridging individual and collective motives, bridging individual and collective agency, bridging individual and collective knowledge, bridging individual and collective expertise, and bridging individual and collective responsibility. I argue that these practices led to several cultural outcomes that also acted as resources for continued expansive learning.

Finally, in Chapter 8, I examine lessons from these three teacher education programs for motivating and supporting collaborative data use aimed at program improvement. I discuss the interrelated roles of organizational, cultural, and interpersonal resources and practices in organizational change and expansive learning. In addition, I consider implications of the study for teacher education and for studies of organizational change and expansive learning. I close with both limitations and contributions of the study.

Chapter 2: Literature Review

Accountability Context for Teacher Education

Teacher education programs (TEPs) in the United States are operating in a context of increasing accountability policies at both the state and federal level. These state and federal policies within the field of teacher education increasingly require outcomes-based evaluation, external accountability and oversight, and evidence of data-informed program improvement (Cochran-Smith, 2005a, 2005b; Wineburg, 2006). New and intensified standards for evidence-based accountability and program improvement are now also embedded in national standards for teacher education program accreditation and state program review and approval processes. For example, the Council for the Accreditation of Educator Preparation (CAEP), the sole accrediting body for teacher education as of July 2013, embraces the rhetoric of evidence-based decision making and continuous improvement at the organizational level in its two primary guiding principles, which are: (1) "Solid evidence that the provider's graduates are competent and caring educators", and (2) "There must be solid evidence that the provider's educator staff have the capacity to create a culture of evidence and use it to maintain and enhance the quality of the professional programs they offer" (http://caepnet.org/standards/introduction). The CAEP standards that teacher education programs are held to include more detailed requirements related to strategic evaluation of programs' impact on P-12 student learning and continuous improvement at the organizational level.

Additionally, in December 2014 the Department of Education proposed new teacher preparation regulations under Title II of the Higher Education Act (HEA) of 1965 which would require states to hold TEPs accountable by creating a rating system for teacher preparation programs based on various data sources, including student growth data, employment outcomes,

survey outcomes, and accreditation status (www.federalregister.gov/articles/2014/12/03/2014-28218/teacher-preparation-issues). Under this proposed rule, only programs with high ratings would be eligible to participate in the federal student financial aid program known as TEACH grants. Though currently every state has a different accountability system for teacher preparation, this proposed policy mandate highlights increased pressure for publicly available data on program efficacy and a common set of standards for what teachers need to learn and what programs must provide.

Given the shifting policy context and the variance in state accountability systems for teacher preparation, the data sources available to TEPs differ tremendously between states, districts, and even programs. Over 1,100 teacher tests exist or are in use, and pass rates differ considerably across states (Crowe, 2010; Wilson, 2014). The quality of available assessments and data, and the perceived usefulness of those assessments and data for different stakeholders, also varies. Programs begin receiving data on candidates before program entry, and continue to gather data through program completion and beyond. At entry many states have increased program requirements; for example, 29 states required tests of academic proficiency prior to entry in 2013 (Greenberg, Walsh, & McKee, 2015). By program completion, TEPs are increasingly adopting performance assessments such as the edTPA, a portfolio-based multiple measure preservice assessment system developed collaboratively between Stanford University and the American Association of Colleges for Teacher Education (AACTE). Currently 698 Educator Preparation Programs in 38 states and the District of Columbia use edTPA (http://edtpa.aacte.org/state-policy). EdTPA is now an approved assessment in 15 states that have policies requiring a state-approved performance assessment for candidate licensure, and several other states are considering requiring edTPA or taking steps towards statewide

implementation. Beyond graduation, an increasing number of states, including Louisiana, Florida, and Texas, have implemented value-added measure policies and are using P-12 student achievement data linked to classroom teachers' preparation program in their teacher preparation accountability systems. Several other states with Race to the Top funding have plans to implement value-added measures.

Despite a negative rhetorical climate and chronic scarcity of fiscal resources, TEPs are increasingly pressured to respond to these accountability standards and mandates with new assessments, data platforms and tools, data analysis activities, and data-driven program changes. Like their P-12 organizational counterparts expected to make "adequate yearly progress", TEPs are expected to continuously improve their programs by using evidence to assess their current status, identify challenges, and improve program outcomes (Cochran-Smith, 2005b; Peck & McDonald, 2014; Wilson, 2014). While a variety of types of evidence have long been used in teacher education, accountability policies increasingly stress formally and systematically collected evidence, preferably with objective standards for evaluating performance progress and outcomes, as well as estimates of reliability and validity.

Rationale for Study

Despite the upsurge in policies and mandates promoting evidence-based accountability and expectations for continuous program improvement in both P-12 and teacher education, education researchers and practitioners are just beginning to develop a theoretical and empirical knowledge base about the practice of data use and the conditions under which evidence-based decision making practices occur (Moss, 2007). There is now a substantial literature about P-12 policy outcomes and policy implementation related to current accountability policies, but less is known about the actual practices and routines that educators and administrators use in carrying

out data collection, analysis, and data-driven decision making about program improvement. To better understand these practices, researchers must attend to how individuals and groups handle data within their social and organizational contexts, as "data by themselves are not evidence of anything, until users of the data bring concepts, criteria, theories of action, and interpretive frames of reference to the task of making sense of the data" (Knapp, Copland, & Swinnerton, 2007, p. 80). Thus data use requires interpretation, analysis, and judgment in the process of transforming information in various forms into actionable knowledge.

This investigation aims to better understand data use practices and routines in the context of teacher education. Understanding how practitioners and organizations make sense of various types of data in their work, and learn in individual and programmatic ways through the process, is particularly important and timely given fast-moving changes to the teacher education accountability landscape that have resulted in a surge of program data and data use requirements for many programs. In the next few sections I examine what we know about data use practices in both P-12 and teacher education contexts in order to come to a set of researchable questions that will help improve our understanding of data use practices and processes in teacher education.

Data Use Practices in P-12 Contexts

Data-based decision making has long been one of the most prominent strategies for educational improvement in the P-12 sphere, though it is only recently that researchers have begun attending to what that means in terms of educators' data use practices (Coburn & Turner, 2012; Moss, 2007). In this section I review what the P-12 literature has revealed about the individual, interpersonal, organizational, and contextual factors affecting data use, as well as what types of data use activities have been found to be most useful to educators.

Individual and interpersonal factors affecting data use practices. Research in the P-12 field has revealed that just because data is available does not mean it will be used (Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006; Mandinach, 2012). In order to become information that can inform action, data must be collected, organized, analyzed, and applied to practice. Coburn and colleagues (Coburn, 2001; Coburn, Toure, & Yamashita, 2009; Coburn & Turner, 2011) argue that data use is an interpretive process that involves individuals or groups noticing data, creating meaning from it, and constructing implications for action. These interpretive processes are influenced by individual beliefs and knowledge. For example, people often attend primarily to data that supports their personal beliefs and ignore or discount evidence that might contradict or challenge their beliefs (Bickel & Cooley, 1985; Coburn & Talbert, 2006; Ingram, Louis, & Schroeder, 2004; Young & Kim, 2010). Once people are engaged in making sense of the data, preexisting beliefs and cognitive frameworks mediate the way information is organized and interpreted (Spillane & Miele, 2007). People with different beliefs may interpret the same evidence in contradictory ways (Coburn, 2001; Coburn et al., 2009). Thus personal beliefs, knowledge, assumptions, and experiences guide processes of interpretation, argumentation, and persuasion that ultimately influence how data is used to frame problems and potential solutions (Coburn et al., 2009).

There's also evidence that data use itself won't necessarily lead to improved learning. For example, teachers and administrators may not have the knowledge and skills to use data to ask questions, frame problems, find appropriate data, and identify potential solutions based on the data (Kerr et al., 2006; Means, Padilla, & Gallagher, 2010; Olah et al., 2010). Different policy actors may try to influence decisions based on their own preferences, making evidence use more symbolic than instrumental (Coburn et al., 2009).

These individual factors are connected to cultural and structural aspects of data use; for example, educators require agency and authority in order to collect, analyze, and act on data. Several studies found that teachers lacked the authority to make curricular or pedagogical changes based on data analysis activities (Huffman & Kalnin, 2003; Kerr et al., 2006; Means et al., 2010; Wohlstetter et al., 2008). These studies suggest that structures and norms facilitating educators' agency and authority are necessary to support educators' individual or collective engagement in data analysis, decision making, and action.

The role of collaboration. Given that data use practices usually happen in an interactive context with colleagues (Anderson et al., 2010; Spillane, 2012), the preexisting beliefs, knowledge, and motivations that each individual brings to the table shape how they respond to data-related reforms (Coburn, 2010; Honig & Ikemoto, 2008; Kerr et al., 2006). Depending on these individual factors, people can notice and interpret data in contrasting ways (Coburn, 2001; Coburn et al., 2009; Spillane, 2012). Coburn and colleagues (2009) found that when individuals collaborate across departments or roles, they are more likely to come to conflicting interpretations of data and appropriate responses than when individuals interact within their departments or roles. This is not necessarily problematic; another study found that working in small group settings facilitated more sound data interpretations when colleagues helped clarify and correct analysis errors (Means et al., 2010).

Several studies have suggested benefits from cross-role collaboration in data use activities. Nelson and Slavit (2007) found that middle and high school math and science teachers engaged in collective examination of student data through a professional development initiative "identified challenges in working across grade levels and disciplines, but also spoke of great benefits in this collaboration" (p. 36). Teachers and other school personnel participating in a

data-based collaborative inquiry project in Minnesota also reported appreciating cross-site and cross-disciplinary (math and science) opportunities for collaborative inquiry (Huffman & Kalnin, 2003). Another study found that vertical collaboration both between district-level administrators and principals and between principals and teachers played a key role in facilitating data use (Anderson et al., 2010). Coburn and colleagues (2009) suggested that substantive "cross-divisional engagement is likely necessary to develop sets of understandings about instructional issues that are truly shared and that, in turn, can facilitate joint definitions of problems and shared visions of solutions" (p. 1146).

Collaboration has been shown to both facilitate effective and inquiry-oriented data use, and also be a positive outcome of data use initiatives in schools (Chen et al., 2005; Lachat & Smith, 2005; Massell, 2001; Murphy, 2002; Wayman, 2005; Young, 2006). For example, Lachat and Smith (2005) found that collaborative data use organized around a clear set of questions helped build staff skills, encourage increased data use amongst staff, and keep the focus on student learning and achievement. Leadership played a key role in promoting widespread, collaborative, inquiry-oriented data use practices. They asserted:

> [School leaders'] modeling of the use of questions to focus the collaborative examination of data is a key factor in reinforcing this approach to schoolwide data use. Focusing on a set of key student performance questions not only builds staff skills to analyze data, but also increases their motivation to use the data. (2005, p. 343)

This study, and others, suggests that distributing engagement among a variety of stakeholders, most notably teachers in the K-12 context, appears to matter to the success of interventions promoting data use. Anderson and colleagues (2010) found that schools that relied on external expertise to support data use work exhibited lower levels of data use, while schools

with higher levels of data use had widely distributed internal expertise. A few studies have suggested that the most effective data use practices involve all teachers on a faculty (Wayman, 2005; Wayman et al., 2004; Wayman & Stringfield, 2006). In one study of three schools engaging in exemplary use of student data (including widespread faculty engagement), principals reported that encouraging teachers to work in groups reduced initial resistance to the data use initiative (Wayman & Stringfield, 2006). In this study teachers and principals reported new opportunities for collaboration and new forms of collaboration, including bringing together staff who previously did not collaborate, as well as facilitating collaboration that was more academic and professional than before. As a result, teachers in all three schools spoke of developing a common language of practice, a phenomenon that other researchers in both K-12 and teacher education contexts have noted (Murphy, 2002; Peck et al., 2010; Peck, Gallucci, Sloan, & Lippincott, 2009; Supovitz & Klein, 2003; Young, 2006). Conversely, in two district-level studies, central office divisions and "silos" limited opportunities to develop shared understandings around data and impeded reform efforts (Coburn, 2010; Moody & Dede, 2008).

Organizational influences on data use practices. In this section I review findings related to organizational influences on data use practices from research in P-12 settings.

Organizational structures and resources. Several studies of system-level data use interventions found that teachers rarely used promoted data use practices consistently or systematically (Jaquith & McLaughlin, 2009; Kerr et al., 2006; Moody & Dede, 2008). Some studies found that the level of support received at an interpersonal and organizational level correlated with how frequently people engaged in data use practices (Anderson et al., 2010; Kerr et al., 2006) and the quality of those practices (Coburn et al., 2009). Coburn and colleagues (2009) found that as resources supporting data use—such as time, personnel, and external

support—decreased, conceptual use of research also decreased, symbolic use of evidence increased, and it was less likely that district personnel's use of evidence enabled shared understandings.

Several researchers have recommended the use of collaborative structures to support educators' joint data use work (e.g., Datnow et al., 2007; Knapp et al., 2007; Means et al., 2010; Park & Wohlstetter, 2007; Supovitz, 2006). Datnow and colleagues, for example, found that high data use schools and districts built capacity for data use at the school level by creating structured time and opportunities for collaboration both within schools and across schools. In a study of 36 high-data-use case study schools, 30 prioritized regular time to examine data through structures such as weekly team or department meetings (Means et al., 2010). Other studies have also emphasized the need to allow educators adequate time to examine data, or conversely identified lack of time as a barrier to data use (e.g., Coburn, 2010; Ingram et al., 2004; Lachat & Smith, 2005; Marsh et al., 2010; Means et al., 2010; Wayman & Stringfield, 2006).

Data systems are also cited as important resources for individual and collaborative data use, particularly when they are equipped to provide data access in accurate, timely, and user-friendly ways (Wayman & Cho, 2009; Wayman et al., 2004; Wayman & Stringfield, 2006). Full access to program data has been found to facilitate greater teacher data use (Wayman & Stringfield, 2006). While data systems can help facilitate effective data use, alone they are not sufficient; clearly other individual, interpersonal, and organizational factors are necessary for widespread and effective data use within organizations (Wayman & Cho, 2009).

Organizational culture and leadership. The literature on data use in P-12 educational settings and systems also indicates that organizational culture and leadership play important roles in effective data use. For example, Katz and his colleagues (Katz, Sutherland, & Earl, 2002,

2005) suggested the importance of an "evaluation habit of mind" within schools. Their conception of an evaluation-minded culture involved data-driven, goal-related inquiry aimed at organizational improvement, as well as systematic reflection and planning.

Firestone and González (2007) contrasted "accountability" cultures (which are reactive and driven primarily by the need to raise test scores) and "organizational learning" cultures (which are more proactive and use data such as test scores in attempts to improve student learning). They suggested that organizational learning cultures "combine professional community with centralized leadership in a more distributed leadership pattern" (2007, p. 145). They argued that the context for data use for educational improvement has three major aspects: a goal focus, using data to diagnose the problem; a social context in which there is a sense of professional community and trust; and the building of an efficient infrastructure for data management and use.

Leadership plays a key role in developing and sustaining data-driven organizational cultures. Several studies found that school leaders who were knowledgeable about and committed to data use and who built a strong vision for data use in their schools were able to use data for inquiry and decision making at an organizational level (Choppin, 2002; Feldman & Tung, 2001; Herman & Gribbons, 2001; Ikemoto & Marsh, 2007; Lachat & Smith, 2005; Mason, 2002; Mieles & Foley, 2005). For example, in their analysis of two studies of district and school leaders in ten districts in four states, Ikemoto and Marsh (2007) found that administrators who both held strong visions related to data-driven decision making and promoted collaboration enabled data use. They also found that organizational cultures that promoted norms of interpersonal trust and viewed accountability as helpful rather than threatening enabled complex data-driven decision making. Similarly, other studies have found that effective leaders frame

data use as a nonthreatening and beneficial tool for organizational and instructional improvement (Choppin, 2002; Lachat, 2001; Wayman & Stringfield, 2006).

Other studies have suggested that distributed leadership patterns support effective data use. Copland (2003) found that new, more distributed leadership structures were associated with the development of a school culture that supported data use through "cycles of inquiry". Knapp, Copland, and Swinnerton (2007) described how a culture of inquiry emerged when school leaders and educators participated in cycles of data-informed inquiry. They found that while data-oriented leadership often motivates initial data use, an organizational culture oriented to cycles of inquiry develops slowly and through repeated activity by many participants in the system.

Researchers have found that maintaining data use practices over time is very difficult (Ancess, Barnett, & Allen, 2007; Park & Datnow, 2009). Staff turnover (particularly of program leaders) has been cited as a challenge for continued data-based inquiry processes (Copland, 2003; Jaquith & McLaughlin, 2009; Marsh et al., 2008). Distributed leadership structures and patterns may support data use sustainability. Some studies found that committed, visionary school leaders facilitated initial data use initiatives and practices, then worked to create more distributed leadership around data use (Copland, 2003; Wayman & Stringfield, 2006). Copland (2003) found that some schools were able to continue data-related practices despite leadership turnover by distributing the work and hiring personnel who shared their data and inquiry-related values and practices.

Inquiry orientation. Previous research on data use in P-12 educational contexts highlights the importance of an inquiry orientation to data use as a means of continuous improvement and organizational learning (Copland, 2003; Feldman & Tung, 2001). For

example, Feldman and Tung (2001) found that the inquiry process led to improved student achievement as well as a professional culture in which teachers became more reflective and modeled the kinds of behavior they wanted students to practice. Knapp and colleagues (2007) argued for the development of an organizational *culture of inquiry* in which leaders and other personnel participate in cycles of data-informed inquiry. Scholars in teacher education (e.g., Cochran-Smith & the Boston College Evidence Team, 2009; Peck & McDonald, 2014) have also argued for the development of data-informed cultures of inquiry in teacher education programs, which I return to in the next section.

Ikemoto and Marsh (2007), drawing on interview and documentary data from two studies that took place in ten districts across four states, analyzed instances of data-driven decision making to highlight different types of decision making practices and the conditions influencing data use in schools. They identified four models of data use that varied in terms of the relative complexity of the types of data used (e.g., number of data sources, level of detail, data from one point in time versus trend data) and the relative complexity of data analysis and decision making (e.g., use of internal or external expertise in data interpretation, level of participation in data use activities, and frequency of data use activities). Their *basic* model of data-driven decision making uses simple data and simple analysis and decision making; the *analysis-focused* model uses simple data and complex decision making; the *data-focused* model uses complex types of data and simple analysis and decision making; and the *inquiry-focused* model uses complex types of data and complex analysis and decision making.

In Ikemoto and Marsh's (2007) sample of 36 instances of data-driven decision making, only five examples were inquiry-focused, while nearly half (15) of those examples represented their most basic model of data-driven decision making. The inquiry-focused model is likely

relatively rare because it uses the most sophisticated data analysis and interpretation methods and requires the most significant time and resources. However, the usefulness of inquiry-focused data practices is supported by other research findings in the P-12 literature: for example, other researchers have found that data practices are most useful to educators when multiple forms of data are used (Choppin, 2002; Keeney, 1998; Mason, 2002; Supovitz & Klein, 2003) and when analysis practices are collaborative and iterative in nature (Choppin, 2002; Feldman & Tung, 2001; Ingram et al., 2004; Lachat, 2001; Lachat & Smith, 2005).

While different types of data use activities are appropriate for different purposes, there is evidence that the ability to engage in and support complex, inquiry-oriented data use activities is particularly important for organizational learning and program improvement (Copland, 2003; Knapp et al., 2007; Ikemoto & Marsh, 2007). Furthermore, since the type of data use practices described in Ikemoto and Marsh's inquiry-focused model are the most complex and require the most resources (such as staff capacity and support, time, access to expertise, and tools), presumably organizations with the capacity and expertise to engage in inquiry-focused data use could also employ simpler forms of data analysis for specific purposes where "less may be more" (Celio & Harvey, 2005, p. 71). Given that the literature supports the argument that inquiry-oriented data use practices are key for organizational learning and program improvement, the field would benefit from further understanding of the process of inquiry-oriented data use practices, the factors supporting or constraining them, as well as the relationship between inquiry-oriented data use practices and professional and organizational learning.

The findings on data use in the P-12 sphere provide helpful guidance for an exploration of data use in teacher education programs, though there are also some key differences in the

higher education context of most teacher education programs. In the next section I describe those differences and review the existing literature on data use and data-related policy implementation in teacher education.

Data Use Practices in Teacher Education

While understanding the findings in the P-12 data use literature is worthwhile given the related accountability pressures these educational organizations face, it's worth considering the crucial differences found in the context of higher education, and teacher education programs more specifically. Institutes of higher education have longstanding traditions of autonomy and academic freedom (Hamilton, 2002; Olivas, 1993), which are at odds with current accountability mandates that impose new standardized testing and program approval requirements (Alexander, 2000; Pullin, 2004). Since the mid-1980s, both the "massification" of higher education and limitations of public expenditures for higher education have served to increase public interest in higher education performance-based accountability (Alexander, 2000).

This trend has been particularly notable in teacher education, where there is an unprecedented level of public scrutiny, a negative rhetorical climate, and a rash of new federal and state-level accountability policies. Program compliance with state-mandated curriculum guidelines and accountability measures has also become increasingly important for program accreditation. Faculty are concerned that the current accountability context may lead higher education institutions to decrease faculty autonomy over curriculum content and instructional methods (Berlak, 2003; Kornfeld, Grady, Marker, & Ruddell, 2007; Pullin, 2004; Rennert-Ariev, 2008), an outcome demonstrated by the increase in court cases concerning how classes should be taught (Olivas, 1993).

A related concern is that this accountability context might undermine faculty motivations as a consequence of decreased autonomy. In the K-12 context, Rowan (1990) found that policy conditions that increase external control often undermine the motivation and commitment of teachers participating in implementation. Some studies in the teacher education context have suggested that current accountability mandates can cause programs and faculty to resist implementation, make superficial changes aimed at compliance, and possibly standardize their curriculum (Berlak, 2003; Kornfeld et al., 2007; Rennert-Ariev, 2008).

In a qualitative study focusing on the experience of three undergraduate elementary teacher candidates and their five-member faculty over two years, Rennert-Ariev (2008) analyzed how students and faculty experienced the implicit, "hidden" curriculum in a "performance-based" preservice teacher education program at a large comprehensive university, as well as how those implicit messages interacted with intended learning outcomes. The central hidden curricular message for faculty and students was that "superficial demonstrations of compliance with external mandates were more important than authentic intellectual engagement. Program participants frequently made the minimal possible effort to satisfy the requirements of what they saw as routine, bureaucratized tasks—not processing ostensible value" (p. 125). Students and faculty "resisted their own disempowerment by detaching themselves from these bureaucratic forms of accountability when they could" (pp. 125-126). Participants often engaged in what they termed "bureaucratic ventriloquism", or language that symbolized compliance with new standards without sincere intellectual engagement. One faculty member in the study articulated the phenomenon this way: "Sure, I can look at the standards and be able to say, oh yeah, I guess I do that in my class. But do they have a real role in how the class is shaped—no. It's just a mindless labeling process. I don't feel any ownership of them" (p. 126).

The new standards that resulted in bureaucratic ventriloquism were created in response to a statewide mandate that all undergraduate teacher education programs be performance-based in design and include performance-based assessments (Rennert-Ariev, 2008). At this university the performance-based standards and their corollary assessments were locally designed by university faculty. The standards and assessments were created primarily by a five-member faculty committee, and were revised several times based on individual faculty and focus group feedback. The study raised unanswered questions about why faculty felt so disempowered by the new performance standards and assessments, particularly given that they were locally developed by program faculty. One might hypothesize that if faculty felt a disempowering lack of ownership within this context of locally-developed program reform, then externally-developed standards, assessments, or other program requirements mandated through state or federal policies (such as the implementation of standardized performance assessments or value-added measures) would potentially be even more disempowering to faculty and students.

Indeed, Kornfeld, Grady, Marker, and Ruddell (2007) reported strong feelings of alienation and resistance amongst teacher education faculty members involved in the implementation of new state-level policies associated with California's Senate Bill 2042 (SB 2042), which resulted in new standards for teacher education programs and their teacher candidates. Notably, programs were required to demonstrate use of the new standards in their curriculum, and candidates were required to demonstrate their knowledge of 13 Teaching Performance Expectations (TPEs) on a Teaching Performance Assessment (TPA). Kornfeld and colleagues conducted a qualitative self-study of their teacher education program's "state-mandated compliance" with these standards and assessments. Faculty interviews early in the implementation process "revealed strong reactions of anger, resentment, and fear, as well as

feelings of helplessness and inadequacy" (Kornfeld et al., 2007, p. 1911). These feelings largely prevailed throughout the implementation process, and faculty most involved in the implementation expressed increased resistance to the new standards. Some faculty reported "minor improvements" (p. 1921) related to using the new standards over time, primarily in relation to their own course curricula, though "those directly involved in preparing the document for CCTC [California Commission on Teacher Credentialing] made a conscious effort not to let that process, and the resulting program, affect their teaching or the program that had been in place prior to adopting the new one" (p. 1921). The authors argued that the program was largely unaffected by the new policies, which they interpreted as maintaining autonomy over their program and successful avoidance of state control of their curriculum.

On the other hand, a well-documented qualitative self-study of another program's response to the same policies (related to SB 2042) described how program leadership at the University of California Santa Barbara's (UCSB) teacher education program responded to the policy changes in ways that affirmed local values and faculty agency (Peck et al., 2009, 2010; Sloan, 2013). Like faculty described in Kornfeld and colleagues' (2007) study, USCB program faculty initially felt disenfranchised by the new standards and the TPA policy, and were concerned that the new TPA (they used PACT) monopolized their curriculum and time and didn't reflect program values. However, despite initial negative feelings about the program changes, Peck and his colleagues documented how faculty attitudes shifted (becoming overwhelmingly positive) and new forms of engagement emerged as faculty were positioned to help collectively define the program's goals and curriculum, use PACT data to assess areas for program improvement, and develop and participate in program improvement efforts (Peck et al., 2010; Sloan, 2013).

The researchers argued that program leadership (including the program director, program coordinators, and faculty leaders) played a key role in shifting faculty attitudes and engagement. Designated program leaders helped manage the disturbances caused by the new policy by listening and responding to faculty dissent, organizing activities that facilitated faculty inquiry related to PACT, supporting a distributed model of leadership, and moving private work into the public sphere to foster collective learning (Peck et al., 2010; Sloan, 2013). Program leaders created time and space for conversations grounded in evidence (primarily PACT data) to take place by creating internal policies and structures that supported these conversations, such as the requirement that every program member help score PACT and participate in quarterly retreats where all program members engaged in PACT analysis activities. The program director also brought private work into a public space through purposeful use of program retreat time, which further facilitated cross-practice conversations (e.g., course instructors and supervisors) and new distributed leadership configurations (both formal and informal). Through these processes faculty and supervisors developed shared understandings of program values, curricula, and outcomes. Importantly, the researchers documented how over time supervisors became more involved in public conversations about the program than they were before PACT implementation, and eventually all program members' voices (including supervisors, part-time and adjunct instructors, etc.) became part of the ongoing collective reimagining of the program vision and curriculum (Peck et al., 2009, 2010; Sloan, 2013).

Another study of three "high data use" teacher education programs implementing PACT (Peck & McDonald, 2013) used a cultural-historical activity theory (CHAT) perspective to identify organizational practices associated with using PACT data for program improvement. Across the three programs, data use activities were positioned in purpose as inquiry-oriented

activities, rather than compliance with external policy mandates (Peck et al., 2010). Another finding consistent with the findings of the UCSB self-study was that "program leaders paid careful and strategic attention to affirming and maintaining the values and identity of their own programs" (Peck & McDonald, 2013, p. 27). Peck and McDonald (2013) argued that by affirming local program values and fostering inquiry-oriented data use activities, program leadership created the motivational context for increased faculty engagement (including tenure-line, adjunct, and field supervisors) in data use aimed at program evaluation and change. In a subsequent analysis of two of the "high data use" teacher education programs using PACT, Peck and McDonald (2014) used CHAT to analyze linkages between the abstract concept of a "culture of evidence" and concrete organizational practices in teacher education. They found that the two programs approached the creation of data use practices from an inquiry perspective, and concluded that the meaning of a "culture of evidence" depends on the motivations underlying its development (e.g., inquiry versus compliance).

Another study considering evidence-based program renewal and improvement efforts also emphasized the need to approach data-based decision making from an inquiry perspective and to collaboratively consider local program cultures, values, and goals in conjunction with external reporting requirements (Cochran-Smith & the Boston College Evidence Team, 2009). Cochran-Smith and her colleagues, in describing how the Boston College TEP attempted to build a "culture of evidence" and institutionalize evidence-based decision-making, emphasized that "one of the purposes of creating a culture of evidence and inquiry is to enhance the autonomy, responsibility, and creativity of those involved in teacher preparation" (p. 464). They created structures such as "data workshops" to systematize data use and "create a context in which data

could be jointly examined; interpreted; questioned; and connected to other evidence, ongoing experience, and the larger goals and commitments of the program" (pp. 464-465).

Some studies have also highlighted the role of assessments and data as tools that program participants can use towards program improvement goals. Several scholars have suggested that standardized teacher performance assessments (TPAs) have the potential to facilitate program improvement efforts (Darling-Hammond, 2010; Peck & McDonald, 2013; Peck et al., 2014; Sloan, 2013; Stillman et al., 2013). Standardized TPAs require candidates to produce records of performance from classroom teaching, from the planning phase (e.g., lesson plans) to the event itself (e.g., video records of teaching) to outcomes and evaluation of the event (e.g., samples of student work; written analysis and reflection). The holistic, authentic, concrete and contextualized nature of these records of actual classroom practice have particular affordances for candidate, faculty, and programmatic learning (Peck et al., 2010, 2014; Peck & McDonald, 2013).

At the candidate level, Chung's (2008) study of pre-service teacher candidates' participation in the Performance Assessment for California Teachers (PACT) found that candidates reported learning related to assessment of student learning, planning inter-disciplinary lesson units, and reflection of their teaching based on student learning outcomes. The concrete and contextualized nature of the data produced by TPAs also provide affordances for faculty and staff learning, especially when individual or group data analysis activities connect information from rich and concrete representations of practice to particular courses or field placements (Bunch et al., 2009; Peck et al., 2010; Peck & McDonald, 2013; Torgerson, Macy, Beare, & Tanner, 2009). In this way, learning from data analysis becomes potentially actionable at individual and programmatic levels.

Several studies of TPA implementation have noted increased collaboration and learning among faculty, field supervisors, and cooperating teachers (Bunch et al., 2009; Peck et al., 2010; Peck & McDonald, 2013; Ruesser, Butler, Symonds, Vetter, & Wall, 2007). For example, Peck and his colleagues (2010) found that TPAs have affordances for collaborative faculty and staff learning in addition to individual learning. This study highlighted several instances and events where faculty and staff collaboratively discussed and analyzed candidate work samples from the TPA. They found that such faculty involvement in collaborative analysis of TPA data helped program members learn more about the work of other faculty and staff involved in coursework and fieldwork. Ultimately these joint faculty experiences with training, scoring, and data interpretation related to the TPA led to the development of a common and concrete language of practice within the program, which helped facilitate collective programmatic change through further deliberation and action by groups and ultimately the program as a collective (Peck et al., 2009).

Peck and McDonald's (2013, 2014) study of data use related to TPA implementation found that in order to be acted on in ways that potentially improved the program, TPA data analysis activities had to be combined with the creation and use of organizational policies and practices that supported program-level data analysis and related decision-making and action. For example, quarterly program-wide retreats were held to support and facilitate data analysis and decision-making activities.

Stillman and colleagues (2013) described how seven teacher educators located in three different higher education institutions used PACT data to ground collaborative inquiry efforts. Concerned that PACT didn't assess candidates' ability to enact culturally responsive instruction, these seven teacher educators used both relevant scholarship and a random sample of local

PACT submissions to ask: "What is PACT's role in capturing teacher candidates' knowledge about and abilities to enact culturally responsive instruction?" (p. 5). In the process of answering this question they constructed a definition of the type of instruction they were inquiring about (which they call "contextualizing practice"), created a matrix tool to analyze and assess candidates' abilities related to contextualizing practice, and tested the matrix tool by applying it to their sample of PACT submissions. Through the process of jointly scoring PACT submissions using a common rubric, these teacher educators garnered insights they hoped would guide programmatic change at multiple institutions.

There are a variety of ways that programs are responding to policy changes at the state and federal level that suggest or mandate that programs use a variety of data sources (both locally and externally developed) to evaluate their candidates' competency and make data-informed decisions aimed at program improvement. While these policy changes sometimes have negative effects on faculty motivation and engagement in curricular and programmatic decisions (e.g., Rennert-Ariev, 2008; Kornfeld et al., 2007), some studies have highlighted ways that programs and program leaders have responded to new mandates while sustaining local values and faculty and program agency (e.g., Peck et al., 2009, 2010; Peck & McDonald, 2013, 2014; Sloan, 2013; Stillman et al., 2013).

Research Questions

In order to motivate and support broad participant engagement in data use, particularly as it relates to policy implementation, the data use literature from both the P-12 and teacher education contexts highlights two main findings: (1) the value of using data for programmatic inquiry related to local values and goals; and (2) providing programmatic supports for extensive and collaborative teacher or faculty engagement in data use practices. Both literatures also

highlight, but do not fully explain, the motivational aspects of teachers' or faculty members' participation in data use practices. Presumably there are also important differences in these motivational factors between the K-12 context and that of teacher education, given historical and current issues related to autonomy and academic freedom in higher education. This study aims to further understand why and how individuals and collectives participate in the process of collaborative, inquiry-oriented data use in three "high data use" teacher education programs situated in different institutional and policy contexts, as well as the conditions and resources that support faculty engagement in data use practices. This dissertation is guided by the following research questions:

1) What are the organizational practices that support or constrain collaborative data use practices in teacher education programs?
    a. Who participates? Why? How?
    b. What is the nature and role of leadership?
    c. What is the nature and role of collaboration?
2) What structural, cultural, and interpersonal supports foster collaborative faculty engagement in data use?

Chapter 3: Theoretical Framework

This dissertation investigates questions about the nature and process of collaborative, inquiry-oriented data use practices in teacher education programs, as well as the structural, cultural, and interpersonal factors that mediate collaborative faculty engagement in data use. The data use literature in P-12 and teacher education suggests that individual participants' motivations, experiences, beliefs, values, and goals matter in creating and sustaining data use practices that engage a variety of program participants in authentic ways, as do the goals of local institutions and programs. Understanding data use requires attention not only to the individuals and groups involved in the activity, but also to the context, including the organizational routines through which individuals interpret and use data, as well as the conceptual and material tools that mediate how individuals interpret information (Spillane & Miele, 2007).

To guide this study, I sought theoretical perspectives that would help me attend to interpersonal joint activity within particular historical and cultural contexts. In this section, I describe how sociocultural and cultural-historical activity theory perspectives on workplace learning can help illuminate the role of individual and collective motivation and agency in establishing and sustaining faculty engagement in workplace (e.g., data use) practices.

In order to examine what data use looks like in "high data use" teacher education programs, and what factors support or constrain the enactment of faculty data use practices, I draw on theories of social practice. My use of the term "practice" refers to sociocultural conceptions of practice in which learning occurs through participation in practical activity embedded within the social world (e.g., Lave, 1993, 1996; Lave & Wenger, 1991; Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995; Rogoff, 1990; Wenger, 1998). Wenger understands

practice as "doing" which occurs "in a historical and social context that gives structure and meaning to what we do" (1998, p. 47).

Conceptions of embedded social practice were useful for my investigation of collaborative data use practices because they focused my analysis on practice as it occured within and was shaped by its organizational, political, and interpersonal contexts. A sociocultural framework acknowledges that practice is effected by—and effects—various personal, interpersonal, contextual, cultural, and socio-historical factors (Lave, 1993, 1996; Lave & Wenger, 1991; Rogoff, 1990; Rogoff et al., 1995; Wenger, 1998). This tradition assumes that the enactment of professional practice is a process of learning, and thus that practice and learning are inescapably intertwined. Through practice that is mediated by and enacted within a particular socio-historical context, knowledge and meaning are produced, reproduced, and changed (Lave & Wenger, 1991).

The sociocultural tradition that grounds this proposed research assumes that individual and collective goals and actions are negotiated together in context (Billett, 2003, 2004, 2006, 2008a, 2008b, 2009; Billett & Somerville, 2004; Engeström, 1987, 2001; Lave, 1996, 1993; Lave & Wenger, 1991; Rogoff, 1990; Rogoff et al., 1995; Wenger, 1998). My conceptual framework integrates two bodies of theoretical scholarship on embedded social practice. Cultural-historical activity theory (CHAT) foregrounds practice as it occurs within cultural-historical systems (e.g. a teacher education program) and is influenced by the system's various participants, social structures, and conceptual and material tools. This tradition focuses on collective and organizational learning, and provides useful conceptual tools to help illuminate social and contextual factors that mediate faculty's collaborative data use practices. However, its focus on systemic analyses of collective learning proves less helpful in understanding individual

and group participation and learning within the overall system. As I will describe in greater detail later, while I employ a CHAT framework, I focus my analysis not only at the level of the system, but also at the level of interpersonal and collaborative practices. I explore connections between collaborative practices and systemic and cultural-historical factors.

In order to address how individuals and groups experience and engage in data use practices, I draw on second body of work that focuses on the role of individuals' identity, motivation, and agency in their engagement in social practice, including workplace practice (e.g., Billett, 2003, 2004, 2006, 2008a, 2008b, 2009; Billett & Somerville, 2004; Edwards, 2010, 2011, 2012; Lave, 1993, 1996; Lave & Wenger, 1991; Rogoff, 1990; Rogoff et al., 1995; Wenger, 1999). This work shares the same sociocultural assumptions about situated, social practice, and compliments a CHAT focus on systemic contributions to practice by reconsidering the role of the individual and interpersonal relationships. Edwards's work (2005, 2007, 2009, 2010, 2011, 2012; Edwards & Thompson, 2014) helped me focus on the role of individual and collective motives and the development of common knowledge in the construction of joint workplace practices within context. In the next section, I provide a brief history and description of these theories of social practice and consider their contributions for this study of data use practices in the workplace.

Theories of Social Practice

Practice-based approaches have become increasingly common in a number of fields within the social sciences, including psychology, organizational studies, and education, among others (Miettinen, Samra-Fredericks, & Yanow, 2009). While social practice theory is not a unified theory, there are some common approaches and traditions that undergird prominent strands of social practice theory. Many contemporary theories of social practice have roots in

practice theorizing that began in the late 1800s and early 1900s, which resulted in four philosophical approaches to practice, including: the Hegelian tradition, taken up by Marx; pragmatist theories; existentialist theories; and the analytical philosophy tradition (Miettenen et al., 2009). The tradition based on Hegelian dialectics as taken up by Marx is most relevant to my study and the theoretical work that underpins my conceptual framework. This tradition conceptualizes practice as a solution to the dualist opposition between idealism and materialism. It is represented in many contemporary sociocultural theories of learning and practice, including CHAT and sociocultural accounts of workplace learning.

Some contemporary social practice theories also draw from work by sociologists and philosophers of the late 20th century, such as Bourdieu (1977), Schatzki (1997), and ethnomethodologists such as Giddens (1984) and Foucault (1980) (Miettinen et al., 2009). Methodologically, social practice theories have sought to illuminate empirical studies of living practice as it relates to the history of the practice and the larger institutional contexts in which practice is embedded (Miettinen et al., 2009). This empirical agenda examines how everyday activity creates, reproduces, and transforms social order and institutions. Theoretically, contemporary social practice studies aim to address perennial problems in the social sciences including the Cartesian dualism of mind (cognition) and body. Scholarship that draws on the work of sociologists Bourdieu and Giddens has considered how the study of practice can illuminate and transcend tensions between agency and structure. Since Bourdieu's (1977) critique of structural and phenomenological theories in *Outline of a Theory of Practice*, theories of practice have incorporated issues of human agency (e.g., Giddens, 1979) and acknowledged the generative interconnections between people, activities, knowing, and the social world (Bourdieu, 1977; Lave & Wenger, 1991; Ortner, 1984; Wenger, 1998).

Contemporary theorizing about social practice and learning through participation in an ever-changing social world has roots in both the Marxist tradition as it has been taken up in the social sciences, as well as the tradition grounded in Bourdieu (1977) and Giddens's (1979) work (Lave & Wenger, 1991; Miettinen et al., 2009). These theoretical roots are illuminated in the fundamental assumptions of social theories of practice, such as the emphasis on the historical nature of social and culturally mediated experience as it occurs within context, and the understanding that through actions, structures are both reproduced and transformed. Based on these theoretical and historical roots, Lave and Wenger explained that:

> A theory of social practice emphasizes the relational interdependency of agent and world, activity, meaning, cognition, learning, and knowing. It emphasizes the inherently socially negotiated character of meaning and the interested, concerned character of thought and action of persons-in-activity. This view also claims that learning, thinking, and knowing are relations among people in activity in, with, and arising from the socially and culturally structured world. This world is socially constituted; objective forms and systems of activity, on the one hand, and agents' subjective and intersubjective understandings of them, on the other, mutually constitute both the world and its experienced forms… In a theory of practice, cognition and communication in, and with, the social world are situated in the historical development of ongoing activity. (1991, pp. 50-51)

These ideas about the relational interdependence between agency and structure suggest the need to simultaneously consider the historical and culturally mediated organizational contexts that data use practices occur within (in this study, notably teacher education programs), how these

contexts shape ongoing data use practices, and how individuals' and groups' data use practices perpetuate or transform organizational structures and cultures.

In the next section, I provide a brief historical overview of CHAT and explain how this theoretical tradition helped me attend to practices as collective and purposeful endeavors that are shaped by—and shape—interpersonal, cultural, and structural factors.

Cultural Historical Activity Theory

One of the core ideas of sociocultural theory based on Marx's work is that cognition is developed in the context of action and goal-oriented practical activity, and that the activity itself changes over time based on human contributions (Marx & Engels, 1998). Marx's ideas about the development of cognition through practical activity, dialectical materialism, and the reciprocal relationship between the individual and the collective were taken up and developed by Soviet psychologist Lev Vygotsky (e.g., 1978) beginning in the 1920s. Vygotsky's work established what is now referred to as first-generation activity theory.

Vygotsky introduced the concept of cultural mediation to explain how individuals' learning and development is mediated by their experiences in the social world and their engagement with other people and cultural artifacts such as symbols and tools. Vygotsky posited that "human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them" (1978, p. 88). While he focused on individual development, his key contribution was that individuals' learning—which drives their development—occurs through practical activity and interaction with cultural artifacts and the social world. Both Vygotsky and Marx emphasized that the relationship between the individual and the collective is dialectical and reciprocal. In other words, not only do cultural norms, practices, and tools such as language or books influence an individual's development, but the

individual also has the potential to simultaneously influence and change cultural norms, practices, and tools. Vygotsky argued that the individual and the collective each have a developmental trajectory—which he articulated as a genetic and cultural line of development—which interact and mutually inform each other (1978). Humans both internalize and *transform* cultural practice through their participation in practical activity.

The idea that individuals' participation in culturally-mediated, goal-oriented practical activity influences and transforms both the activity and the social institutions and contexts in which the activity takes place continues to be a key idea grounding social theories of practice. Some of Vygotsky's students (most notably Leont'ev and Luria) continued developing these ideas in what is now known as second-generation activity theory (e.g., see Leont'ev, 1981; Luria, 1976). These scholars brought the focus of the unit of analysis to historically evolving object-practical activity situated within social settings and collectives (Roth & Lee, 2007; Tsui & Law, 2007). They understood the collective and social contexts in which individual or group actions are embedded as cultural-historical activity systems that provide both affordances and constraints for both individual and collective learning.

Leont'ev (1981) also contributed the idea that activity systems are directed by a motive, and individual and collective action within that system must be understood in the context of the motive (i.e., *object*) of the activity system (Tsui & Law, 2007). Goal-oriented activity also involves individuals or multiple participants (i.e., *subject(s)*) who are motivated by the object of activity and who provide the point of view that guides analysis of the system. Physical and symbolic *tools* mediate the activity; these tools represent the mediating artifacts, socially constructed routines, and resources that may be employed to achieve the goal. The subject, object, and mediating tools are based on Vygotsky's ideas about social and artifact-based

mediation of activity, but Leont'ev's developments allow for the analysis of *collective* learning in addition to *individual* learning. The subject, object, and tools of a collective, cultural-historical activity system compose the top portion (and the most observable components) of the triangle heuristic developed by Engeström (1987) (Figure 1).

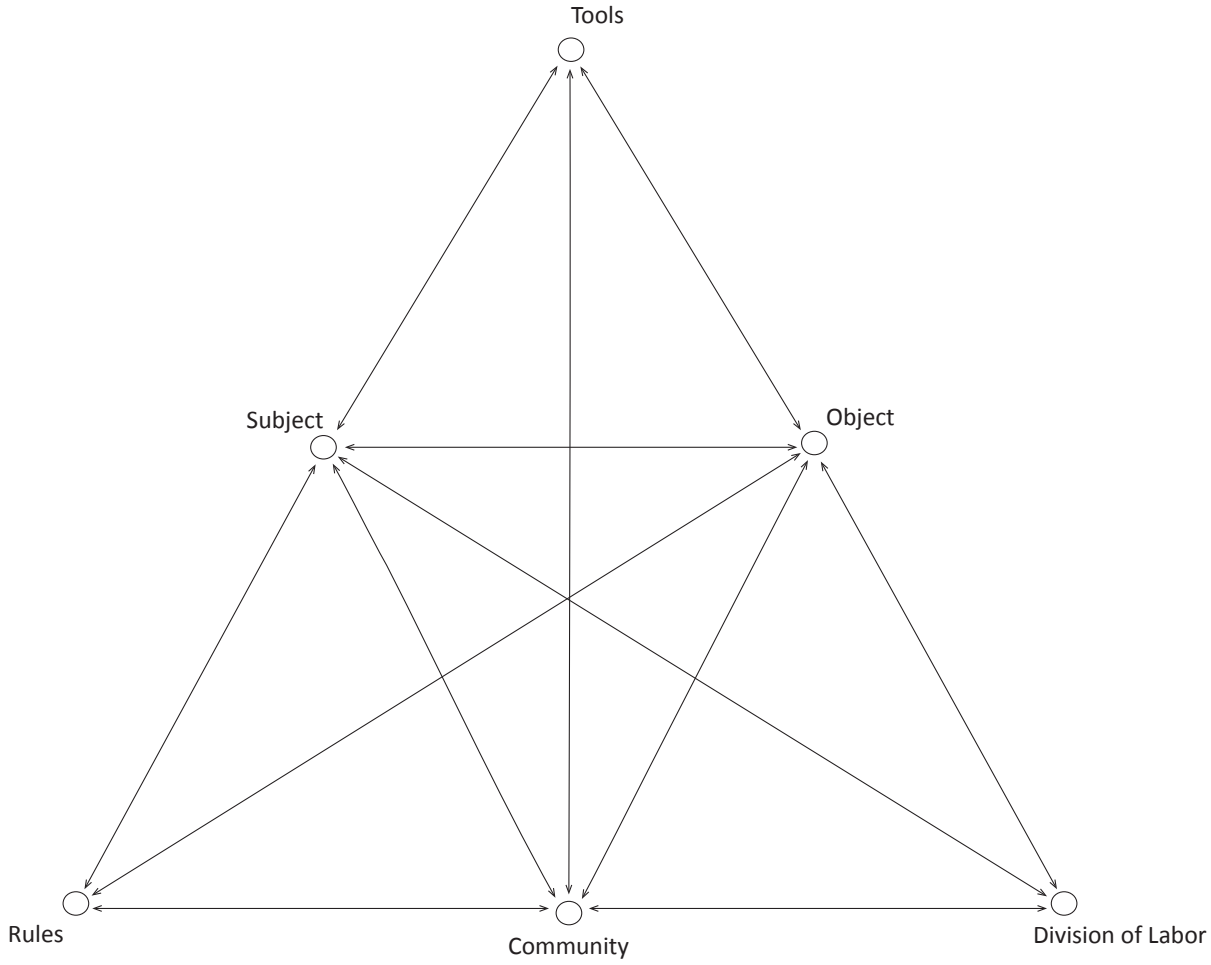

Figure 1: The components of an activity system (Engeström, 1987, p. 78).

Engeström (1987) expanded the conception of an activity system by articulating three more components of collective activity systems. In the CHAT triangle heuristic (Figure 1), the bottom of the triangle consists of the *division of labor*, which describes the roles of actors within

the system that constitute the implicit and explicit organization of the collective; the *community*, which describes the social contexts in which the activity takes place and the participating actors who share the same general object; and the *rules*, which describes the historical and cultural norms, expectations, conventions, and social relations that implicitly and explicitly mediate the relationship between entities and the activity and interactions within the system. The *outcome* of the activity system is the material or conceptual product of the mediated activity. All components of the activity system interact and mutually constitute each other (Roth & Lee, 2007; Roth & Tobin, 2002; Tsui & Law, 2007).

In what is referred to as "third generation activity theory," Engeström (2001) provided tools to analyze contradictions within and between interacting activity systems. Third generation activity theorists consider all activity systems open systems that are part of a network of activity systems that interact through joint work. In total, all activity systems constitute human society (Engeström, 2001; Roth & Lee, 2007). Engeström (2001) argued that as collective, socially and historically mediated activity occurs within and between activity systems, a process of *expansive learning* occurs. Expansive learning involves the mutual transformation of object and subject, as well as the expansion of the subject's action possibilities, in the process of evolving, collectively mediated joint activity. In other words, joint activity potentially redefines the object of activity and the participants, conceptual and material tools, social structures, and practices oriented to the object in a dynamic, dialogic process. Chapter 6 focuses on the three cases' processes of expansive learning, and Chapter 7 focuses on the role of particular interpersonal practices in maintaining processes of expansive learning.

Within a CHAT framework, learning is seen as interactive, where "human beings plan and change the material world and societal life just as these settings mutually transform agents

and the nature of their interactions with each other" (Roth & Lee, 2007, p. 198). This suggests paying attention not only to how personal, interpersonal, and contextual factors impact faculty data use practices, but also how those faculty member's actions affect the contexts in which they are embedded. CHAT assumes that all social and material entities in activity systems mediate each other and ongoing activity within and between activity systems. Activity systems continually change and evolve, and must simultaneously be understood within their historical context.

In a CHAT framework, *contradictions* within and between elements of the activity system drive change and learning (Il'enkov, 1977, as cited in Roth & Tobin, 2002). Engeström defined contradictions as "historically accumulating structural tensions within and between activity systems" (2001, p. 137) that drive learning and the transformation of a shared object over time. Activity theory provides a lens to analyze contradictions that may occur within one component of the activity system (e.g. within the rules), between components (e.g. between a tool and the object), and also across settings (e.g. TEPs and the K-12 schools in which candidates do their student teaching). The role of contradictions in expansive learning processes is a focus of Chapter 6.

Another key principle of CHAT that illuminates how learning occurs through the mutual mediation of multiple entities within and between settings is the *multi-voicedness* of activity systems. An activity system is a "community of multiple points of view, traditions, and interests" (Engeström, 2001, p. 136), which is mediated by the roles attributed to those multiple perspectives through the division of labor. This perspective accounts for individual participants' diverse histories and the "multiple layers and strands of history engraved in its artifacts, rules, and conventions" (Engeström, 2001, p. 136). In both individual activity systems and networks of

interacting activity systems, multi-voicedness becomes "a source of trouble and a source of innovation, demanding acts of translation and negotiation" (Engeström, p. 136).

Given the evolving nature of activity systems and tensions caused by contradictions and multi-voicedness, complete alignment of the goals, tools, and rules in a TEP setting is not only unrealistic, but also potentially unproductive. A CHAT perspective suggests that stability of goals would be impossible, given the assumption that all actors within an activity system—such as tenure-line faculty, adjunct faculty, supervisors, staff, and administrators—participate in the co-construction of the values and practices of that activity system (Roth & Lee, 2007). Values, goals, and practices continually evolve based on the negotiations of participants within and between activity systems.

CHAT focuses on the complex, situated, and distributed nature of ongoing activity and learning, and treats individuals as active social actors embedded in historical, organizational, political, and discursive practices (Roth & Lee, 2007; Roth & Tobin, 2002). CHAT also offers heuristics to help understand how social, contextual, and historical factors influence (and are influenced by) these social actors (Roth & Lee, 2007). A CHAT framework helped me attend to the practices enacted within multi-voiced activity systems, and how those practices were interpersonally developed, questioned, and negotiated.

In focusing on collaborative, social workplace practices, I am also concerned with individual and collective expertise and agency evident as people engage in practices. A CHAT framework—including Engeström's conceptualization of evolving, multi-voiced activity systems—allowed me to analyze the development and negotiation of social practices within a rich conceptualization of contextual mediating factors. In addition, CHAT's focus on object-oriented activity helped me consider the motives and values behind individual and collective

practices, as well as potential conflicts among motives. Other studies of data use practices in education have found that the purpose of those practices matters, particularly relative to participant engagement with and resistance to data use. CHAT will help me locate engagement and resistance within object-oriented activity.

While CHAT offers helpful tools for analyzing object-oriented activity within multi-voiced activity systems, it struggles to account for individual and group variation in participation within and across activity systems (Billett, 2004, 2006; Edwards, 2010; Nasir & Hand, 2008). In order to answer questions about engagement, collaboration, and leadership within teacher education programs, I turned to sociocultural perspectives that consider individual and relational agency, identity, and motivation as they are negotiated within and between settings.

Sociocultural Perspectives on Expertise, Agency, and Identity in Workplace Learning

While CHAT acknowledges that individual and group contributions affect activity systems and vice versa, this perspective generally considers individuals only as part of a process of collective or organizational learning. CHAT is less helpful in considering interpersonal aspects of practice (Billett, 2006, 2008; Edwards, 2010). In order to attend simultaneously to the development of collaborative practices and the role and development of the activity systems in which they take place, I compliment CHAT's organizational perspective with theoretical perspectives that illuminate the contribution and mediating role of individuals. These perspectives privilege the learning, agency, motivation, and identity of individuals and groups as they simultaneously influence and are influenced by activity systems.

Learning as development of expertise. These perspectives define learning as a process of transformation of participation in ongoing practice within situated communities of practice (Lave, 1996; Lave & Wenger, 1991; Rogoff, 1990, 2003). Over time, learning is "the historical

production, transformation, and change of person" (Lave & Wenger, 1991, p. 51). These perspectives still consider the effect of social, organizational, and environmental factors, but do so in relation to individuals' participation in activity systems or communities of practice. They also emphasize the impact of individuals' unique life histories and trajectories of participation in the social world, including individuals' previous formal and informal educational experiences and the ongoing process of identity formation.

However, Edwards (2005a) cautioned against seeing learning through participation simply as change in behavior shaped by context. In particular, she criticized the tendency for scholars using the participation metaphor to focus only on how individuals acquire existing knowledge within context, and called for developing an understanding of learning "which can deal with knowledge creation at the levels of both individuals and the systems in which they are operating" (2005a, p. 51). To consider how new knowledge is produced, she draws heavily on the legacy of Vygotsky and contemporary activity theory (described above). She explained that:

> One way of labeling the processes of learning outlined in this paper is to call it development of expertise, where expertise is a capacity to interpret the complexity of aspects of the world and have the wherewithal to respond to that complexity. That is, it is a process of expansive learning… This view of expertise acknowledges that there are bodies of knowledge, ways of thinking, sets of values and expectations of behaviour that are associated with particular culturally derived forms of practice and that these features of practice are themselves open to change. (Edwards, 2005a, p. 60)

One notable aspect of Edwards's approach to expertise is her consideration of expansive learning at individual and interpersonal levels, whereas Engeström (2001) defined expansive learning only at the level of the system. This approach facilitated my inquiry into not just in how and

why faculty engaged in data use practices, but also how those practices—and faculty's involvement in the practices—evolved.

Elsewhere Edwards argued that "expertise is demonstrated in our capacity to manipulate the social practices in which we engage in order to propel us forward in our intentional actions" (2010, p. 67). These intentional actions are directed by the culturally valued motives found in institutional practices (e.g., teacher education). In this sense expertise is defined as purposeful, object-oriented engagement in practices. Before I return to further discuss expertise in relation to collaborative workplace practices, including ideas about distributed and relational expertise, I will attend to the role of identity and motivation in purposeful engagement in practices.

Identity. From a sociocultural perspective, learning and identity development take place concurrently within collectively defined activity systems; they are embedded in the activities, tools, and interactions of the social world (Cobb et al., 2009; Greeno & Gresalfi, 2008; Holland et al., 1998; Lave & Wenger, 1991; Nolen & Ward, 2011). Wenger proposed that learning is a "process of becoming" and of transforming "who we are and what we can do" through engagement in practice (1998, p. 215). Sociocultural and situative learning theorists understand identity construction as a continually negotiated process as individuals reconcile their membership and participation in competing communities or social worlds (Hickey & Granade, 2004; Holland et al., 1998; Wenger, 1998). The identities promoted and afforded in particular activity systems and learners' access to those identities shapes individuals' engagement in related practices (Boaler & Greeno, 2000; Cobb et al., 2009; Nasir & Hand, 2008; Nolen & Ward, 2011). A sociocultural conception of learning, practice, and identity necessitates examination of the bidirectional relationship between an individual and the resources and opportunities of a particular activity setting (Greeno, 2001; Greeno & Gresalfi, 2008; Wenger, 1998). This

bidirectional relationship is also assumed in CHAT, though the emphasis is changed. CHAT foregrounds collective learning and change rather than foregrounding individual learning, engagement in practice, and identity creation in the context of social-contextual contributions.

Nasir and Hand's (2008) conception of *practice-linked identities* is useful for considering the role of identity in the development of particular professional practices in the context of the workplace. Practice-linked identities are "the identities that people come to take on, construct, and embrace that are linked to participation in particular social and cultural practices" (Nasir & Hand, 2008, p. 147). This understanding of identity formation through participation in context is similar to conceptions of *identity in practice* or *participatory identity* (Holland et al., 1998; Wenger, 1998). These concepts assume the mutual constitution of the individual and the social as identities are produced and renegotiated in the process of participation in practices organized by social, cultural, and historical worlds.

Individuals' opportunities to learn in and through practice are shaped by their personal histories and accumulated ways of knowing, doing, and being (Herrenkohl & Mertl, 2010) in addition to the affordances and constraints of activity systems. These personal histories of participation help attune learners to affordances in a setting and in activity, and simultaneously reshape the nature of the affordances themselves (Greeno & Gresalfi, 2008). The development of participatory or practice-linked identities also depends on how individuals become positioned in interaction. Positioning refers to "ways in which aspects of the system afford opportunities for different individuals to contribute differently" (Greeno & Gresalfi, p. 182). Learning settings such as workplaces construct differential affordances for agency and engagement in practice for individuals and groups, often depending on factors such as their affiliation, associations, position

within the division of labor, or language skills (Billett, 2001, 2004; Edwards, 2007; Fenwick, 2001; Greeno & Gresalfi, 2008).

A CHAT framework helped me attend to the affordances and constraints of activity systems by mapping out aspects of the system such as the tools and norms and division of labor and investigating the relationships among different aspects of the system, as well as how those relationships evolved. Sociocultural and situative perspectives on practice-linked identity helped me focus on how the activity system affects whether, how, and why faculty can or do engage with the opportunities afforded to participate in data use.

Agency. Some researchers argue that *agency* is an important mediating construct in understanding the dialectical relationship between the individual and the social (Billett, 2002, 2004, 2006, 2008; Cobb et al., 2009; Greeno & Gresalfi, 2008; Nasir & Hand, 2008; Nolen & Ward, 2011). Developing expertise through practice involves negotiations among workplace affordances and constraints, as well as individuals' agency (Billett, 2002, 2004, 2008). Billett explained:

> Despite the complex bases of contributions to learning provided by workplaces, decisions about engagement in and learning from work are not situationally determined. Individuals' agency mediates and shapes their engagement in work practice and what is learnt through that engagement. (2004, p. 117)

Perspectives on agency highlight how a socio-historic individual's unique prior social and cognitive experiences influence how they react and what they experience in immediate social experiences, such as those encountered through work practice. Individuals exercise their agency when deciding which problems or practices they will engage in and the degree of their

engagement; these decisions and actions then affect what is changed or learnt through their engagement (Billett, 2006).

A sociocultural framework assumes that workplace practices—such as data use practices in teacher education—are derived from their historic cultural enactment. An understanding of agency as a driving force in individuals' intentional actions suggests a key way in which historically influenced workplace practices are not only reproduced, but also modified or abandoned based on individuals' unique perspectives. Personal agency shapes how culturally derived practices are enacted, remade, and transformed in the context of work. When individuals remake and transform culturally derived workplace practices based on their purposeful agentic action, they in turn change the immediate social experience of work for both themselves and the workplace community (Billett, 2006, 2008).

Together, sociocultural ideas about identity and agency helped me attend to how and why people participate in practices. Edwards brought ideas about motivation and agency into her definition of identity as "an organizing principle for action: we approach and tackle what we think we are able to change and make changes in line with what matters to us: our interests. These interests are culturally mediated, but nonetheless experienced personally in terms of our commitments, standpoints and the resources available to us" (2010, p. 10). Thus individual motivation, identity, and agency mediate engagement in workplace practices.

The data use practices that were the focus of my analysis occurred both within and across practice boundaries in the sense that they often involved cross-role collaboration (e.g., between instructors and supervisors; across disciplines). In the next section I highlight some additional concepts from Anne Edwards's scholarship on inter-professional work and expertise that helped

illuminate the interpersonal and collaborative aspects of data use practices in teacher education programs.

Understanding Collaborative Workplace Practices

While ideas about both system-level expansive learning and individual learning, expertise, identity, and agency informed my investigation of data use practices, at times my focus lay in a conceptual space between the individual and the system. Conceptually my goal was to use the perspectives on workplace learning as developing expertise through engagement in practices as well as perspectives on learning as systemic change to illuminate relationships between interpersonal activities and systemic factors and changes.

My review of literature on data use in educational institutions highlighted the importance of distributed engagement and expertise as well as collaboration in developing and sustaining data use practices that meet internal and external accountability and program improvement goals. Given these findings, I focused this investigation of "high data use" teacher education programs on the nature and role of collaborative data use practices, including why and how program members participate in these practices, the nature and role of formal and informal collaboration, the nature and role of leadership, as well as systemic factors mediating the participation of program members. In order to guide my analytic focus on activities and collaboration (but in relation to systemic dimensions and changes), I turned to Anne Edwards's (2010, 2011, 2012) work on the relational aspects of professional practice. Her scholarship exists within a CHAT framework, and includes attention to the role of the activity system, but focuses on interpersonal object-oriented activity within and between activity systems. In this section I outline key concepts from this work that helped guide this study.

Edwards's research agenda has focused primarily on inter-professional work, including relational work at the boundaries of practice sites. For example, the *Learning in and for Interagency Working* project (*LIW*) examined inter-agency collaborations aimed at early interventions with vulnerable children and young people, and included collaborations between personnel at schools and other community agencies (Edwards, Daniels, Gallagher, Leadbetter, & Warmington, 2009). While this study focused primarily on what could be conceived of as a single activity system, teacher education programs have historically experienced structural and conceptual fragmentation, as well as the siloing of work within rigid divisions of labor between faculty, supervisors, cooperating teachers, and administrators (Goodlad, Soder, & Sirotnik, 1990; Howey & Zimpher, 1989; Zeichner & Gore, 1990). Within this context of conceptual and structural fragmentation, I conceptualized the joint work within TEP that data use entails as inter-professional when program members work across professional boundaries—for example when course instructors collaborate across disciplines (e.g., math, literacy, etc.), or between foundations and methods courses, or when course instructors, supervisors, cooperating teachers, and/or administrators work together on data use activities.

A key underlying premise of this body of work is that as people learn through engagement in practice, individuals highlight what matters to them as they interpret and respond to the work (Edwards, 2010, 2011, 2012). In CHAT terms, these motives are mediators between the subject and object and inform the process of interpersonal negotiation of the object of activity. Within an overall activity system (the TEP) whose object might be conceptualized as preparing excellent novice teachers, various practitioners may have different interpretations of this object that are mediated by their own professional backgrounds and specialist knowledge (Edwards, 2010). As different program members share their interpretations through joint

activity, they dialectically expand their understandings of the object. Edwards identifies several concepts and processes that facilitate interpersonal expansion of the object.

Relational expertise. Edwards (2010) calls for a relational turn in expertise in which professionals work resourcefully with others on task accomplishment. She draws on Engeström and Middletons's account of expertise, which expands the definition of expertise behind individual mastery of relatively stable knowledge and activities to the "collaborative and discursive construction of tasks, solutions, visions, breakdowns and innovations" within and across systems (1996, p. 4). Edwards argued that relational expertise is a capacity that should be developed alongside core professional knowledge. In the LIW study she and her colleagues (Edwards et al., 2009) found that a key aspect of relational expertise is "knowing how to know who," which is a capacity that "arose in discussions of object-oriented purposeful activities in which expertise and values were clarified and where 'know who' could be supported by tools… which reflected the professional values that shaped the engagement" (2010, p. 30).

Relational expertise involves recognizing what matters to others and aligning motives so that joint engagement continues (Edwards, 2010, 2011, 2012). Relational expertise does not require full understanding of the work and specialist knowledge of other professionals. Instead, "it is a matter of recognizing what others can offer a shared enterprise and why they offer it; and being able to work with what others offer while also making visible and accessible what matters to you" (Edwards, 2012, p. 26). This type of expertise necessitates the capacity to identify and question organizational purposes and practices, and to recognize and contribute to the distributed expertise available to support complex problem solving and task accomplishment.

Relational agency. Edwards described relational agency as "a joint and more powerful form of agency" that involves "an enhanced form of practice, which is potentially more

beneficial to professionals than claims to individual autonomy might be" (2010, p. 61). Relational agency is a capacity that is exercised in moments of joint work that aims to sustain productive joint engagement in work tasks to enhance their own response. This capacity emerges in two stages as people engage together in activities. It involves:

> 1. working with others to expand the object of activity so that its complexity is revealed, by recognizing the motives and resources others bring to bear as they interpret it
> 2. aligning one's own responses to the newly enhanced interpretations, with the responses being made by the other professionals as they act on the expanded object. (Edwards, 2010, p. 64)

This conceptualization of a collaborative form of agency allows actors to draw on their own expertise—both their core professional expertise and relational expertise—to intentionally work on common objects of activity.

Common knowledge. Edwards's (2010, 2012) conception of common knowledge draws on Carlile's (2004) conception of common knowledge as a resource for mobilizing knowledge across practice boundaries. Edwards focuses on the role of motives, arguing that common knowledge is based on shared understandings of practitioner's motives and intentions. Common knowledge is generated at intersecting practices in talk about potentially shared objects of activity where purposes and intentions are made explicit (2010, 2012). In that sense the exercise of relational expertise and relational agency builds, contributes to, and employs common knowledge. Building common knowledge between practitioners involves aligning motives in order to further intentional, object-oriented task accomplishment. In this sense building common knowledge involves a parallel process of personal sensemaking and public meaning-making (Edwards, 2010, 2012).

Role of leadership. Edwards (2012) highlighted the role of leaders in fostering opportunities for relational agency and in planning for and building common knowledge through structural and cultural changes to the work. In two studies about leadership, Edwards and colleagues (Daniels & Edwards, 2012; Edwards, 2012; Edwards & Thompson, 2014) found that leaders helped create the conditions that furthered continuing object-oriented collaborative work. This involved leaders using common knowledge as a strategic tool and collective resource for inter-agency collaboration. As people worked within and between professional practice boundaries, leaders employed relational expertise to attend to interwoven motives of different actors to help interpret and negotiate changes in practices. In this way, leaders exercised expertise in identifying and developing workforce capacity in order to further object-oriented collaborative work and work towards systemic changes to foster and sustain such work.

Another key role of leaders was to develop organizational narratives that weave together motives and priorities of both the professionals involved and the organization(s). These organizational narratives reify the motives and shared purposes of the professionals and give direction to the change process as the object of activity is continuously reworked through joint activity. While leaders can facilitate this process, it's essential that other participants are included in the process; the organizational narratives are created and recreated by participants such that actors see their motives and priorities reflected in them and feel a sense of ownership through the change process. As Edwards argued, for these "narratives to bring cohesion to complex sets of tasks, other voices and views needed to play into them. They needed to be owned and not imposed" (2012, p. 29). The institutional narratives became tools that provided clarity to the common, overarching purpose of the work as well as a framework within which to

assess current and future practices. Edwards and Thompson (2014) argued that these narratives can also make visible affordances for action within the organizational vision.

Edwards and Thompson (2014) found that leaders in a new inter-agency collaboration "recognized the unsettling effects of the structural and material upheavals on practitioners' identities as expert specialists. Their solution was… to pay attention to releasing the personal agency of the practitioners and to aligning the professional motives, that is, the 'what matters' of, for example, social workers, psychologists, teachers, and family workers with a strategic agenda, in order to achieve measurable good outcomes for children" (2014, p. 101). The authors claim that these processes help build what Engeström labeled "collaborative intentionality capital" (Engeström, 2008, p. 200) as a resource for organizational development.

This process of leaders encouraging professionals' personal agency and aligning professional motives with a strategic, object-oriented agenda was important for understanding the collaborative work that goes on in "high data use" teacher education programs. This work helped me attend to the dialectical relationship between personal sense-making and public meaning-making in relation to individual and collective purposes, as well as the relational aspects of leadership.

Figure 2 illustrates how I conceptualize this work within a CHAT framework. The relational capacities that Edwards identified operate within a conceptual space of joint activity that mediates the subject and object. Subjects come into formal and informal collaborative activities bringing their own professional histories, motives, identities, and expertise. Edwards's research suggests that as problems of practice are worked on relationally towards an evolving object (in this case generally conceived of as data use for inquiry and program improvement), participants co-create common knowledge; a system of distributed expertise; new or evolving

program practices and tools; and organizational narratives that articulate the evolving object of activity as it relates to program practices and participation.

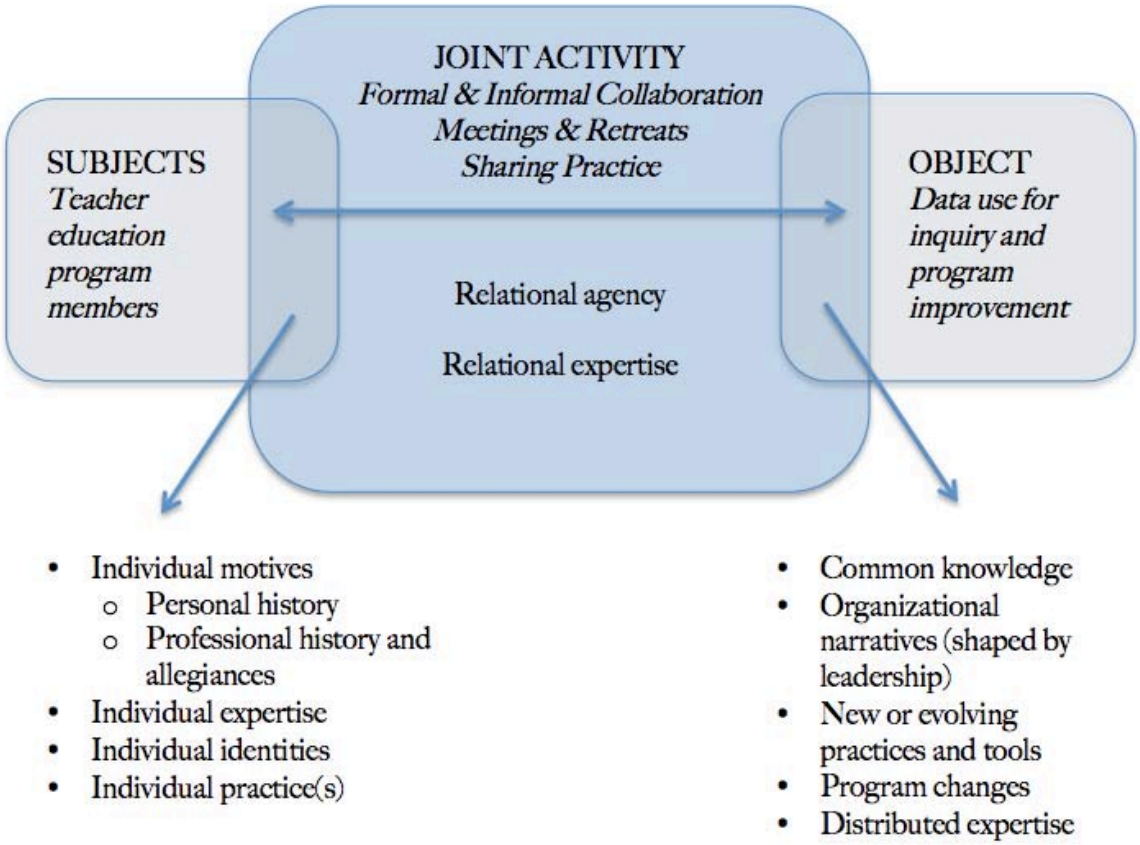

Figure 2: Framework for examining collaborative, relational workplace practices

In the next chapter I discuss the research design and methodology for this study. I consider the methodological implications of this conceptual framework for my analysis of collaborative data use practices as I attempted to protect the integrity of the relational interdependence of individual, social, and systemic contributions to practices.

Chapter 4: Research Design and Methodology

This chapter outlines the multiple case study design and methods (Merriam, 2009; Stake, 2013; Yin, 2009) that guided this research. In this chapter, I explain my multiple case study design and implementation, including a description of my qualitative data collection methods and data analysis.

Research Design

My conceptual framework attends to the relationships between individual, social, and structural contributions to workplace practices and learning; the nature and role of joint work; data use practices themselves (e.g., how the data use process unfolds in particular activities); the contexts in which data use practices occur; and the cultural and structural factors that influence data use practices (e.g., organizational division of labor, collective goals, tools). Given this framework, my data collection and analysis required a methodological approach that allowed me to capture social and interpersonal experiences and dynamics within complex, real-world settings. Qualitative inquiry is particularly well suited to investigations of experiences and local understandings as they naturally unfold within social contexts (Erickson, 1986; Merriam, 2009; Matthew B. Miles, Huberman, & Saldaña, 2014; Michael Quinn Patton, 1990)(Erickson, 1986; Merriam, 2009; M. B. Miles & Huberman, 1994; Michael Quinn Patton, 1990).

A qualitative case study approach facilitated investigation of "a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p. 18). Case study designs focus on detailed descriptions of a bounded phenomenon within its real-life context (Merriam, 2009; Yin, 2006, 2009). A multiple case study approach (Merriam, 2009; Stake, 2013; Yin, 2009) allowed me to investigate the data use practices of a set of teacher education programs. Given

that previous research about data use practices within teacher education programs is sparse, a multiple case study approach could expand the field's understanding of these practices through the development of a rich, holistic account of this particular phenomenon as well as tentative hypotheses that could help guide future research (Merriam, 2009; Yin, 2009).

A multiple case study design also allowed for the depth in data collection and analysis that is necessary to illuminate goal-oriented activity as it relates to and is mediated by a variety of personal, interpersonal, and contextual factors. Qualitative research facilitates exploration of these mediating factors, which might include: individual program members' professional identities, motives, expertise, and practices; program members' relationships with other participants in the program and potentially with others located outside the activity system; implicit and explicit program rules and norms; the local, state, and national policy contexts within which programs are embedded; the cultural-historical norms and tools related to the program members' particular role (e.g., supervisor, tenure-track professor; adjunct course instructor); the division of labor and differing goals among various program members; and other factors that might emerge from the data.

Qualitative approaches focus on "the ways people in particular settings come to understand, account for, take action, and otherwise manage their day-to-day situations" (M. B. Miles & Huberman, 1994, p. 7) through data collection that takes place in natural settings. This "local groundedness" (Miles & Huberman, 1994, p. 10) facilitates exploration of previously unknown or unique factors as well as consideration of those factors that pervious research has shown impact data use practices, such as orienting programmatic inquiry to local values and goals, and providing programmatic supports for collaborative engagement in data use practices.

A multiple case study approach allowed me to investigate the practices of a few teacher

education programs. An initial cross-case analysis of ten programs situated within a larger qualitative study supported a more in-depth investigation of three of the most information-rich cases in order to support theory building about the nature of collaborative data use practices and the impact of contextual factors on those practices (Miles & Huberman, 1994). This methodology facilitates efforts to contribute to the field's understanding of the nature of collaborative data use practices, how teacher educators attempt to enact individual and collective goals through those data use practices, and how engagement in these practices depends on various mediating factors.

Overview of Data Collection Strategy and Procedures

This proposed investigation is situated within a larger qualitative case study (Merriam, 2009; Yin, 2006, 2009) of ten teacher education programs with high levels of data use conducted by a three-person research team of which I am a member[1]. I will first describe the data collection, which occurred in context of the larger study, and then I describe my analysis for this dissertation.

We began our study by seeking nominations from professional organizations involved in teacher education programs around the country (e.g., NCATE, AACTE) regarding programs that reported high levels of "data use" in program surveys and accreditation reviews carried out by these organizations. From this list we selected 16 programs, representing variation in institutional mission, size, and state policy context, for follow-up telephone interviews with program administrators (deans and directors of teacher education). In these telephone interviews we inquired about the kinds of data use policies and practices they had developed in order to gain

[1] The co-principal investigators for the larger study were Charles Peck and Morva McDonald from the University of Washington. This study, funded by the Spencer Foundation, was entitled *Evidence and Action: Investigating the Organizational Practices of Data Use in Programs of*

a more concrete and specific understanding about the extent to which each program was engaged in regular data use activities.

From these 16 programs, 10 with particularly strong organizational commitments to data use were selected for follow up one to two day site visits in which we interviewed program faculty and administrators and collected a variety of artifacts documenting program practices in an effort to learn more about how the programs supported data use activities. In selecting programs for site visit, we attempted to include institutions of varying sizes and types (large public teacher preparation institutions, private colleges, and "alternative route" programs), as well as programs from states in which varying kinds of outcome data were available (e.g., "valued-added" measures of P-12 student achievement; standardized teacher performance assessments).

After carrying out site visits to each of the 10 programs, we selected three (attempting to retain variation in institutional mission, size and policy contexts) for extended study. These three cases were chosen for their organizational commitments to data use for program improvement purposes as well as the diversity of their institutional contexts. We visited each of these programs two to four times over the course of two years. In addition to these visits, we conducted multiple phone interviews and email exchanges with program faculty and administrators in an effort to more fully document the ways in which each of these programs supported ongoing activities in which outcome data were systematically used to improve program policy and practice.

In order to select a set of cases for this dissertation study, I engaged in an initial cross-case analysis of all 10 programs that received a site visit (see "Phase one" data analysis section below). I selected the University of California, Santa Barbara; East Carolina University; and

Alverno College for this dissertation study based on that analysis (see Chapter 5 for an in-depth description of each case). These three programs demonstrated strong commitments to using data for program improvement purposes, as well as to broadening participation in data use. In addition, these three cases had the richest and most extensive data sets available based on their selection for extended study.

Consistent with the principles of systematic qualitative case study research (Merriam, 2009; Patton, 2003; Stake, 2013; Yin, 2009) we collected data from a variety of informants and from a variety of sources as a means of triangulating perspectives on each program as a organizational case of data use in practice. Both face to face and telephone interviews were conducted with key personnel (e.g., administrators, faculty, program assessment officers). In total we conducted 148 recorded interviews and focus groups. Wherever possible, we directly observed and made field notes at relevant program events such as data analysis meetings, curriculum planning meetings and faculty meetings in which program outcome data were discussed. We collected a variety of program documents for each site, including copies of program philosophy statements, minutes from relevant meetings, job descriptions, and compensation policies. Narrative data were transcribed and entered into Dedoose, a web-based program for qualitative and mixed methods data analysis.

Data Analysis

The study's data collection activities yielded large amounts of data. To mitigate the risks of being overwhelmed by the data or analyzing data in an unfocused manner, I systematically reduced the data in two phases of analysis. The first phase involved an initial cross-case analysis of the 10 site visit programs. I used this analysis to choose three cases for more intensive analysis in the second, and main, phase of this investigation. These two phases of analysis are

described in detail below.

Phase One: Cross-case analysis of ten programs. The first phase of data analysis was a cross-case analysis of all ten programs that participated in at least one site visit. I began by using the coding and case summaries created by the research team (myself included) from the larger study in order to determine whether and how much additional coding was necessary. This process will be aided by the fact that I had read almost the entire data corpus in my capacity as research assistant on this project, helped create the coding structure, and also conducted the coding on the majority of the interviews as part of the research team's analysis. By the end of this phase, I had read the entire data corpus.

The bulk of my analysis for this study focused on examining the nature and process of data use activities; the nature and extent of faculty engagement in data use activities; and their relationships to individual, interpersonal, cultural, and contextual factors in their programs.

Coding. I used a qualitative data analysis program (Dedoose) to organize and label study data. All participant names were removed for confidentiality and replaced with pseudonyms.

The coding structure used for the larger study was consistent with my CHAT framework, and also included codes related to issues of faculty engagement that was the primary focus of my analysis. Our collective data analysis process began with an "open coding" procedure, wherein each of our three-person research team independently read through transcripts and identified text segments of hypothesized relevance to our general research question. We then met to compare segments of text, and developed low inference "tags" which we used to identify text segments in subsequent analyses. Over the course of several meetings in which we compared tagged text segments, we consolidated these into a set of categories we believed would be useful for sorting our data across cases. The coding hierarchy and tags used to code the entire corpus of interview

data are found in Appendix A, along with brief descriptions of the codes.

Case summaries. During initial data analysis for the larger study, our research team employed the coding structure in Appendix A with all interview data. In addition, we created case summaries for each case, including description and relevant data about: the program's institutional, state, and local policy contexts; programmatic goals related to data use; programmatic data use processes and practices; and organizational factors supporting or constraining their data use processes and practices.

Analytic memos and matrices. I used both existing coding and case summaries to begin to explore my research questions across all ten cases. Clustering techniques helped me identify patterns in the data, move to higher levels of abstraction, and identify outliers or disconfirming evidence (Miles & Huberman, 1994). For example, as I reviewed the case summaries and interview and documentary data from the ten cases, I created analytic memos and data matrices related to my conceptual framework and research questions. The analytic memos investigated how particular themes shed light on my research questions, using my conceptual framework to guide this analysis (Emerson et al., 1995). I wrote memos that described and examined patterns across thematic codes, as well as memos about which cases might be particularly information rich for extended, more in-depth Phase Two analysis (described below).

In addition, I developed data matrices to help display and analyze themes within and across cases (Miles & Huberman, 1994). For example, the tables provided in Appendix B provide a summary of each of the ten cases' activity systems, the nature and extent of collaborative data use practices, and some of the organizational, cultural, and interpersonal factors and resources that supported or hindered data use practices. These memos, and others like them, were created to support the selection of a smaller sample of cases for more in-depth

analysis in Phase Two (described below). Phase One memos and matrices also helped me develop hypotheses regarding collaborative data use practices and the factors that support or constrain that work across the ten sites. In addition, they provided ways to trace my findings back to the data (Coffey & Atkinson, 1996; Yin, 2009).

Phase Two: In-depth case analysis of one to three programs. I used a *purposeful sampling* approach to determine the three most information-rich cases for further, more in-depth analysis in Phase Two (Merriam, 2009; Miles & Huberman, 1994). These cases are described in depth in Chapter 5. The goal of Phase Two analysis was to examine emergent themes from Phase One analysis related to my research questions in more depth using the three focal cases. I employed the following resources to determine which cases to include in Phase Two analysis:

- The ten case summaries
- Phase One analysis, including data matrices and analytic memos
- Information about the body of data available for each program (e.g., how many site visits, interviews, observations, and artifacts were available)

The goal of this step was to ensure that I select the most information-rich case(s) that could support the development of hypotheses and help lead to future research regarding collaborative data use practices, rather than empirical generalization (Patton, 1990). I used the following criteria to select case program(s) for the second stage of analysis:

Data use practices. I was specifically interested in programs that have strong collaborative data use practices and widespread faculty engagement in data use. I was interested in exploring why and how faculty, supervisors, and administrators participate in workplace data use practices, and how their participation is supported or hindered by individual, interpersonal, and contextual factors as discussed in my conceptual framework. I was not interested in the

overall prevalence of data use practices for the purposes of this analysis. Therefore, looking at strong cases of this phenomenon is a promising place to start exploring the nature of collaborative data use practices and how organizations can foster widespread engagement in them. Furthermore, since I was interested in data use practices as a case of the larger phenomenon of teacher educators (and even more broadly, workers) enacting their knowledge and beliefs through goal-oriented collaborative workplace practices, I needed to ensure that my case programs had strong faculty engagement in data use practices.

Variation in context. In our initial sample of 10 programs we investigated institutions of varying sizes and types (large public teacher preparation institutions, private colleges, and "alternative route" programs), as well as programs from states in which varying kinds of outcome data were available (e.g, "valued-added" measures of P-12 student achievement, standardized teacher performance assessments). I retained variation in institutional mission, size, and policy contexts in my three focal cases.

Data sources available. There was variation in the amount and types of data collected for each of the ten cases based on site access and availability, as well as whether the sites were chosen for follow-up, more in-depth investigation. The three cases chosen as more "intensive" cases had the largest amount of data available, including observational data (see Table 1 for information about available interview, focus group, and observational data). Given that observational data is important in understanding how faculty exercise relational agency and expertise and negotiate goals in real-time joint activity, these three intensive cases provided the greatest depth of information for my analysis. These three cases were also chosen by the research team as programs with particularly strong data use practices and organizational commitments to data use based on initial data analysis, making them a likely source of

information-rich cases. Therefore these cases also offered data collected over a longer period of time than the other seven cases that received only one site visit; these programs received two to four site visits over the course of two years (June 2012 to June 2014).

Table 1: *Overview of interview, focus group, and observational data for Phase Two analysis*

Program	Site Visits	Interviews & Focus Groups	Observations
UCSB	3	20	2
ECU	4	38	2
AC	2	24	1
Total	**9**	**82**	**5**

Coding. Once I choose the three cases for in-depth Phase Two analysis (these cases are described in detail in Chapter 5), I continued using a qualitative data analysis program (Dedoose) to organize and label my data. My analysis focused on additional coding and other analysis activities (such as creating data memos and matrices) aimed at understanding emergent themes from Phase One in greater depth. This analytical process occurred in stages and included the following steps: (1) an initial round of open coding of all the relevant data, during which I focused on categories and themes related to my research questions and emergent themes from Phase One (Coffey & Atkinson, 1996; Emerson, Fretz, & Shaw, 1995); (2) the development of a code list based on my initial reading of the data as well as "start list" of codes derived from both my literature review on data use practices (both generally and more specifically in teacher education) and my conceptual framework (Miles & Huberman, 1994); (3) multiple coding passes during which I refined the code list based on emergent themes and theoretical constructs (Coffey

& Atkinson, 1996); and (4) focused coding of all the data, during which I looked for broader trends and patterns within and across data use episodes (Emerson et al., 1995). The coding hierarchy and tags I created and employed for Phase Two coding are found in Appendix C along with brief descriptions of the codes.

Data analysis was an ongoing and iterative process that involved categorizing data based on both emergent themes and themes derived from my literature review and conceptual framework. Once I developed and applied these codes to the relevant data, I began to search through and compare different episodes to illuminate broader trends and patterns (Emerson et al., 1995). After coding, I will employed clustering techniques similar to those explained in Phase One analysis to consider patterns in the data, move to higher levels of abstraction, and identify outliers or disconfirming evidence (Miles & Huberman, 1994).

Analytic memos and matrices. I created memos to summarize how particular themes shed light on my research questions, using my conceptual framework to guide this analysis (Emerson et al., 1995). I also wrote memos that described and examined patterns across thematic codes. In addition, I developed matrices to help display and analyze themes within and across cases (Miles & Huberman, 1994). Ultimately, these memos and matrices helped me develop hypotheses regarding collaborative data use practices and the factors that support or constrain that work. These memos and matrices also provided ways to trace my findings back to the data (Coffey & Atkinson, 1996; Yin, 2009).

Ethical Considerations

Our research team engaged several strategies to ensure the protection and rights of study participants. Some of these strategies included: consistently informing participants about the purpose of this study and my role as a graduate student; consistently informing participants about

the methods employed in this study; obtaining informed consent throughout the study to ensure participants are aware of their rights; keeping all participants' identities confidential by using pseudonyms and omitting identifying characteristics of the study participants; allowing participants full access to their interview transcripts; and keeping research-related records and data in secure storage to ensure that members of the research team were the only people with access to the material (Merriam, 2009).

Trustworthiness

To ensure the strength and trustworthiness of our claims and conclusions, the study was designed in such a way that multiple sources of data could triangulate these claims (Merriam, 2009; Miles & Huberman, 1994; Yin, 2009). The data from interviews, observations, and document reviews informed one another during analysis; for example, when program members described data use practices in interviews, to the extent possible I triangulated this information using interviews with other informants, observational records of program practices, and documentary records of program practices (Miles & Huberman, 1994).

Throughout data analysis, I shared my ideas, dilemmas, and insights with others, including professional colleagues and advisors, to explore potential biases and issues, and to facilitate more rigor and reflection in my work.

I also incorporated member checks with participants, giving them the ability to comment or provide feedback on my emergent themes, interpretations, and findings (Merriam, 2009; Miles & Huberman, 1994). These member checks occurred primarily through two data retreats and conference collaborations with program leaders and faculty members at each of the three sites. At our initial data retreat with members from each of the three sites, we shared the case memos created as part of the team analysis (described above) as well as some de-identified interview

data. Program members shared their feedback about the case memos, including what they thought we represented well and what they thought was misrepresented or missing. In the context of that data retreat and a second one held the following year during which we began a collaborative book project, I was able to share ideas and get feedback from program leaders and faculty members. In addition, we checked our understandings based on initial analyses during the course of the two years of data collection through conversations at site visits, phone interviews between site visits, and email correspondence.

Chapter 5: The Development of Collaborative Data Use Practices at East Carolina University, University of California Santa Barbara, and Alverno College

Introduction

In this chapter I provide an overview of the institutional context and history of each of the three teacher education programs (TEPs) with respect to their data use practices. I pay particular attention to each program's history with new and evolving state and national accountability contexts; the state and program-level data sources available to the TEPs; the organizational data use processes and practices developed in response to internal and external pressures around data use; faculty and other program member engagement in data use processes and practices; and organizational and interpersonal factors that affect those practices the nature of program member engagement in data use.

I draw from CHAT to help me foreground organizational practices while also attending to the social, cultural, historical, and political dimensions that shape, and are shaped by, these social practices. These dimensions include the relationships between cultural norms, contextual factors, conceptual and material tools, and individual and collective responsibilities, goals, and motivations (Roth & Lee, 2007; Roth & Tobin, 2002). The CHAT framework assumes a dialogic relationship between the subject and object. Within this context, learning involves the mutual transformation of object and subject, as well as the expansion of the subject's action possibilities in the process of evolving, collectively mediated activity. Learning is seen as interactive, where "human beings plan and change the material world and societal life just as these settings mutually transform agents and the nature of their interactions with each other" (Roth & Lee, 2007, p. 198). While Engeström's triangle heuristic (see Figure 1) identifies six components of an activity system, it's important to note that all social and material entities in

activity systems mediate each other and ongoing activity. Thus, activity systems continually change and evolve, and must be understood within their historical context. This chapter aims to provide the historical context of each activity system and begin highlighting the programs' similarities and differences. Subsequent cross-case chapters explain in greater detail the role of contradictions in the evolution of each TEP's systemic responses to pressures around data use (Chapter 6) and the role of interpersonal and relational resources in creating a culture of evidence (Chapter 7).

While I don't always explicitly use CHAT language, the narrative for each program attempts to make clear how the components of each system operate together in response to new accountability policies, which represent a disturbance to the system. It's important to remember that there is a dialectical relationship between the six elements of the activity system triangle heuristic; these elements interact and mutually constitute each other (Roth & Lee, 2007; Roth & Tobin, 2002; Tsui & Law, 2007). The goal of a CHAT analysis, and both the individual program and cross-case analyses presented in this dissertation, is to illuminate the systemic whole of an activity, not just its separate components. A table associated with each case describes several outcomes related to data use, and the activity system supports and resources that contributed to those outcomes (Tables 2-4).

It is worth noting that while all three programs experienced some of the perennial tensions and challenges endemic to teacher education—notably divisions in status, collaboration, and communication between research faculty, adjunct practitioner faculty, supervisors, and cooperating teachers—their contextual and programmatic differences make those challenges manifest differently. In the case narratives, I briefly describe for each program both historical and emergent issues and practices, and investigate whether and how the introduction of new

tools (such as a standardized performance assessment tool) has impacted program practices, culture, and community. During the period of our data collection, all three programs were undergoing various changes related to evidence use and decision making. Notably, all three programs had recently begun piloting edTPA during the period of our data collection.

East Carolina University

Context. East Carolina University, originally founded as East Carolina Teachers College in 1907, is part of the network of 17 public universities in the state of North Carolina. ECU prepares 700-750 new teachers for licensure each year through 17 programs at the undergraduate and graduate level, which means every systemic change initiative is saturated with issues of scale. These challenges manifest not only in administration of multiple programs within the College of Education (COE), but also in coordinating and supporting a variety of teacher education programs delivered from five other colleges around the university, including the College of Arts and Sciences, the College of Human Ecology, the College of Health and Human Performance, the College of Fine Arts and Communication, and the College of Allied Health Sciences. The Office of Teacher Education oversees about 4,500 student placements each year.

The "mission of the College of Education is the preparation of professional educators and allied practitioners" (http://www.ecu.edu/cs-educ/), and COE members spoke about the important role the institution plays as the primary producer of new teachers in eastern North Carolina. The university, and the COE, showed clear commitments to serving their community by offering accessible opportunities in higher education, and by training "more effective novice teachers who can have a positive impact on PK-12 students as soon as they enter the classroom" that "the community of stakeholders in eastern North Carolina—candidates, faculty, public school partners, and community leaders want and need" (NCATE Transformation Initiative

proposal). The COE's 2014-2019 strategic plan stated that the institution "will be a leader in the assessment of learning outcomes and the use of innovative teaching strategies. Faculty will lead examination and pursue needed reforms of general education requirements that will be a model for others to follow." Additional goals included being a national model for teacher preparation, diversifying the undergraduate and graduate candidate population (specifically including community college transfer students, military and veteran students, distance education students, and students from minority populations) through recruitment and retention supports, "preparing education professionals to develop an educated workforce that will attract and support business and industry", and expanding access to education through the development of distance education opportunities.

State accountability policies in North Carolina were extensive, with a clear and consistent emphasis on evidence and outcomes. As one informant put it: "if you are in a school in the State of North Carolina, data is what drives the school decisions. If you cannot support a program or initiative with data, you're not going to be funded to do it" (Faculty). Education accountability policies pervade every level of the system, and often carry extensive reporting requirements, and serious consequences for not meeting state expectations. Academic leaders expressed frustration with many of the state accountability policies, noting a variety of unintended side effects in the implementation of new "value-added" metrics used to evaluate and rank teacher education programs, including issues around data access and not having the detailed analyses needed to make sense of data. In response to these kinds of frustrations, state leaders, policy researchers and a consortium of North Carolina deans and directors of teacher education subsequently undertook a collaborative effort to do post hoc "drill down" analyses of the state value-added data set in an effort to make the state-level data more useful to programs. The ECU dean was a

strong advocate for this initiative, and while these efforts initially faced a variety of systems-level difficulties, they eventually did lead to more productive and useful analyses.

The first year of her appointment, the COE dean applied for a US Department of Education Teacher Quality Partnership Grant (TQP) grant because "I wanted to be able to have resources for program development. I had this vision for what schools of education should be doing that have our culture, context, and mission." In 2009, the COE received a large TQP grant aimed at evaluating and improving their program in several key areas, including curriculum reform and clinical partnerships. The following year, the COE joined the national Teacher Performance Assessment Consortium (TPAC) and began piloting and field testing the edTPA in several teacher education program areas. The ECU investment in these projects has led to a significant increase in the national visibility of their work in educator preparation.

While data use has not been the sole focus of these projects, each of them has involved systematic collection and analysis of a variety of program outcome measures, and the idea that data should be integral to decision making has, over time, become a salient principle of practice in the college. An academic leader described how this principle challenged the previous status quo:

> One of the outcomes of this work, I hope, is that changes in programs become data driven. Changes in coursework are data driven. We don't just change them because a group of faculty sit down and say, "I think we ought to add another course to the program." That's a real difficult switch because if you do a data pilot, then the question is, you're changing the course, but you didn't go through the curriculum committee. So the question is, why would you go through the curriculum committee if you don't even know if it's going to work? Well, there's no mechanism in the university for pilot

> programs, pilot courses, experimentation. Yet we're supposed to be generating knowledge. So I think we're in a whole new sort of uncharted territory. (Program administrator)

In both this and subsequent chapters, I show how ECU navigated this "uncharted territory" during the course of our data collection, including how they built a new "mechanism in the university for pilot programs, pilot courses, experimentation" and adjusted formal and informal organizational structures, job expectations, and cultural norms to facilitate new data-based research projects that could inform program improvement efforts.

Organizational Supports for Data Use Practices and Processes. During the two years of our data collection, ECU's teacher education programs were in the process of "moving to a system that uses data, both formatively and summatively" (Dean). The COE's dean argued that program leaders should decide: "are you looking to maintain your programs or continuously improve them?" She considered the status quo in many TEPs, wherein programs are primarily concerned with meeting external standards, as the "last generation context". The dean articulated the increasingly common demand for TEPs to not only meet standards, but also to continuously learn from data and use data-based knowledge to improve their programs. This was a goal she identified for ECU, though it's significant that she continuously reframed data-informed program improvement as something that should be motivated by internal goals rather than by external goals such as accreditation: "If you believe that someone's breathing down your neck and you're doing it out of fear, the outcome can't be positive; it's not going to be positive" (Dean). She reframed both the object of data-informed program improvement and the broader idea of accountability as an internally-motivated process of "taking control of your institution":

> I think when you start thinking in that perspective — that it isn't just to satisfy an accrediting agency, it isn't just to do the minimum to get approved, it isn't just about satisfying a doubting public — then it really is about taking control of your institution, your institution taking control of itself and charting a course for doing what they do better as an integral part of the everyday work. (Dean)

Throughout her interviews, the dean linked the idea of evidence-based program improvement with the "moral imperative" of preparing excellent beginning teachers who can "[launch] as quickly as they can" (Dean). Though this object is relevant to all teacher preparation programs, the dean often articulated this mission in ways that were specific to the institutional context and culture of ECU as a large teacher preparation institution located in a community with particular needs. For example, she argued that institutional resources at ECU and similar institutions around the country are going to the wrong place—to "mediocre research done in service of faculty trying to publish and get tenure, when resources should be going to the practice of producing a large quantity of highly qualified new teachers." She "realized that we [ECU] had to create an identity. The identity isn't that we're better [than R1 institutions]… our identity would be strong. [R1s] would be important elements in a linked system, but we would be different… This is the place where teachers are made and if we're ever, ever, ever going to change the trajectory [of the profession], this is the place it has to happen" (Dean). She connected the object of data-informed program improvement to the larger objects of elevating the profession and providing communities with better prepared novice teachers.

There were many other examples of program members articulating individual and program goals in ways that echoed the dean's "persistent message" (Faculty/department chair) about using program data to consciously and continuously improve their programs. For

example, a faculty member commented: "Those were key things: helping our students affect student achievement early in their career, and then also in our teacher prep program, getting away from this one size fits all and really targeting needs." This faculty member articulated attending to the unique role that ECU plays in the communities they serve within the object of continuous program improvement. When asked about what program members were finding useful about using data to help inform individual and program decisions, another faculty member answered that the most important thing was to consider data in relation to program improvement towards the object of "[putting] the best teacher out there":

> When you see data, how is it in relation to program areas as far as quality improvement? The number one thing, the outcome, is trying to put the best teacher out there. That's the whole purpose of what we do and that's what we've been doing for over a hundred years successfully. But, we're using data now to really say: "okay, is it working?" The good news is we have the data. The not so good news is that we have the data. It really has been—I'm just being honest—it has exposed several holes that we have in our programs. It's also been nice to be able to see how it's tightened several of the different things that we're doing. (Faculty)

While it's likely that members of ECU's TEPs have always held preparing excellent novice teachers as a primary object, the integration of data use and data-informed program research as a key means to improve programs in ways that better serve novice teachers and the communities they serve was emergent. This new focus on data-informed program improvement was the result of both external pressures—such as new accreditation standards and the publication of new value-added state-level data—and the internal response to those pressures. This response was led by the dean's attempts at "using crises as opportunities" (Dean) to harness

program members' energy in ways that primarily served internal (i.e., program improvement) purposes, while simultaneously serving external accountability purposes. The dean played a significant role in developing and executing a comprehensive vision around data use, which involved "[carving] out a point of view, a purpose, a set of activities, goals, outcomes, and then [doing the work]" (Dean). The data use practices developed in this process were supported by a variety of tools, policies, and incentives. While many of these were developed on an ad hoc basis in the context of working a variety of problems related to systemic change, they were also guided by an exceptionally strong vision of how teacher education programs *should* operate in the current policy context.

A strong investment in program evaluation and assessment at ECU resulted in the development of both technical and conceptual resources that support data-informed program improvement efforts related to their educator preparation programs. The various data sources used by members of ECU's TEPs acted as important tools used to measure program outcomes and inform decisions made to improve programs. These data sources included candidate satisfaction surveys, relatively new state-level value-added data, edTPA scores and portfolio artifacts, and new internally developed course-level and program-level assessments. These new internal assessments were related to several program innovations originally sparked by their 2009 TQP grant. These innovations included the development and implementation of new curricula known as Instructional Strategy Lessons for Educators Series (ISLES) that taught and assessed 10 evidence-based "high leverage practices" that were embedded into introductory courses, methods courses, and advanced courses; Video Grand Rounds (VGR), in which teacher candidates viewed common video segments of teaching practice, completed structured classroom observation protocols, then debriefed with faculty regarding observations; co-teaching, in which

two or more teachers planned, delivered, and assessed classroom instruction collaboratively; and a new model for instructional coaching, in which coaches were hired from partnering school districts to mentor teacher candidates in best practices, conduct in-class observations, and provide targeted professional development. Data related to these program innovations included candidate data captured during the process (e.g., ISLES assessment outcomes) as well as faculty-led research related to each project implementation (e.g., as VGR was piloted in different programs, the efficacy of different pedagogical formats was investigated).

Technical supports included the acquisition and development of technology-based tools for collecting, archiving, and analyzing program data. These included both a university-wide "TracDat" database, and a commercial data platform for archiving and analyzing portfolio artifacts (Taskstream). An important feature of the technical development process was its strategic attention and response to faculty needs and interests. The dean felt strongly that the design and implementation of an accessible and useful data platform should serve not only collective program goals that might be performed primarily by administrators, such as accreditation reporting, but should also facilitate widespread faculty engagement in data use that might serve both individual goals (such as publication) and program goals (such as analyzing program outcome data to inform program improvement efforts).

The Office of Assessment and Accreditation was an important organizational resource created to support data use work in all 17 TEPs at ECU (including preparation programs in academic departments outside the COE). The office was formed to centralize data collection and reporting, and to support broad data access and use. The office had administrators and staff whose jobs involved leading data use work, managing program data from a variety of sources, leading reporting efforts such as accreditation reporting, and supporting faculty and other

program members' participation in individual or collaborative data use activities. Office staff spent considerable time analyzing and disaggregating large data sets in ways that facilitated faculty access and use of a variety of data sources and reduced faculty and staff workloads related to external reporting requirements. By taking significant responsibilities for data collection, management, and evaluation, the office freed up faculty to be able to participate in data use activities while still having time for their primary teaching and research responsibilities. As one administrator explained: "We get the teachers together. We facilitate that. We do all the paperwork around it… We see our job is to let the faculty teach." They also facilitated faculty engagement in data use and research on program practice by providing data sets and analyses to faculty upon request, and training faculty and program leaders to be able to find various types of program data "so that they would be able to be more self-sufficient and act on their own program data" (Program administrator).

These technical and professional supports for data collection and analysis made program outcome data more accessible, and programmatic strengths and weaknesses more visible to the faculty. Faculty spoke about how integrating data from various sources into one shared and electronically accessible data system led to more robust programmatic research and development. Office of Assessment and Accreditation staff played a key role in designing and organizing the data platform. The staff and administrators who oversaw the design and support for the data platform listened to faculty needs and continually revised the system and created new features based on those needs.

Various data sources were used as tools not only to evaluate and change program coursework and fieldwork, but also to shift organizational resources, policies, and divisions of labor to better support continued program improvement. For example, data were used to help

allocate existing resources and secure additional resources and funding. As data-related projects evolved, program members drew on available data in requests for resources and funding from program leadership: "By having the data, by having the conversation… then the dean is willing in most cases if it's valid and sound to [provide] one time funds for [projects] and/or reoccurring funds" (Program administrator). Many of the resources employed for various data use initiatives came from the TQP grant. Program leaders also spoke about plans to use program outcome data to secure additional resources and grants to support programs, continue data use work, and "try to build on the culture of research and data that has been developing here" (Program administrator).

There were also conceptual tools that were important to the data use work at ECU. The most comprehensive example of this is the conceptual framework known as the "Pirate Code" (the ECU mascot is a pirate). This conceptual framework was developed as a way of articulating both the individual components of the college assessment and program development agenda, but also the way in which those components exist in functional relation to one another. The assessment director explained what she and another program administrator were aiming to create when they made the first version of the Pirate Code for their NCATE Transformation Initiative (TI) proposal:

> What we wanted to do was get to this idea of the continuum of developing expertise… Then all these different initiatives, they should thread or knit together across the scope of the curriculum to yield a better prepared beginning teacher or a well-started beginning teacher who's really ready to go into a classroom and have a positive impact right away.

The Pirate Code framework conceptually connects different initiatives, such as co-teaching and Video Grand Rounds and edTPA, into a comprehensive "R and D [research and

development] model" (Assessment director) for inquiry-based program improvement. While it originally focused on the elementary and middle grades programs and the innovations they were implementing, "the initiatives that are part of the TI… cut across so many departments now and programs; edTPA is in all programs" (Assessment director). The model, and the initiatives that were part of it, has expanded into programs both within and outside the COE.

They also developed a new protocol to organize, support, carry out, and evaluate each Pirate Code project. Figure 3 describes this protocol: the first phase is the "squishy pilot", or informal, phase of an innovation. During the next phase, generally implemented the next semester, the "squishy pilot" becomes a formal pilot and the faculty team—aided by educational researchers, the associate dean for research, and others—formalizes the pilot and submits a plan to the Institutional Review Board (IRB) for approval. In the third phase, data are collected, organized, and analyzed. If the data analysis suggests that the innovation is improving the program(s) and if it seems to be a sustainable innovation (they have enough resources to support it), it moves on to the fourth phase, where the innovation is expanded into other courses or programs. In the fifth phase, data analysis efforts are presented at national conferences and written up for publication. In the sixth and final phase, innovations are embedded in the program(s) and program members continue meeting to look at data across projects and continually assess program outcomes.

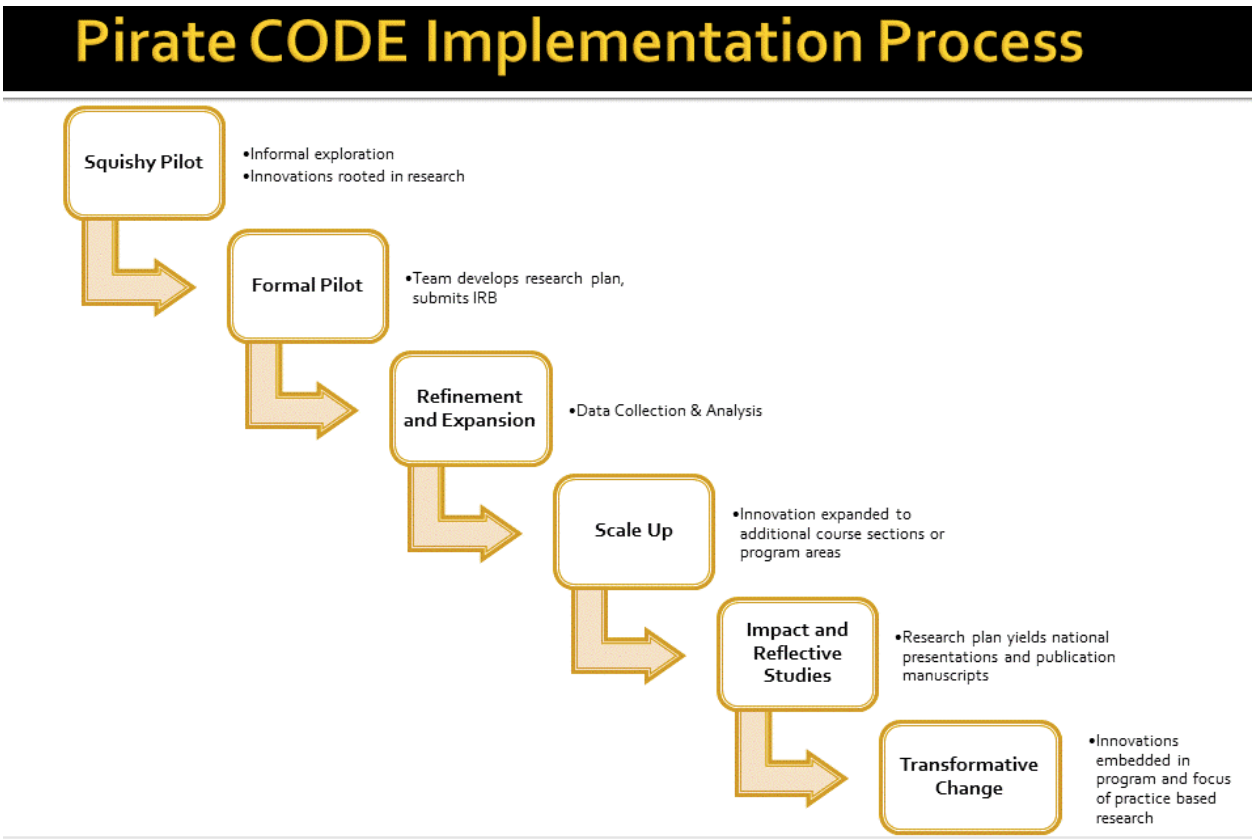

Figure 3: ECU's Pirate Code implementation process

Another protocol developed to support successful data-informed innovations and their expansion was the Memorandum of Understanding (MOUs). The MOUs were formal agreements about how the innovations were going to be implemented and evaluated. The assessment director explained:

> Each one of those [Pirate Code] projects has a group of faculty that's leading it. Each one of them has a work scope, the faculty that are going to be on board, the resources that might be needed, needed training resources, tasks, but it also includes … more importantly, what are the actual outcomes for that project?

The MOU protocol they developed was a tool to help them scale up because they "learned through the years that you've got to have some structures, some system in place for expanding

out" (Faculty/program administrator). The MOUs helped them "institutionalize" innovations in a way that maintained the integrity of their research and development model:

> The MOU is designed to keep us all on track about… who is here with Video Grand Rounds or edTPA is in agreement about what we're all doing about this. There's some, maybe a little wiggle room in there, but we're keeping it all together.… The dean said to me as we've been talking about this that if someone wants to go off and do something else, that they're going off and doing something else on their own, that the support that she's providing through her buy back or [grant] dollars is going to support the projects that are linked to these research-based models… For example, history ed wanted to look at Video Grand Rounds, but didn't want to do the model. I said okay, what are we going to do there? Well, then we can't provide any buy out time to support Video Grand Rounds in history ed because you're off-model. In terms of policies being developed and money funding the different projects, we really try to stick with that. I think that's a way of keeping people together. It's not to say that you can't go off and do your individual innovation, but really, if you— if the dean ended up supporting that, it would go against her statements about how we can innovate and what we can institutionalize. (Assessment director)

Part of the purpose of laying out these details was to help institutionalize innovations in a way that balanced adaptation and consistency in the implementation ("there's… a little wiggle room in there, but we're keeping it all together"). In order to innovate and institutionalize within the research and development model, the dean and other program leaders developed ways to "support the projects that are linked to these research-based models" with faculty buy out or grant dollars. Though programs implementing Pirate Code projects in the scale up phase were

asked not to stray too far from how the innovations have been implemented in other programs for research and evaluation purposes, a faculty member explained that the model does evolve over time based on "a refinement reiteration process" that used data to evaluate and improve innovations and their implementation.

Program Culture and Faculty Engagement. In order to work towards the object of data-informed program improvement in an organization that is a practice-oriented producer of a large number of new teachers every year—despite the fact that "reappointments and tenure and the structure looked the same [as an R1 institution]"—the dean identified the need to make changes to the culture and structure of the institution. In part this required providing faculty with opportunities and support for getting their scholarship from their practice in ways that could potentially inform program improvement. The dean articulated her own role in this project: "The deanship here has to be about convergence, has to be about bringing faculty together around program improvement." Faculty engagement and collaboration were an integral part of her strategy to institutionalize data-informed program improvement, and she and others instituted policies, practices, and incentives to encourage or require participation in data use activities.

An important part of motivating faculty to participate in work oriented toward collective (rather than individual) goals was shifting formal job expectations to make time and space for this collective work. For example, the dean changed faculty workload expectations so that they taught fewer classes but were also involved in "college-level initiatives":

> Speaker 3: Two years ago we taught four classes a semester, and last year we started teaching three classes a semester. Part of that commitment from the dean was that faculty would be involved in college-level initiatives…

> Speaker 1: The dean did [that]. It's really a very powerful move. (Program administrators; Focus group)

This shift in faculty workload expectations was referred to as the addition of a "fourth box":

> There's also a shift in how we look at faculty workload and that expectation of this "fourth box." You are providing service back to the program, to the university. You can't just operate within your own specific research project. There's this greater contribution. (Faculty/program administrator)

Other kinds of workload adjustments were also made to support the work of inquiry, data use and program improvement. For example, supervisor workloads were adjusted to allow them to participate in scoring edTPA portfolios. The COE also hired more supervisors so that each supervisor could carry a smaller load for supervision and scoring.

These new expectations to participate in "this greater contribution" were also incorporated into faculty and supervisor evaluations. While the structure of the evaluations hadn't changed, the "things [that] were written into the evaluation… for example if they scored edTPAs or not… [were] put in the evaluation showing that those were the things that are valued from the person that evaluated you" (Program administrator). She added: "There is some other stuff, like I was able to turn in names for raises this year and that was typically people that were involved or people that are working on [program or college-level projects] that are going to rise at the top" (Program administrator). Several faculty commented on the importance of these college policies and supports in their efforts to manage the tensions between the individual requirements for promotion and tenure, and the needs for a collective commitment to program improvement. The direct support of faculty research on program improvement issues also extended to teacher education programs located outside the COE.

In addition to encouraging individual faculty research using data for program improvement purposes, program leaders also planned and implemented collaborative data analysis and interpretation activities that enabled faculty to make sense of the data collaboratively and use the data in the context of program decisions. ECU administrative leaders were strategic in recruiting and supporting faculty from the college, and from teacher education programs across the campus, to participate in designing and carrying out a variety of program assessment and evaluation functions. This participation happened in the context of a variety of collaborative structures created or modified to encourage faculty engagement in data use initiatives and facilitate collaborative data use work. I provide a few examples of the types of collaboration these structures fostered below. For a complete list of collaborative structures at ECU, see Appendix D.

"Data summits" were planned periodically to report on and evaluate progress on college pilot studies, and to present and interpret various program comparison reports (some based on local data, others grounded in state or national databases). The agenda for each data summit was carefully planned and orchestrated to achieve a variety of goals, including making the history and trajectory of the work transparent for faculty from across the university, providing opportunities for faculty to give feedback and make decisions about program operations, supporting faculty and staff participation in data analysis and program decision making, and developing data use skills for faculty to bring to their own programs and their own research and teaching. Program leaders prepared the data sets to make the faculty's task of interpreting the data more manageable, and continually positioned faculty to make the programmatic decisions.

The assessment director talked about various ways she and other leaders tried to use data summits to develop faculty's data literacy so they could do more data analysis work within their

own programs, such as training them in the Data Wise habits of mind and approach, and leading them in data analysis activities that they could emulate within their own programs. In part this emphasis on developing faculty's expertise in data use was motivated by a desire to slowly and strategically shift the division of labor such that faculty could take on more data analysis within their own programs and other collaborative groups, and thus allow Office of Assessment and Accreditation staff and administrators more time and resources for other data use projects and support.

The assessment director, who facilitated the data summits, spoke about focusing on unit-level data (data that affected all TEPs) during a 2014 data summit since faculty would have other opportunities to focus on data and questions specific to their programs or courses. This strategy was in part inspired by what she'd learned from the previous year's data summit:

> At last year's data summit, we started off the first part of the day with all the unit data, and then I gave everybody the program data. There was something about the energy that just dissipated after I gave out the program data. Everybody went into their silo. Like, math's over here, and elementary folks are over here. I don't really want that to happen again this year. I feel like that needs to happen on their own time and space, and our office [Office of Assessment and Accreditation] should be a partner in that, and help prepare the data. (Assessment director)

She went on to explain that "there's a nice flexibility in individual opportunities within each program to address certain things, but there's a lot of power within the unit, to be able to enact some kind of change across all of our programs" (Assessment director). The data summits were key opportunities to focus on collective practice, program improvement, and unit-level discussions and decision making.

The dean played a key role in fostering different types of collaborative structures designed to encourage more faculty to get involved with data use in service of program improvement goals. She developed what they termed "research communities of practice" (RCoPs) that facilitated cross-role collaboration based on faculty interests and participation in various college or program-level innovations. These RCoPs were designed deliberately to foster "research wrapped around [their] teaching and [their] programming" (Dean) and contribute to program improvement.

Many of these new RCoPs were formed with the more specific goal of evaluating and improving individual innovations, such as edTPA, co-teaching, or their new curriculum innovation known as "ISLES". Other RCoPs were based on other faculty interests relevant to teacher education, such as distance learning (also relevant to their new online courses). Program staff and administrators, particularly those affiliated with the Office of Assessment and Accreditation, played a role in introducing faculty to RCoPs and encouraging participation in existing RCoPs or the creation of new ones. Staff and administrators from the Office of Assessment and Accreditation also help RCoPs find and access relevant program data so that they can execute "studies that… would benefit the college" (Program administrator).

The goal of these RCoPs was to increase collaborative research by moving from "individual faculty silos" to collaboratively addressing some "enduring dilemmas" in teacher education in order to "really contribute to the knowledge base in a much more systematic, important way" (Faculty/department chair). Numerous informants described the dean's vision as the impetus for the creation of the RCoPs, and the more collaborative, research-oriented organizational culture developing at ECU.

Increased emphasis on and financial support for conference participation also enhanced within- and cross-program research. For example, a faculty member talked about how she was working on an AACTE presentation with two other faculty members in different departments, looking at student feedback and perceptions about edTPA at different times during their programs. There were many other examples of faculty individually and (more often) collaboratively developing conference proposals and presentations using program data. In some cases, faculty collaborated with people from other universities on conference proceedings. These increased conference presentations and publications that came out of programmatic data use and research became a part of program members' sense of program identity and pride:

> We'd gone from having maybe two or three proposals accepted at AACTE, which is a good forum for us to share our work, to I think we have eight of them this year. It's kind of a point and pride for us, to be able to talk about what we're doing in our program. (Program administrator)

Conference attendance was part of the "work for the good of the cause" (Program administrator)—in other words, object-oriented collective work—that was supported financially by program leaders. As the various collaborative research initiatives using program data progressed and conference attendance was supported financially, another outcome was raising the caliber of conference presentations and journal publications. As a program administrator stated:

> What I do see changing is that the publications and the conferences that the faculty are shooting for are higher. The standard [for publication for promotion and tenure] might be the same, but I think the quality, what people are going to be putting in those boxes is going to be a higher quality… I think some of the conversations about [publications and

> conferences] have changed to a different level. The journals that [faculty] are shooting for, they're talking about different journals and really thinking about how journals are tiered across the college and tiered within our content areas so that they're moving up in that way.

This change was attributed in large part to the cultural shifts encouraging collaborative research and development.

There was plentiful evidence that characteristics of the activity system's community, including the values and beliefs of program members, had evolved over several years both prior to and during our data collection. As more program members became involved in the process of data use—some more willingly than others—most began to value the information and learning opportunities presented by new data sources and programmatic research. Once faculty began noticing "the opportunities for research around practice that are there," more faculty and more programs joined different data use-related projects. In this example, the dean described how more programs joined in using edTPA once they began to see the individual and collective benefits of having performance assessment data:

> The middle grades [who first piloted edTPA]… they came kicking and screaming, but now they're the champions. They see the value of TPA. They recognize what it's beginning to do, not only for program improvement, but they now see the opportunities for research around practice that are there. So last year, elementary and special education came on board, so last year we did about 400 students. We went from, like, 50 students to 400; it was a huge scale up. We had English and history and middle grades in the first round. Elementary and special ed joined this year. Now there are conversations this summer with business ed, music, math, and science. (Dean)

Once people began to see positive outcomes related to both individual motives (e.g., individual research and teaching) and collective motives (e.g., program improvement), the perceived value of data-related initiatives increased, along with individual and program participation.

The community also saw a shift in values towards collaboration and a sense of shared responsibility for data use and program outcomes. An administrator reported a shift towards "more ownership of the data":

> We're shifting. We've gone from running the reports and people saying, "That's not right. Somebody needs to fix it," to "It's not right. How do we fix this?" They see the data is more valuable to them, so there's more ownership of the data and more reason for them to take care of it and kind of tend the garden a little bit, instead of just saying, "That's somebody else's responsibility."

This excerpt suggests that faculty were increasingly sharing responsibility and "care of [data]" because they see the value of the data.

The evidence also suggested that program members felt an increased sense of shared responsibility amongst themselves for program outcomes. As one faculty member put it, "We're in this together. Everyone brings something to the table." Three faculty members and administrators in a focus group spoke about how collaborating with each other and with other faculty on a research and the publication process had been a better experience than ever that year. When asked why, they responded:

> Speaker 1: We were all invested in it.
>
> Speaker 2: Everybody did their part…
>
> Speaker 3: I think it was the camaraderie too because we were all accountable.
>
> Interviewer: Accountable to whom?

Speaker 3: To each other…

Speaker 1: It was like we gave each other permission to do it [in our own way]…

Speaker 2: Somehow or another the support structure we had surrounding us made it happen too. (Faculty/Program administrators)

The increased collaboration, supported by numerous new collaborative structures and changes to the formal and informal "rules" of the activity system, shifted community norms and values towards shared responsibility for collective goals and outcomes.

The evidence also indicated a shift towards collaborative inquiry and shared responsibility with other institutions both within and outside North Carolina. A faculty member and administrator said:

> But we're connecting people in different program areas to other people in the other institutions. This is the first time in the 15 years that I've been in North Carolina, 16 now, that we're doing cross-institutional discussions and research. It kind of happened with people in the middle school, but now we're doing it through TPAs an other [projects]. It's pretty cool. I think that's a big thing that people are seeing that they're not the only ones, so I think there's a momentum that way; they don't feel alone, in particular in a lot of small programs.

In addition to not "[feeling] alone," faculty and administrators in one focus group talked about the role of edTPA in fostering within and cross-state collaborations that "brought a different perspective" to their work.

Through collaborations related to new sources of data and forms of programmatic research, the ECU community involved in the work towards data-informed program improvement expanded to include expertise from others outside ECU. Another example of this

was collaboration (primarily through a consortium of college-level deans) around new state-wide value added data and attempts to both make sense of what the data meant and also to make the data more useful by advocating for additional drill-down data analyses. ECU programs also gained visibility and opportunities for cross-institutional collaboration through conference presentations, publication of their research, and participation in national projects such as edTPA.

A relatively recent (since about 2009), strong organizational investment in program assessment, innovation, and evidence-based evaluation at ECU resulted in a variety of changes in program policies, curricula, and instructional practices. These included changes to individual course and fieldwork curricula; changes to program-wide curricula, structures, and policies (e.g., the integration of ISLES across the curriculum in several programs); the creation and integration of new internally created sources of evidence (e.g., video evidence associated with Video Grand Rounds); the adoption and use of external sources of evidence (e.g., edTPA; state-level value-added data) the creation and integration of several new collaborative structures to facilitate programmatic research and development (e.g., research communities of practice; see Appendix D for a list of collaborative structures at ECU); the creation of conceptual tools to integrate the many program innovations (e.g., Pirate Code) and practical tools to ensure a balance of programmatic agency and continuity in the implementation process across many different programs (e.g., "squishy pilot" implementation protocol; MOUs); and the development of a data platform that was created and updated based on the feedback and needs of program members.

These program changes were facilitated by contextual and organizational factors, such as their large size; wide variety of programs housed both within and outside the COE; commitment to providing higher education opportunities to underserved populations, particularly in eastern North Carolina; and mission and history as the primary producer of new teachers in their region.

These changes were also affected by the interaction of many new and evolving organizational and interpersonal norms, policies, resources, and tools. In Table 2, I summarize several important organizational outcomes related to data use, and describe how these outcomes were supported and orchestrated by organizational and interpersonal characteristics and practices. The table highlights that these organizational supports were not merely static characteristics of one node of the activity system. Instead, the orchestration of object-oriented organizational change requires attention to how different aspects and practices within the activity system interrelate and interact together. These themes, and the relationships and interactions among different organizational and interpersonal supports and resources, will be explored in further detail, and in light of additional theoretical perspectives, in Chapters 6 and 7.

Table 2: *ECU activity system supports and interactions*

Organizational Outcomes	Activity System Supports & Interactions
Development or evolution of data use practices aimed at the object of data-informed program improvement	Program leaders explicitly connected programmatic research and data use activities to the college's history as a large regional producer of new teachers and its mission to serve the region's P-12 population with excellent, well-prepared novice teachers *(Community/Object)* Program leaders tried to leverage policy changes and increased data sources (including externally controlled sources such as state-level value-added data) for program improvement goals *(Community/Rules/Object)* Large TQP grant used to develop new sources of evidence and foster programmatic innovation, research, and evaluation *(Rules/Tools)* Many data sources available for use by all community members, including internal data (e.g., ISLES assessments, candidate satisfaction surveys), state-level value-added data, and edTPA *(Tools/DOL/Rules)* Office of Assessment and Accreditation staff analyzed data

	sets to facilitate easier faculty access to data and decrease faculty workloads related to external reporting *(Tools/Division of Labor (DOL))* COE invested in technical tools/data platforms (TrackDat & Taskstream) that were developed and continually evaluated and revised with faculty input and provide widespread access for program members *(Tools/Rules/Community)* The conceptual tool Pirate Code integrated many different program innovations and projects and articulates the relationship between programmatic research and data use and goals related to preparing excellent novice teachers *(Tools/Rules/Object)* Program leaders created tools, procedures, and protocols to guide the implementation and evaluation of Pirate Code innovations/projects across several developmental stages and across their many TEPs *(Tools/Rules)* TQP grant and TPAC participation increased national visibility *(Tools/Community)* Data became increasingly integral to decision making related to program improvement *(Tools/Rules/Object)*
The COE demonstrated a collective sense of internal accountability	Strong state accountability context required an increased emphasis on evidence, program outcomes, and data-based decision making; program leaders use this "crisis as an opportunity" to further programmatic goals *(Rules/Object)* Program leaders explicitly connected data use activities to the college's mission to serve the region's P-12 population with excellent, well-prepared novice teachers *(Community/Object)* Program leaders tried to leverage policy changes and increased data sources (including externally controlled sources such as state-level value-added data) for program improvement goals *(Community/Rules/Object)* Program leaders leveraged attention to data-based accountability to acquire additional resources for TEPs to further programmatic goals (e.g., TQP grant) *(Tools/Rules/DOL)* Program members spoke about the object of student and program learning and improvement as more important than complying with external accountability policies and standards *(Object/Community)* The college mission to serve the region's P-12 population

	with excellent, well-prepared novice teachers guided the development of programmatic research and development *(Object/Rules)* The organizational goals around programmatic research and development guided the creation and adoption of tools to assess student outcomes *(Rules/Tools/Object)* Program leaders organized data use activities primarily for internal (inquiry & program improvement) purposes over external (compliance & external accountability) purposes *(Community/Rules)* College/program administrators and staff completed large amounts of the work necessary to comply with external accountability policies (e.g., accreditation reporting) while making time and space for *all* program members to participate in collaborative data use activities that primarily served internal program improvement goals *(DOL/Rules/Object)*
Extensive collaborative data use both within and across 17 TEPs that engaged all program members (faculty, supervisors, staff, administrators)	Various formal collaborative structures (e.g., research communities of practice, data summits) provided time and space for collaborative inquiry aimed at program development and evaluation *(Rules/Object)* All program members (faculty, supervisors, staff, and administrators) were involved in collaborative data use through at least some of these collaborative structures (e.g., many data summits included program members who represented different programmatic roles) *(Community/Rules/DOL)* Assessment tools that covered curriculum across course boundaries (e.g., ISLES, edTPA) fostered a common language of practice for program members *(Tools/Community)* Collaborative data use practices using common assessment tools (e.g., all program members expected to score edTPA) fostered a common language of practice for program members *(Tools/Rules/DOL/Community)* Program leaders strategically prepared data sets relevant across programs for data summits to facilitate collaborative data use practices *(Tools/Rules/DOL)* The dean's consortium related to value-added data increased inter-university collaboration *(Tools/Community)* Shifts occurred in faculty workload and expectations to include data use as "providing service back to the program"

	(Rules/DOL/Object) Increased support from program members for programmatic research and development aimed at data-informed program improvement *(Community/Object)* Increased community value and cultural norms around collaboration *(Community/Rules)* Most individual and program data were available to all faculty through electronic data platforms adapted to fit specific institutional needs *(Tools/DOL)* Program members collaborated with faculty and staff from other TEPs on data use activities, often through established collaborative structures (e.g., research communities of practice) *(DOL/Community/Rules)* As additional program innovations began (e.g., co-teaching) and/or assessments incorporated into the curriculum (e.g., edTPA), new collaborative structures and groups formed to evaluate the projects and assessment results and make decisions about whether and how to continue and/or scale up innovations in ways that improved programs *(Rules/Tools/Object)*
A growing collective sense of faculty agency, including faculty input in programmatic decision-making	Some faculty increased their visibility within their departments because of their work with edTPA *(Tools/Community)* There was evidence of program members using dissent as a resource in the change process *(Rules/Community)* Program leaders encouraged a shift from compliance to inquiry orientation related to data use for program improvement *(Community/Object)* Program leaders positioned faculty to make or have input in programmatic decisions *(Rules/Community/DOL)* Increased opportunities for faculty voice and decision making through new collaborative structures aimed at providing time and space for programmatic research and data-based evaluation *(Rules/DOL/Community)*
A growing sense of shared responsibility for student and program outcomes amongst program members, both within and across 17 TEPs	Program members had a shared commitment to improving student and program outcomes *(Object/Community)* Pirate Code provided a common conceptual framework for programmatic research and development, and guided the sources of evidence that would help program members' data analysis and program evaluation activities

	(Tools/Rules/Object) Program members participated in the creation and/or evolution of many of the program innovations/pilot projects, as well as the development of research evaluating those projects/pilots *(Tools/Rules/DOL)* Program members participated in the implementation process and evaluation of assessments (e.g., ISLES assessments; edTPA), with the expectation that the evidence they produced would be used towards program improvement goals *(Tools/Rules/DOL)* EdTPA measured students' performance and development outside of individual course or fieldwork structures and thus reflects on the curriculum as a whole *(Rules/Object)* The ISLES curriculum and associated assessments were developed and implemented across program curricula *(Tools/Rules/DOL)* There was a growing cultural expectation and belief that program members together, not just individually, are responsible for student outcomes *(Community/DOL/Object)* Program leaders created new positions to distribute expertise and leadership to contribute to data-informed program improvement efforts (e.g., making a faculty member TPA coordinator; enlisting faculty from other departments with research expertise to assist program research efforts) *(DOL/Rules/Community)* All program members had access to various types of student and program outcome data via electronic data platforms *(Tools/Rules)*

University of California, Santa Barbara

Context. University of California, Santa Barbara (UCSB) is one of ten campuses of California's large public research university system. While the university itself is quite large (20,000 students and 1,000 faculty), the Teacher Education Program (TEP), housed in the Graduate School of Education, is relatively small (75 to 115 candidates per year). The TEP is a 13-month post-baccalaureate program that offers graduate students a California teaching

credential in either elementary (known as "Multiple Subject" or MST), secondary (known as "Single Subject" or SST), or special education, and an optional Master's degree in education. At the time of our data collection, the program had 35 to 40 faculty with part-time roles, and was comprised of approximately 40% tenure-track faculty, 20% doctoral students, and 40% instructional and supervisory adjuncts.

UCSB is a research-intensive university, which means that TEP experienced challenges particular to that culture, including research faculty engagement, the need for adjunct practitioner faculty, and issues related to power and status differences between groups of faculty whose work is valued differently within and outside the program. The primary mission of the Graduate School of Education "derives from the overall mission of the University of California, which is to conduct research to address major challenges confronting the State, as well as to provide outstanding education for its students" (https://education.ucsb.edu/about/mission-history). Their mission is further described as threefold: first, to conduct scholarly inquiry into education; second, to educate scholar researchers and scholar practitioners; and third, develop and maintain exemplary programs that serve as models for teaching, research, and service. This primary focus on research meant that in some ways the work of TEP and TEP faculty were not as valued by the larger institution as more research oriented programs and faculty.

The dean of the School of Education (SOE) discussed how the status of TEP had improved over the past few years due to a number of factors, including participation and leadership in the UC-wide science and math initiative that created the newest undergraduate minor, the science and math education minor; faculty and program leaders seeking grant funds; and the community outreach TEP provided. In describing the relationship between TEP and the larger university, the dean explained that "UCSB feels very overtly, if the chancellor was here I

think he would say it, that we provide the most positive face of UCSB to our regional community," in part because of "the positive connections with superintendents and with the elected officials because they noticed that the science and math initiative has given us a lot of publicity."

For the last several years the dean had worked to move TEP into the Department of Education. One of the benefits of this move was that it brought teacher education to "the center of [the department's] work" (Dean) and elevated the status of TEP and the TEP Director position. In addition, this change brought teacher education practitioners and research faculty into closer collaboration to help further "a commitment to an evidence-based database, scholarly based teacher ed program" that was already in place (Dean). At the time of the first site visit, 50% of the Department of Education's ladder faculty were teaching in TEP.

When asked about the national policy context for teacher education, the dean said that her "general position is come on, come on, come look at us." However, she also explained that California did not have the data system in place to easily implement value added measures. She stated that, "I actually have confidence in our students and if it comes to that, we'll jump in and do whatever we can." In terms of the state policy context, the dean and TEP director also discussed the need to respond to recent changes to the state accreditation system and changes to K-12 policy, including the Common Core and next generation science standards.

At the state level, teacher candidates for multiple subject (elementary) and single subject (secondary) teaching credentials have been required by California statute to pass a state-approved performance assessment that aligns with and assesses competence in California's Teaching Performance Expectations (TPEs) since July 2008 (http://www.ctc.ca.gov/educator-prep/TPA.html). UCSB had a long history of participation with the Performance Assessment for

California Teachers (PACT). They were one of the 12 institutions participating in the PACT Consortium, formed in 2001, that created and piloted PACT. This experience, in the words of a faculty member, "[threw] a national perspective on the work we were doing" (Faculty). They have been implementing PACT ever since. However, during the first year of our data collection, the program decided to voluntarily pilot edTPA and was in the midst of getting ready to implement edTPA during the second year of data collection. PACT and edTPA are similar portfolio-based teaching performance assessments which require candidates to create a portfolio of teaching artifacts and commentaries. EdTPA was approved as a teaching performance assessment option for multiple and single subject (secondary) teacher education programs in California in August 2014.

Organizational Supports for Data Use Practices and Processes. Faculty, supervisors, and administrators at UCSB discussed using several data sources in their data use activities, including employer and candidate satisfaction surveys, course evaluations, student teaching evaluations from supervisors and cooperating teachers, video data taken during student teaching, MEd portfolios (an internally-created assessment only for those candidates who chose to pursue a Master's degree in addition to a teaching credential), and PACT scores and artifacts. The TEP director explained that the qualitative data that PACT provides had generally been more useful for engaging faculty and making programmatic changes than the quantitative data she engaged with for accreditation reports. PACT data was by far the most discussed data source among faculty, supervisors, and program administrators we interviewed. Part of the reason program members found PACT data so useful was that it offered different levels of data to explore:

> I think the most important data that we use is data ... at the level of student documents. That's particularly where PACT has been useful for a number of reasons. One is that it

> does provide different levels of data that we can access. We can look at the overall pass rates, then we can look at the scores by rubric and get a sense of what's happening there. Then we can decide what documents we want to look at and what people might want to focus on. (TEP Director)

The TEP director explained that a common practice with PACT data was to look at the scores to see trends that could help guide faculty's further exploration of a specific issue by looking at candidate work. In this sense PACT data provided a large program view, with "those numbers opening up an opportunity for us to go and look really closely at more kinds of qualitative data and have those conversations" (Faculty/Program Coordinator). PACT's particular affordances, including the different types of both quantitative and qualitative data it provided, facilitated increased faculty engagement in conversations about the relationship between evidence and program improvement.

Scoring PACT internally became an important practice that engaged all faculty in data use processes and conversations. Our data indicated that despite the time commitment scoring entailed, faculty, supervisors, and administrators all valued the scoring process because it provided an opportunity to learn about the framework and allowed participants access to a detailed slice of the data. In the typical PACT scoring and data use process, candidates completed PACT and almost all faculty (with the possible exception of a couple research faculty) scored about three candidate portfolios. Scorers had one full day where they calibrated scores using some common samples that weren't from their program, then over the next two days they scored a sample of the program's own candidate work. They come back the next day to calibrate again in smaller groups before officially scoring the PACT portfolios they'd been assigned.

Scheduling intentional time for scoring and collaborative data analysis motivated faculty to participate:

> The space is created for us to do this work. I think because [the TEP director] approaches it as "What can we learn from this?" we all have an eye towards: aside from scores, what do our candidates do well? What do they not do well? And then we always get a chance to process the scores at another retreat, so it's like we're all into it together, which feels really good. Most of the people would say, "oh, it's so time consuming." Almost everybody says at the end, "but I learned so much." (Faculty)

In order to support this new division of labor in which nearly all faculty scored at least three PACT assessments, program leaders adjusted the program and workload expectations. Most normal activities were suspended for the week scoring took place: supervisors were not expected to go out to classrooms and faculty were not expected to hold classes. Scoring also became a job expectation that was "written right in [their job descriptions] that they'll be scoring PACT whether they are teaching one course or seven" (TEP Director). The program tried to keep the time burden of scoring manageable by only expecting faculty to score three assessments; if faculty scored more than three the TEP Director found resources to provide them with additional funding. Another way she kept individual scoring loads manageable was by enlisting the help of graduate students, who received a small amount of credit for their participation.

The PACT coordinator, a position created during the PACT implementation process, played an important role in the collection, analysis, and distribution of PACT data. After scoring was complete, the PACT coordinator pulled quantitative and qualitative data from the online scoring platform and analyzed and compiled the data into spreadsheets and various

representations (e.g., charts and graphs). These digestible representations of the data (e.g., average scores; longitudinal comparisons within and across subject areas) were then emailed to all faculty, including ladder faculty from the education departments who worked in TEP but weren't always involved with scoring. They would also be presented to program members during faculty and program meetings and data retreats as "starting points for discussions about what they are doing well or not" (PACT Coordinator). The TEP director and PACT coordinator shared primary, though not exclusive, responsibility for curating the data for collaborative data use activities in program meetings and data retreats.

Program Culture and Faculty Engagement. The PACT data use process highlights the strong inquiry orientation that permeated the program culture around data use. Program administrators, faculty, and supervisors all approached data use activities with a "What can we learn from this?" lens, as a faculty member commented above. Program members shared a strong, cohesive vision of program goals; their data use activities and the program changes that resulted from that work were all oriented around making sure they were graduating the strongest teacher candidates possible. Program members used data both to try to improve individual practice (e.g., individual instructional or supervisory practice), and also to meet collective goals (e.g, make sure that candidates' experience through the whole program sequence helps them learn to be the best possible teachers). The data use activities both illuminated the object for individuals and the collective, and also refined the goals over time. One supervisor articulated this as a shared goal amongst program members to grow and change the program: "I think we are very proactive and pro-growth and want to keep up and improve this entire program. We're not stagnant in any way. I just feel like we're always looking for improvement. That's the key."

Data-informed program improvement had, over time and largely related to their implementation and use of PACT, become an important object for program members.

As scoring PACT (now edTPA) evolved into a longstanding program tradition, it became increasingly tied with the ultimate object of preparing excellent novice teachers and increasingly part of the program culture. This sense that scoring was a regularized part of the processes responsible for program improvement fostered continued faculty engagement:

> I think that what keeps people engaged is that it's just a practice of the program for one. Now it's just commonplace. It's what we do, but the other part of it is that it is part of our conversations that we have. People believe, see the value of seeing the fruits of their labor as they are integrated across more authentic teaching. (TEP Director)

Faculty and supervisors we interviewed spoke of scoring as a valuable practice both for themselves individually and for the program collectively. At an individual level, faculty were expected to incorporate the PACT (now edTPA) framework into their practice, and to use PACT/edTPA results to assess whether they had achieved their goals. Scoring became such a valued tradition that even though Pearson began requiring external scoring of edTPA[2], the program opted to continue doing internal scoring (in addition to external scoring) voluntarily. When asked why she would want to continue scoring edTPA voluntarily despite the steep time commitment, one faculty member responded: "There's one very big reason and that's just to know where the students are… For me to make improvements in my course every year, one of the ways I count on is PACT." Faculty and supervisors spoke about how having access to candidate artifacts during the scoring process and data retreats, in addition to the collaboration

[2] The Stanford Center for Assessment, Learning and Equity (SCALE) is the lead developer for edTPA, and Stanford University is the sole owner of edTPA. The university has an agreement with Evaluation Systems, a unit of Pearson, licensing it to administer and distribute edTPA. Pearson is doing the external scoring for the edTPA.

with colleagues that the scoring process entailed (including calibration activities), were learning opportunities that they valued and wished to continue.

At a programmatic level, PACT increased faculty collaboration in evidence-based decision making about program improvement. Scoring was viewed not as an isolated activity, but rather as an "opportunity to talk" (TEP Director). During data retreats, faculty and supervisors collaboratively decided which areas warranted attention based on the data. The TEP director, who facilitated these retreats, helped determine an action plan for the areas that faculty had identified that needed further attention. However, faculty were given a lot of agency in deciding not only what areas to focus on, but also how to address issues that came up. These focal areas were returned to both formally through meetings and retreats, and also through informal faculty collaboration. For example, many faculty-initiated, voluntary committees sprang up to address issues that had come up during data retreats. One example, described in more detail later, was a committee formed to create a universal lesson plan template to provide more consistency across coursework and fieldwork.

When program members queried the data to try to learn how to improve individual and collective practice, they did so with a "flexibility of purpose" that allowed them not just to solve existing problems of practice, but also to question their assumptions about those problems and potentially reformulate the original problem. In this way the program's data use processes involved "genuine inquiry":

> In any program, our program included... they use data to solve problems—are we doing good?—to measure your progress in solving the problem. But here that same data might get used to reformulate the original problem. Then you might say, wait a second, whether or not we're solving the problem, is that the right problem? That's great. That's

> exciting. It means that it's animating. That makes it come alive… I think I would frame it as genuine inquiry… What drives it is the pursuit of solutions to real problems of teacher preparation. (Faculty)

Several faculty members and supervisors attributed the way the program valued growth and change, and the way it used data as a tool towards program improvement, to the TEP director's leadership. Under her leadership, program members engaged in collaboration around a "common goal" to "do a better job with our candidates" (Supervisor). This collaboration between faculty, supervisors, and staff towards a common goal resulted in changes that program members had input in because the TEP director strategically distributed leadership responsibilities among program members. Many faculty and staff spoke about the ways in which both program leaders and colleagues honored and valued the expertise each individual brought to the program. Faculty spoke about how this created a "level of trust" in the program, and a sense of agency. One faculty explained, "I feel fully trusted by [the program coordinator] and [the program director] with what I do, so it allows me to be creative with what I do that moves beyond boundaries." Another faculty member echoed this sentiment:

> It always seems as though everybody is an expert, as [the TEP director] says, everybody's an expert at something. She gives us opportunities to create and move forward in the program. It never feels like the energy of the program is static. It's always moving towards something else.

The TEP director explained in an interview that an important aspect of facilitating faculty engagement in data-based decision making is capitalizing on the "collective knowledge" and expertise that other faculty, supervisors, and staff bring to the program. She further explained that a lot of the changes that get made in the program "are not changes that I made, they're

changes that I helped facilitate where the faculty was seeing a difference in what they wanted to make."

Structures for formal and informal communication and collaboration, including regular monthly program meetings, also facilitated the growth of this program culture of inquiry, distributed expertise, and trust. The data retreats in which all program members participated and collaboratively investigated the PACT data were frequently cited as key events for individual and collective learning towards program improvement. The TEP director also stressed the importance of data retreats for facilitating collaborative data analysis activities that engage all faculty and supervisors. As she said, "retreats are for everybody. It's an opportunity to integrate and share across practices." The TEP director used the data retreats as time for "people who don't get an opportunity to talk throughout the program [to have] opportunities to sit down and talk and share." A supervisor also emphasized the importance of meeting to share data:

> The biggest thing I think we do with that data is share it. For it to drive what we do, first it needs to be shared… The more data we get, the more we share, the more we meet, all having the same hope and intention in mind for our student teachers for what we want them to be when they leave the program. (Supervisor)

Our data also indicated that the PACT data was particularly helpful in facilitating goal-oriented data analysis activities because it helped create a common language of practice among program members with different roles. PACT offers program-level data that "everybody can understand now" (TEP Director). This common language allowed people to analyze and adapt their practices in ways that were relevant to the program as a whole. In this sense, the PACT/edTPA framework became the primary conceptual tool that program members used, in a collective way, towards the object of data-informed program improvement.

There were multiple unique contextual and organizational factors at UCSB that appeared to drive data-informed program changes, which included changes to both individual course and fieldwork curricula; changes to program structures and policies (e.g., the sequence and content of course offerings overall); the implementation of new externally created assessments (e.g., PACT/edTPA); the creation of new tools to support program goals (e.g., universal lesson planning template, discussed in Chapter 6); the creation and integration of new internally created sources of evidence (e.g., video data); and the use of data retreats to facilitate collaborative data use goals and processes.

These program changes were facilitated by contextual and organizational factors, such as their organizational history and mission as a large public research university dedicated foremost to scholarly inquiry; the small size of their TEP; divisions and status differentials between ladder faculty primarily associated with the Department of Education and faculty (including adjunct faculty) and supervisors located within the TEP; and history of participation in both the statewide development of PACT and the programmatic implementation of PACT (and now edTPA). Program changes were also facilitated by the interaction of many other organizational and interpersonal norms, policies, resources, and tools. In Table 3, I summarize several important organizational outcomes related to data use, and describe how these outcomes were supported and orchestrated by organizational and interpersonal characteristics and practices. The table highlights that these organizational supports were not merely static characteristics of one node of the activity system. Instead, the orchestration of object-oriented organizational change requires attention to how different aspects and practices within the activity system interrelate and interact together. These themes, and the relationships and interactions among different organizational

and interpersonal supports and resources, will be explored in further detail, and in light of additional theoretical perspectives, in the following two cross-case chapters.

Table 3: *UCSB activity system supports and interactions*

Organizational Outcomes	Activity System Supports & Interactions
Development and evolution of data use practices aimed at the object of data-informed program improvement	Program leaders explicitly connected programmatic research and data use activities to the object of producing excellent novice teachers and serving P-12 populations with well-prepared novice teachers *(Community/Object)* TEP director tried to leverage policy changes and increased data sources (e.g., PACT/edTPA) for program improvement goals *(Community/Rules/Object)* Program members identified continuous improvement as a key aspect of program goals *(Community/Object)* Program leaders and members encouraged development and use of new sources of evidence to foster programmatic innovation, research, and evaluation (e.g., video data) *(Tools/Object/Community)* PACT/edTPA data was available for use by all community members, primarily through collaborative activities such as scoring and data retreats *(Tools/ Division of Labor (DOL)/Rules)* TEP director and TPA coordinator analyzed data and created data representations to facilitate easier faculty access to data *(Tools/DOL)* TEP director and staff engaged with other data sources necessary for accountability purposes to decrease faculty workloads related to external reporting and encourage faculty engagement with PACT data, which they have found most useful for program improvement purposes *(DOL/Tools/Object)* Program members created tools and assessments to provide additional evidence for evaluation of program goals (e.g., lesson plan template) *(Tools/Object)* Increased national visibility related to PACT/edTPA participation *(Tools/Community)*

	Data became integral to decision making related to program improvement *(Tools/Rules/Object)*
TEP demonstrated a collective sense of internal accountability	Program leaders explicitly connected programmatic research and data use activities to the object of producing excellent novice teachers and serving P-12 populations with well-prepared novice teachers *(Community/Object)* TEP director tried to leverage policy changes and increased data sources (e.g., PACT/edTPA) for program improvement goals *(Community/Rules/Object)* Program members identified continuous improvement as a key aspect of program goals *(Community/Object)* Program demonstrated a strong inquiry orientation to data use and particularly collaborative data use activities *(Community/Rules/Object)* Program leaders and members used program research and development efforts related to PACT/edTPA to engaged in self-study and publish results in peer-reviewed journals, thus linking the object of program improvement to the institutional object around research and scholarly activity *(Tools/Rules/Object)* Program members spoke about the object of student and program learning and improvement as more important than complying with external accountability policies and standards *(Object/Community)* There was a cultural norm that they were "not afraid of data" related to PACT participation and development of inquiry orientation to data use *(Community/Rules/Tools)* The object of student and program learning and improvement guided the development of programmatic research and development *(Object/Rules)* Program leaders organized data use activities primarily for internal (inquiry & program improvement) purposes over external (compliance & external accountability) purposes *(Community/Rules)* Program administrators and staff completed large amounts of the work necessary to comply with external accountability policies (e.g., accreditation reporting) while making time and space for *all* program members to participate in collaborative data use activities that will primarily serve internal program improvement goals *(DOL/Rules/Object)*
Extensive collaborative data use	Various formal and informal collaborative structures (e.g., 2-

in TEP that engaged all program members (faculty, supervisors, staff, administrators)	3 data retreats per year; monthly program meetings; committee responsible for creating a universal lesson plan template) provided time and space for collaborative inquiry aimed at program development and evaluation *(Rules/Object)* Many collaborative data use activities were oriented around the use of candidate artifacts, which program leaders identified as particularly useful for engaging faculty in collective data use work aimed at program improvement *(Tools/DOL/Object)* PACT and edTPA were particularly helpful tools for program improvement goals because they are program-wide tools, shared by all members, that assess the entire program curriculum in a holistic way *(Tools/Community)* Required scoring of PACT/edTPA by almost all program members (including faculty, supervisors, and graduate students) created a common language of practice among program members and a shared understanding of the program *(Tools/Rules/Community)* Workload adjustments and supports (e.g., suspending normal program activities during scoring week; engaging graduate students in scoring) helped make time and space for all program members to participate in PACT/edTPA scoring *(Rules/DOL)* Scoring was written into job descriptions and became part of the regular program culture and routines for all program members *(Rules/DOL)* Faculty and supervisors were expected to incorporate PACT/edTPA frameworks into their practice *(Tools/Rules)* All program members were expected to participate in data retreats and program meetings where data use activities occured *(Rules/DOL)* Strong cultural value related to distributed expertise informed collaborative data analysis practices *(Community/Rules)* "Culture of respect" and trust amongst program members, including program leaders, informed collaborative data use activities *(Community/Rules)* Program leaders strategically prepared data sets relevant across programs for data summits to facilitate collaborative data use practices *(Tools/Rules/DOL)* Increasingly strong community values and cultural norms

	around collaboration developed *(Community/Rules)*
A growing collective sense of faculty agency, including faculty input in programmatic decision-making	Program members shared a strong, cohesive vision of program goals and had a voice in creating and updating those program goals *(Community/Object)* Demonstrated a strong inquiry orientation to data use and particularly collaborative data use activities *(Community/Rules/Object)* Strong cultural value related to distributed expertise informed collaborative data analysis practices *(Community/Rules)* "Culture of respect" and trust amongst program members, including program leaders, informed collaborative data use activities *(Community/Rules)* Program leaders positioned faculty to make or have input in programmatic decisions *(Rules/Community/DOL)* Supervisors increased their visibility and voice within TEP because of their work with PACT/edTPA *(Tools/Community)* There was evidence of program members using dissent as a resource in the change process *(Rules/Community)* Increasing opportunities for faculty voice and decision making through new collaborative structures aimed at providing time and space for programmatic research and data-based evaluation *(Rules/DOL/Community)*
A growing sense of shared responsibility for student and program outcomes amongst TEP program members	Program members shared a commitment to program improvement and a strong, cohesive vision of program goals and had a voice in creating and updating those program goals *(Community/Object)* Required scoring of PACT/edTPA by almost all program members (including faculty, supervisors, and graduate students) created a common language of practice among program members and a shared understanding of the program *(Tools/Rules/Community)* Increased use of a common language of practice and increased understanding of other program members' roles in the program and curriculum *(Community/Tools/DOL)* Approximately 50% of ladder faculty in the SOE taught in TEP and were involved in collaborative data use activities *(DOL/Rules)* Program leaders created new positions to distribute expertise and leadership to contribute to data-informed program

	improvement efforts (e.g., PACT/edTPA coordinator) *(DOL/Rules/Community)* Program members had access to various types of student and program outcome data primarily from program administrators and through collaborative structures for data use *(DOL/Tools/Rules)* Strong cultural value related to distributed expertise informed collaborative data analysis practices *(Community/Rules)* "Culture of respect" and trust amongst program members, including program leaders, informed collaborative data use activities *(Community/Rules)* PACT/edTPA measured students' performance and development outside of individual course or fieldwork structures and thus reflects on the curriculum as a whole *(Rules/Object)* Strong cultural expectation and belief that program members together, not just individually, were responsible for student outcomes *(Community/DOL/Object)*

Alverno College

Context. Alverno College is a Roman Catholic, four-year, independent, liberal arts college founded by the School Sisters of Saint Francis in Milwaukee, Wisconsin. Alverno is a single-sex women's institution at the undergraduate level, but serves both female and male students at the post-baccalaureate and graduate level. The college's mission statement asserts that the students' "personal and professional development is the central focus of everyone associated with Alverno" (http://www.alverno.edu/aboutalverno/missionhistory/). Alverno serves an ethnically and socioeconomically diverse student body, the majority of whom are from Milwaukee County. Half of their students come from underrepresented ethnic groups, and 75% are the first in their families to attend college. Partly due to its religious affiliation, Alverno has a clear commitment to social justice and to educating a diverse group of students that includes

those traditionally underrepresented in higher education. With an enrollment of 2,815 students college-wide, it was one of the smallest institutions included in this study. They have both undergraduate and graduate licensure and licensure to Master's programs, with 60 to 90 teacher candidates recommended for teacher licensure each year.

Since the early 1970s the college has focused on student *abilities* and has relied on student-level assessments and data to determine competency in eight core, internally defined abilities, including: communication, analysis, social interaction, problem solving, effective citizenship, developing a global perspective, valuing in decision-making, and aesthetic engagement (Alverno College Faculty, 2005). Every course at Alverno is designed to address specific levels of these abilities, and every academic major is designed to develop mastery of each ability. In the late 1970s, an interdisciplinary Teacher Education Study Group formed to conceptualize what became five additional "Advanced Education Abilities" (AEA) (Alverno College Institute, 2001). These are discipline-specific abilities that education courses and programs develop and assess: conceptualization, communication, coordination, diagnosis, and integrative interaction. A document outlining how the ability-based framework is conceptualized and enacted in teacher education stated the relationship between the abilities and faculty collaboration and inquiry for program improvement:

> All Alverno faculty assist students in developing abilities through the study of the disciplines by emphasizing the process of "doing the disciplines" (*integrating* knowledge and skill) at all levels of the curriculum. Since the nature of abilities is best seen in performance, we work to *ground* students' understanding of theory in realistic, experiential applications. Because the abilities cut across disciplines and levels of student development, we work in primarily *collaborative* ways for the sake of student

> learning. Courses consciously and *explicitly* revisit frameworks and concepts as *developmental*, progressively complex iterations rather than as isolated experiences. The demands of rethinking the way we teach has fostered a college-wide emphasis on scholarship and research on the processes of teaching, learning, and assessing *(reflective practice)*. (Alverno College Institute, 2001; emphasis in original)

The ability framework and curriculum was developed to teach and assess the knowledge, skills, and dispositions important within and across different disciplines and professional practices. The common, cross-disciplinary curricular framework supported the frequent and substantive inter-departmental collaboration evident at Alverno.

The college's outcome orientation, centered around developing and assessing competency in both their eight core abilities and advanced discipline-specific abilities, has led Alverno to consider themselves selective not on the way into programs, but on the way *out* of programs. The long-standing practice of focusing attention on student outcomes facilitated an institution-wide culture that has allowed faculty and administrators in Alverno's teacher education programs to adapt relatively easily to contemporary pressures around data use. A faculty member explained that "our school is very data driven," and has been for over forty years.

The adoption in 2000 of Wisconsin PI 34, the Wisconsin Administrative Code for Teacher Education Program Approval and Licensing, restructured teacher education, educator licensing, and professional development based on the Wisconsin Educator Standards. Initial licensing requirements became based on an educator's successful performance as measured against these standards. The assessment system for teacher preparation programs at Alverno, based on the ability framework, was adapted following the adoption of PI 34 with input from

faculty within the School of Education (SOE) and across the college, as well as colleagues in P-12 schools. The updated assessment system addressed both state standards and the Advanced Education Abilities, with syllabi and assessment instruments making explicit links to relevant standards and abilities.

In the state of Wisconsin, the use of value-added measures in the measurement of educator effectiveness was underway, although, like most states, was still in its infancy. The Wisconsin State Legislature passed Act 166 in 2011, which required Wisconsin Department of Public Instruction (DPI) to produce an annual report about the state's educator preparation programs and their program completers' pass rates on required performance assessments. As of the latest state reports published in 2013, the state included licensure and employment data, and Praxis II and American Council on the Teaching of Foreign Language (ACTFL) assessment pass rates. The state will include the Foundations of Reading Test for Wisconsin results, edTPA results by program, and continuous employment trends by graduate cohorts in future reports, but these data have not yet been included.

Alverno was a voluntary lead pilot institution for the edTPA in Wisconsin during the time our data collection, and had been for a few years. Wisconsin had not yet begun requiring completion of edTPA as a condition of licensure during the years of our data collection, although efforts to implement a statewide edTPA policy were underway. Wisconsin began requiring that all teacher candidates completing Wisconsin Educator Preparation Programs after September 1, 2015 complete edTPA. EdTPA will begin being consequential for licensure decisions in Wisconsin starting in the 2016-2017 year. Alverno faculty made a strategic decision to pilot edTPA in order to have a voice in the process. They wanted the opportunity to provide feedback both to state policymakers and the creators of edTPA. Two program leaders (a dean and

associate dean) were involved in edTPA national advisory boards and standards-setting and policy panels. Because of Alverno's long-standing focus on performance assessments, the edTPA was not viewed as conflicting with their own theory of action or internal, existing performance assessment system. Program leaders also promoted the affordances of the new assessment tool to faculty and staff. Program adaptation to edTPA was described as a relatively natural process because "we've always had performance assessments in our student teaching program" (Dean).

Organizational Supports for Data Use Practices and Processes. A report to the Wisconsin Department of Public Instruction (DPI) stated: "Use of data for continuous improvement is part of the culture at Alverno, where data are used both to support individual student learning and growth and to guide changes in programmatic elements that can provide that support." There was ample evidence that corroborated this stated object of using data for both individual student learning and continuous program improvement. For example, each year as part of admission to the student teaching process at Alverno, SOE faculty review candidate performance on a pre-student teaching portfolio assessment. In their yearly review of the data, faculty consider both student readiness to start student teaching, and also consider what the data across candidates implies in terms of programmatic changes that could better support candidates. A dean described how their assessment data helps them with their dual goals of improving individual student learning and their overall programs:

> Programmatically, information from classes gets abstracted through common experience and allows us to create ways of looking at programs. Because assessment is about individual students and their learning, program evaluation is about program learning or

> institutional learning based on the same data, but the data have to be there for student learning or they don't really work for the program learning.
>
> It's an iterative process of here's what we want to get—that's really central—here's what it looks like, and then how do we use data along the way to hone how we get there, to give ourselves feedback so we know where we are on the way, and to suggest questions that we want to talk about together as faculty in a school or in the whole institution. (Dean)

Alverno's focus on student outcomes drove the program's data use processes and practices. The program continually strove to get clear on "what it is that's important" (Dean) and then used assessments to inform their progress toward meeting identified outcomes because "none of us knows everything and it will keep opening up as we move forward" (Dean). The teacher education programs relied on many forms of data to inform program improvement. These included internally created assessments (largely performance-based assessments) required of all undergraduate majors and candidates in graduate programs, which were often embedded in courses, as well as internally created "external assessments", which were performance assessments (e.g., simulations) used outside the course structure to assess both core abilities and advanced discipline-specific abilities. The "external assessments" were designed to ensure that students were able to transfer knowledge and skills to scenarios and experiences located outside a specific course or field experience. The SOE also used assessments created outside Alverno that were specific to the major or discipline, and were in most cases related to state licensure policies (e.g., edTPA, PRAXIS). Student feedback and self-assessments were also important to both individual learning and program learning goals. The School of Education (SOE) also

collected and analyzed enrollment, demographic, candidate satisfaction, and post-graduation employment data.

The productive tension between continuity—informed by their long history with a consistent conceptual framework related to the development of particular abilities—and change aimed at program improvement was a major theme at Alverno. Syllabi, course content, and assessment instruments were regularly reviewed by faculty both within the SOE and across the college to make sure that all of the Wisconsin Educator Standards and the AEAs were fully integrated across licensure programs. The definitions of core and discipline-specific abilities, what outcomes looked like at particular developmental stages of the abilities, and the nature and content of assessments aimed at evaluating students' abilities, were regularly reviewed and updated as necessary by interdepartmental groups of faculty. Reviews of processes and forms that guide field work and clinical practices were also reviewed and revised on a regular basis. Program leaders and faculty repeatedly stated that program members worked to ensure both that assessments remained relatively consistent over time to enable multiple year data comparisons, and also that the curriculum, assessments, and data use practices were a work in progress and were informed by faculty voice and updated as necessary.

Several technical tools supported data collection and analysis practices at Alverno. College faculty and staff used a Datatel software system as their student information system, which the College adapted to fit the data management needs related to the abilities framework. This system housed data such as enrollment and demographic information, and ACT, PRAXIS I, and PRAXIS II scores. The system also included data on candidates' progress in demonstrating the abilities. All faculty have access to these data, and can make individual or group queries about students. The Diagnostic Digital Portfolio (DDP), an electronic data platform developed

internally and implemented in 1999, was an important tool for key assessments to be uploaded. Faculty provided feedback through the DDP on these key assessments, and students recorded self-assessments in this system. The system also allowed assessments to be linked to state and national standards. Assessment designs were also available on the DDP. Faculty had access to all data housed within the DDP. All syllabi were available to faculty on the Alverno intranet and to candidates on Moodle, the course management program. Course assessments were available to students and faculty through Moodle.

The DDP was the primary system faculty and administrators discussed using to access, evaluate, and analyze performance data. It allowed faculty access to all student data, and allowed students access to their own data. While its primary purpose was to assist faculty and students in monitoring student progress, it was also used to assess program effectiveness. However, a couple program members we spoke to identified several shortcomings of the system related to pulling data for program-wide needs. During the period of our data collection, faculty and administrators had begun gathering input from various program members about desired features for an improved data platform and were planning to upgrade the tool (more information about this process can be found in Chapter 6).

The SOE collected data from candidates, including the percentage of candidates who did not meet, met, or exceeded expectations on key assessments across the program. These data were regularly aggregated and analyzed primarily through Excel spreadsheets by the Associate Deans for undergraduate and graduate programs and program directors. The findings were presented to SOE faculty at yearly spring data retreats, and all department faculty and administrators would participate in data analysis activities aimed at program improvement. Qualitative data from a sample of courses were also included in data retreats.

Data use activities were also supported by the College's Assessment Center and the Office of Educational Research and Evaluation (ERE), as well as the staff associated with these offices. Assessment Center staff coordinated college-wide assessments. They also trained community assessors; Alverno had a long history of engaging community members (including alumni) in understanding what skills, knowledge, and dispositions were valued by community professionals and in assessing students' performance and development on Alverno's ability-based assessments. Alverno also engaged community members in data use activities through program advisory councils, which met several times a year to review program outcomes and provide an external stakeholder voice in program evaluation and improvement goals. The SOE collaborated regularly with ERE staff, who held significant responsibilities in building and maintaining data collection, analysis, and evaluation systems for all departments. For example, ERE staff members coordinated, implemented, and analyzed post-graduation candidate and employer surveys and studies. ERE staff also participated in collaborative data analysis activities with SOE members; for example, during the edTPA pilot, some ERE staff joined SOE members in ongoing review of candidate work on the edTPA aimed at program evaluation and improvement.

The primary conceptual tool that guided all of the work of the College, including data collection and use, was the abilities framework. One faculty member stated, "it's the eight abilities that make our curriculum coherent." The abilities framework provided a common language of practice for reaching the collectively articulated student and program outcomes, and there were numerous "internal accountabilities around these abilities" (Associate Dean/Faculty). Faculty were expected to understand the abilities framework as well as their disciplinary content frameworks. A program administrator said, "what makes us unique is the fact that we've

articulated a set of educational principles that we think are really important to help our students develop, and we've designed and supported our curriculum and our faculty around that." The longstanding performance assessment tradition is then designed to "collect data and have conversations amongst ourselves in order to make sure that we really are doing that" (Program Administrator/Faculty).

The productive tension between continuity and evolution that was so pervasive at Alverno was seen in how groups of faculty consistently investigated and revised aspects of the ability framework and related program curricula and assessments. A faculty member from the sciences spoke about the need to balance discipline-specific frameworks and related content with the abilities framework and the development of particular cross-disciplinary skills and dispositions. He also talked about the curriculum being "alive":

> When this curriculum was developed, it was developed by some of these colleagues at this table and their predecessors, and so the curriculum in a sense gets established, but it's not stagnant. It's not eternal. It is actually alive and so as faculty, we talk about leadership, we're constantly revisiting the assumptions and reworking them with our own [perspectives]. (Faculty)

There were many examples of times when groups of faculty had collaboratively revisited the definitions and assessments related to various abilities in both within-department and interdepartmental forums. Two recent examples discussed included: an interdepartmental group of faculty focusing on the 'analysis' ability was looking at the role of emotion in analysis and incorporating their findings into related curricula and assessments, and another group focusing on the 'problem solving' ability was investigating cognitive theory and neuroscience research

and considering how that related to their conception of the skills, knowledge, and dispositions related to problem solving.

'Ability groups' were an organizational structure that supported these interdepartmental conversations and inquiries. Each faculty member at Alverno was required, after their first year during which they underwent training and support to understand the holistic framework, to choose membership in an ability department. Faculty referred to this as a way that they were "bicultural," having a dual identity in their disciplinary department and an ability department. The next section will further describe faculty's roles and expectations within those ability departments.

Program Culture and Faculty Engagement. Data use activities at Alverno were an official part of faculty and supervisor expectations and were part of regular program culture and routines. In fact, collaborative data use activities were an official aspect of hiring and promotion criteria and were written into both full and part-time job descriptions, with language such as "Departmental responsibilities include collaboration with an outstanding team of faculty and ongoing curriculum development and enhancement" and "The successful candidate should have a passion for teaching excellence and a willingness to work in a highly collaborative environment." In annual review and promotion, faculty self-assessed and were evaluated on three main categories: effective teaching, responsible work in the college community, and developing scholarship. The dean reiterated this:

> Our promotion criteria are different. It's not that anybody's prevented from publishing in their own area, but… we're very focused on the learning of our students. I would characterize most of the research we do as falling in the scholarship of teaching and learning… That energy is put into common collaborative work that enriches our

individual teaching, but also goes farther than ourselves because there's the collaboration around it. If you want to think about the number of hours a responsible, good faculty member at a university puts in, it's probably not any different in hours, but there's a shift in what the time is spent for.

The value placed on having an outcomes orientation was also an important aspect of hiring and being part of the Alverno community. As the dean stated: "To become a faculty member here, you really need to buy into: it's about student learning. It's about working together for student learning. It's about continuous improvement." Data from both internally created and externally created assessments played a key role in their object of continuously improving their students' learning and their programs. They explicitly valued the collective data use activities that drove program change.

Several organizational structures and norms reinforced the value of collaborative faculty engagement in data use activities, both within disciplines (e.g., the SOE) and across the entire college. For about 40 years, no classes have been held on Friday afternoon to leave time for different collaborative groups to meet. For example, "ability" department meetings occurred monthly or bimonthly on Friday afternoons, as did all-faculty meetings/workshops and the new faculty workshops that were held each Friday that "ability" groups met for first-year faculty (after their first year faculty chose an ability affiliation and joined an ability group). Faculty also participated in weekly "discipline" (e.g., education) department meetings; all SOE faculty, including all full-time, most part-time, and most supervisors, met every Tuesday for two hours during which no classes or other obligations were scheduled.

Various other structures facilitated faculty collaboration as well, including the college-wide, multi-day "Institute", which was a faculty retreat held three times a year, often centered

around data analysis related to short-term and long-term goals. "Institute" occurred at the beginning of each semester and the end of the school year. Each multi-day retreat included collaborative time and space for all-faculty activities and for subcommittees and subgroups of faculty to meet, based either on departmental affiliation (e.g., ability or discipline groups) or interest (e.g., interest in the role of technology in teaching and learning). Internal scoring of the edTPA assessment during its pilot implementation was another activity that facilitated faculty collaboration around data use. The School of Education Liaisons (SOELs) committee, comprised of education faculty members and colleagues from the content disciplines across campus, also met regularly. These many meetings were used as a space for decision-making based on local values:

> We had some feedback last week from a group saying, "you guys meet too much." That's like saying you use too many commas, right. (Laughter) It really depends on what you meet for and what happens as a result of the meetings, because I'm struck at how much we get done in meetings, which then is the kind of testament to we really don't want somebody going off and just imposing decisions on us because that's a recipe for it not working. (Dean)

The SOELs committee, ability departments, and regular all-faculty "Institutes" were three particularly salient examples of the significant institutional investments to support continued and regular interdepartmental and cross-disciplinary collaboration evident at Alverno.

The data retreats and data use activities that members of the SOE and often the entire college engaged in were usually scheduled during preallocated times on Tuesdays and Fridays, and were occasionally scheduled at additional alternate times or as part of the thrice-yearly all-college "Institutes". Data use activities engaged both individual student data and program-wide

data, including quantitative data such as standardized test scores and qualitative data such as student artifacts or narrative feedback.[3] For example, sometimes meeting time was used to examine a single candidate's work over time to determine why candidates don't attain expected outcomes. One such example occurred during a data retreat when SOE faculty were examining edTPA results after their third semester of their edTPA pilot. They were surprised to see a candidate "who had just graduated with honors" and for whom faculty held "robust consensus that this student was fantastic" (Associate Dean) had done more poorly on the edTPA than expected. Faculty traced her performance back across her coursework and fieldwork, and realized that none of the candidate's four field placements had a math focus. They realized they didn't have programmatic checks to ensure field experiences covered the range of content areas candidates would be required to teach. As a result of this realization, they restructured field placements such that candidates would experience and teach a range of content areas, and also added mini-edTPA assessments attached to these field experiences to better assess candidate performance throughout the curriculum.

These many collaborative structures that made strategic time and space for the work of curriculum mapping, local decision making about valued outcomes and assessments, and data analysis were part of Alverno's long history prioritizing collaboration. Each semester program leaders gathered to discuss the goals for the semester and strategically plan the Friday meetings accordingly. Our data suggested that there was an important relationship between the organizational investments around built-in collaborative space and the community's clear cultural values and norms around collaboration. As one faculty member and program

[3] As part of Alverno's outcome orientation, students are not assessed using letter grades. Instead, they are assessed by leveled criteria related to demonstrated performance in the abilities. Faculty are required to give students narrative feedback on assessments and in courses. There is also a self-assessment component of every internally created assessment at Alverno.

administrator said, “It’s very collaborative here and very collegial and so the time is really set up to kind of build in that space and that collaboration.” An associate dean said she thought of her various collaborative responsibilities on and meetings not as “expectations”, but rather as “opportunities”.

This general cultural value around collaboration, and the organizational structures that supported that community value, facilitated collaborative data analysis activities at regular intervals. A dean stated:

> I think it’s that collaboration piece that brings in that engagement piece and I think that’s how we get people ... not get people, that’s how people become so engaged in the process because they have a real stake in it. It’s not something that we’re saying to them this is the question. It’s what do we need to as a group and it’s always focused obviously on our students and our outcomes. We just aren’t ever stagnant that way. (Dean)

This general inquiry stance, and faculty ownership of the questions asked of various forms of data and agency in decision making processes surrounding data use, were important factors in faculty engagement in data use for both individual student learning and program improvement purposes.

The institutional value around collaboration and the organizational structures, norms, and tools that supported collaboration also fostered open and frequent communication among faculty (both within the SOE and across disciplines). This openness provided room for disagreement or differences in philosophy with regard to data use. As one faculty member put it, faculty are “never [encouraged] to stop talking” and are always listened to, even if it doesn’t necessarily change the outcome. In fact, different perspectives and even disagreements were sometimes encouraged as a way to move the work forward. In a focus group, several faculty members

mentioned times when faculty disagreements spurred further data-related inquiries and collaborative work towards program improvement. For example, a disagreement between two faculty members from different disciplines arose within their ability group, and "they couldn't resolve it so they shined a light on it. They had an Institute session where they stood up and had this debate in front of faculty" (Faculty). This public debate "led to the work they're [that ability group] doing right now" (Faculty).

The many forms of collaboration at Alverno, and the data use activities fostered by several collaborative structures, were all in service of the dual organizational missions of student growth and program growth. These objects informed each other, and were related both philosophically and practically. One aspect of this connection was that, as several faculty members and program administrators explained, they were committed to modeling data use for both individual student growth and program improvement; one of their goals for teacher candidates was that they, too, would be able to use various sources of evidence to improve their practice and their students' outcomes. As two program members said:

Associate Dean: I think that just as we try to develop the students, we try to be clear-eyed about our strengths and areas of growth, and that the purpose and focus of data is to inform that so that we can continually revise to improve.

Program Administrator/Faculty: Just like we're teaching people to do. (Laughter)

Associate Dean: Yes, yes, practice what you preach.

Program members were similarly committed to their own growth as practitioners in order to better serve their students' growth: "I think that as a whole, we are reflective practitioners. And if you're going to be a reflective practitioner, one of the things you have to start with is data" (Faculty).

At Alverno College there were multiple unique contextual factors that appeared to drive data-informed program changes, which included changes to both individual course and fieldwork curricula; changes to program structures and policies (e.g., the sequence of course offerings and policies about how students are advanced); the implementation of new assessments (e.g., edTPA); the creation and integration of new internally created assessments (e.g., mini-edTPA assessments) and updated ability-related assessments; and the evolution of existing meeting structures to include more data use activities; and the integration of data platforms designed and/or adapted by college members to meet program needs.

These program changes were facilitated by contextual and organizational factors, such as their small size; religious history and affiliation; commitment to providing higher education opportunities to underserved populations particularly in the Milwaukee area; mission as a small, teaching-oriented liberal arts college (with a limited number of graduate programs) dedicated foremost to the personal and professional development of individual students; longstanding outcomes orientation; cohesive vision of program goals related to their abilities framework; long history using performance assessments as tools for individual students and organizational learning; and simultaneous organizational commitment to the abilities framework and to adapting the framework and related tools to meet current needs. These changes were also related to the interaction of many other organizational and interpersonal norms, policies, resources, and tools. In Table 4, I summarize several important organizational outcomes related to data use, and describe how these outcomes were supported and orchestrated by organizational and interpersonal characteristics and practices. The table highlights that these organizational supports were not merely static characteristics of one node of the activity system. Instead, the orchestration of object-oriented organizational change requires attention to how different aspects

and practices within the activity system interrelate and interact together. These themes, and the relationships and interactions among different organizational and interpersonal supports and resources, will be explored in further detail, and in light of additional theoretical perspectives, in the following two cross-case chapters.

Table 4: *Alverno activity system supports and interactions*

Organizational Outcomes	Activity System Supports & Interactions
Development and evolution of data use practices aimed at the object of data-informed program improvement	Demonstrated clear messaging and support by leadership and program members around the organizational mission to continuously improve both student learning and organizational learning *(Community/Object)* Program members shared common and concrete understandings of the objects of the activity system, including data-informed program improvement *(Object/Community)* The longstanding institutional outcomes orientation was congruent with data-informed program improvement *(Object/Object)* Outcome orientation was part of the institution's history and official mission *(Rules/Object)* Outcome orientation was related to the values around social justice held by College founders and members over time *(Community/Object)* Outcome orientation and social justice orientation were heavily influenced by Alverno's religious affiliation and history *(Community/Object)* The institutional outcomes orientation was integrated into all aspects of the Alverno curriculum; e.g., students receive regular feedback on their performance and development relative to the abilities framework *(Rules/Object)* Student learning and program improvement goals were included in published mission statements and Alverno documents *(Rules/Object)* Program policies such as promotion and tenure guidelines

	reflected these goals *(Rules/Object)* Formal meeting structures provided time and space for collaborative inquiry aimed at student learning and organizational learning *(Rules/Object)* The College's Assessment Center and Educational Research and Evaluation and Evaluation Office (and their staff) supported SOE and interdepartmental assessment development and data use activities *(Division of labor (DOL)/Tools/Object)* The abilities framework provided common and concrete conceptions of desired student outcomes *(Tools/Object)* College members spoke of valuing student learning, individual professional improvement, and program improvement *(Community/Object)*
Both the SOE and the College demonstrated a collective sense of internal accountability	Program members identified the object of student and program learning and improvement as more important than complying with external accountability policies and standards *(Object/Community)* The outcome orientation that was part of the institution's history and official mission guided the creation and adoption of tools to assess student outcomes *(Rules/Tools/Object)* Outcome orientation was guided by the social justice values held by College founders and members over time *(Community/Object)* Outcome orientation and social justice orientation were heavily influenced by Alverno's religious affiliation and history *(Community/Object)* Program leaders organized data use activities primarily for internal (inquiry & program improvement) purposes over external (compliance & external accountability) purposes *(Community/Rules)* Program leaders and program/college staff completed large amounts of the work necessary to comply with external accountability policies (e.g., accreditation reporting) while making time and space for *all* program members to participate in collaborative data use activities that would primarily serve internal program improvement goals *(DOL/Rules/Object)* All students, faculty, and staff underwent self-assessment processes (individual internal accountability). Faculty at Alverno had to self-assess based on promotion criteria,

	including "responsible work in the college community" *(Rules/DOL/Object)*
Extensive collaborative data use both within the SOE and across the College that engages all program members (faculty, supervisors, staff, administrators)	Collaborative program improvement activities were incorporated into hiring and promotion guidelines *(Rules/Object)* Demonstrated very strong community values and cultural norms around collaboration *(Community/Rules)* Demonstrated very strong college-wide outcomes orientation and longstanding commitment to evaluating individual and program performance and development based on common conceptions of desired outcomes *(Community/Rules/Object)* A variety of tools (e.g., internally created and externally created assessments) were used as data sources that serve student learning and program improvement *(Tools/Object)* Individual and program data were available to all faculty through electronic data platforms designed to fit specific institutional needs *(Tools/DOL)* All program members (faculty, supervisors, administrators) participated in collaborative data use activities, often during required meeting time/space *(DOL/Rules)* SOE members collaborated with faculty and staff from outside the SOE on data use activities, often during required meeting time/space *(DOL/Community/Rules)* Various collaborative structures (e.g., faculty meetings, ability department meetings, Institute, SOELS, etc.) were in place to facilitate collaborative inquiry both within the SOE and across departments aimed at program improvement *(Rules/Object)* Long history of using performance assessments to evaluate student and program outcomes *(Rules/Tools/Object)* As additional assessments were state mandated and/or included in the curriculum (e.g., edTPA; Foundations of Reading Test), SOE faculty and interdisciplinary faculty groups dedicated more meeting time to understanding the new assessments, curriculum mapping activities, the development of new supporting assessments, and analyzing various sources of data with the aim of using them to inform student and program outcomes *(Rules/Tools/Object)*
A strong collective sense of faculty agency, including faculty input in programmatic decision-	Program members spoke of a strong sense of trust and respect amongst faculty, supervisors, and administrators, fostered in part by the expectations around frequent

making	communication and collaboration *(Community/Rules)* Program members spoke of freedom to disagree, and using different perspectives and beliefs towards improvement goals *(Community/Object)* Frequent collaboration through required and pre-allocated time and space (e.g., various Tuesday and Friday meeting time/space) *(Rules/DOL)* *Rules/Community:* Cultural norms and policies around self-assessment and peer feedback; e.g., faculty were required to seek out feedback from their colleagues to support their own professional improvement *Rules/Community/DOL:* Program leaders were positioned faculty and supervisors to make or have input in programmatic decisions
A strong sense of shared responsibility for student and program outcomes amongst program members, both within the SOE and across departments	*Object/Rules:* Program members had a solid and shared understanding of desired program outcomes, particularly with respect to the Alverno abilities, and had a voice in the evolution of desired program outcomes *Object/Community:* Program members were committed to data-informed individual and program improvement *Tools/Object:* The abilities framework provided a common conceptual framework for desired program outcomes, and guided the sources of evidence that would help them evaluate individual and programmatic development, and data analysis activities *Tools/Rules/DOL:* Program members participated in the creation and/or evolution of the many internally created assessments related to the abilities framework that assessed student progress towards desired outcomes and informed program improvement efforts. *Tools/Rules/DOL:* Program members participated in the implementation process and evaluation of externally created assessments (e.g., edTPA), including state-mandated assessments (e.g., Foundations of Reading Test), with the expectation that the evidence they produced would be used towards program improvement goals *Rules/DOL/Object:* All college faculty regularly undertook curriculum mapping activities to make sure students are developing the desired abilities and outcomes throughout the curriculum, not just in one course *Rules/Object:* There were many assessments, including

	internally developed "external assessments" and edTPA, that measured students performance and development outside of individual course or fieldwork structures and thus reflected on the curriculum as a whole *Community/DOL/Object:* There was a cultural expectation and belief that program members together, not just individually, were responsible for student outcomes *Community/Rules:* Program leaders positioned program members as experts who could inform their collective learning, thus contributing to cultural values and norms around distributed expertise *Tools/Rules:* All program members had access to various types of student and program outcome data via electronic data platforms

Conclusion

This chapter detailed the context and history of each program as they relate to data use for program improvement purposes. Each program has a distinct history around data use practices, and I've highlighted how those relate to the institutional mission and goals of each case. The programs have significant differences related to their institutional missions: Alverno is a small teaching-oriented liberal arts college, UCSB is a large public research university with a small graduate-level TEP, and ECU is a large regional producer of new teachers with 17 preparation programs. They also each have unique histories related to data use: Alverno has a long history of largely data use tied to their institutional outcomes orientation; UCSB implemented PACT for about a decade, which smoothed the transition to implementing edTPA; and ECU has a relatively short but strong history investing in data use initiatives and developing, assessing, and evaluating several new program innovations.

While the institutions are significantly different, there were also remarkable similarities in the organizational and interpersonal resources, norms, policies, and tools that supported the

development and evolution of their data use practices aimed at program improvement. Several of these similarities are apparent by comparing the charts that are included and associated with each case. All three programs developed or revised their data use practices aimed at the object of data-informed program in ways that fostered faculty engagement and collaboration, while maintaining a collective sense of internal accountability despite external accountability pressures and policies. In the process, all three programs demonstrated a collective sense of faculty agency and a strong and growing sense of shared responsibility for student and program outcomes related to their object-oriented data use work. Many of the programs' similarities and differences will be considered in more detail in the next chapter, in which I examine the role of systemic "contradictions" (Engeström, 1987) in the development and evolution of programmatic data use practices.

Chapter 6: The Role of Contradictions in Expansive Learning

Introduction

The previous chapter described the sociohistorical and organizational contexts of the teacher education programs at Alverno College, East Carolina University (ECU), and University of California, Santa Barbara (UCSB), with particular attention to their histories and changes to their collective practices oriented around the evolving object of data use for program improvement. In this chapter, I highlight several pivotal moments and themes in the organizational change processes that were described in Chapter 5 by examining the role of contradictions in spurring and managing changes in the activity system.

The concept of contradictions in activity theory provides a useful lens to help understand and identify tensions between situated and institutionalized practices that shape the process through which work activities evolve amidst organizational change (Foot, 2001; Foot & Groleau, 2011; Groleau, Demers, Lalancette, & Barros, 2012)(K. A. Foot, 2001; K. Foot & Groleau, 2011; Groleau et al., 2012). Following Il'enkov (1977, 1982), it is the concrete manifestations of "systemic, irreconcilable contradictions between inherently oppositional forces" that occur within and between elements of the activity system, and between activity systems, that drive expansive learning and organizational development (Foot & Groleau, 2011, p. 4; Engeström, 1987). Contradictions "reveal the growing edges of the activity system" where development is possible and likely to take place (Foot, 2001, p. 63).

Engestöm and Sannino (2010) caution that "contradictions are the necessary but not sufficient engine of expansive learning in an activity system… contradictions become actual driving forces of expansive learning when they are dealt with in such a way that an emerging new object is identified and turned into action" (p. 7). In order for contradictions to be

"creatively and often painfully resolved," organizations need to generate "novel mediating models, concepts and patterns of activity that go beyond and transcend the available opposing forces or options, pushing the system into a new phase of development" (Engeström & Sannino, 2012, p. 371). Expansive learning occurs when contradictions lead to collective envisioning of a new, expanded object and new work practices and activities oriented towards that object. The reconfiguration of activity towards an expanded object occurs as a process of development through a collective zone of proximal development (Engeström, 2001; Engeström & Sannino, 2010). Engeström defined the collective zone of proximal development as:

> The distance between the present everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions. (Engeström, 1987, p. 174)

Expansive learning occurs as activity systems move in their zone of proximal development towards an expanded object and related new patterns of activity.

The notion of a "double bind" referred to in Engeström's (1987) definition of the zone of proximal development is related to the primary contradiction, the first of four levels of contradiction that Engeström (1987) defines. All three later levels of contradiction are rooted in the primary contradiction, which is always present and takes different forms depending on sociohistorical conditions. The *primary contradiction* in activities within capitalist societies involves the tensions between their use value (i.e., their inherent value) and exchange value (i.e., their commercial value) (Engeström, 1987; Foot & Groleau, 2011; Groleau et al., 2012). These primary contradictions occur within any of the nodes of an activity system. When the latent primary contradiction takes form in openly and concretely manifest *secondary contradictions* between two or more nodes of the activity system (e.g., between an evolving object and the

existing division of labor), it can lead individuals in the activity system to question and change their practices. When activities begin shifting to try to resolve a secondary contradiction, often by integrating elements of another activity system such as a new technology, this leads to *tertiary contradictions* as new patterns of activity are integrated into existing patterns of activity. As the focal activity system innovates and practices change, this creates *quaternary contradictions* with neighboring activity systems. It is worth noting that contradictions "cannot be observed directly; they can only be identified through their manifestations" (Engeström & Sannino, 2011, p. 369). These manifestations take many forms, including conflicts, dilemmas, double binds, disturbances, and local innovations (Engeström & Sannino, 2010, 2011, 2012).

Engeström (1987, 1999) proposed a relationship between these four levels of contradictions and a series of epistemic learning actions that typify the ascension from abstract to concrete in cycles of expansive learning. Expansive learning cycles occur through an "ideal-typical sequence of epistemic actions" (Engeström & Sannino, 2010, p. 7) that includes: (1) *questioning* or criticizing some existing sociohistorical practice(s); (2) *analyzing* the situation to understand causes or explanatory mechanisms; (3) *modeling* a potential solution to the contradiction; (4) *examining the model* by operating and experimenting on it to better understand its potential contributions and limitations; (5) *implementing the model*, including making conceptual and practical enrichments; (6) *reflecting* on and evaluating the process; and (7) *consolidating* its outcomes into a new stable form of practice (Engeström, 1999; Engeström, 2001; Engeström & Sannino, 2010).

Foot and Groleau (2011) expanded on Engeström's more general proposition of the relationship between contradictions and epistemic actions in expansive learning by suggesting

specific relationships between these two elements in cycles of expansive learning. Table 5 describes these connections.

Table 5: *Types of Contradictions and Corresponding Epistemic Actions*

Type of Contradiction	**Characteristics**	**Corresponding Epistemic Action(s)**
Primary	Occurs between the use value and exchange value of any corner of an activity system.	Questioning
Secondary	Develops between two corners of an activity system.	Analyzing Modeling
Tertiary	Arises when the object of a more developed activity is introduced into the central activity system.	Examining model Implementing model Evaluating process
Quaternary	Occurs between central activity and neighboring activities.	Consolidating new practice Questioning

From Foot and Groleau, 2011, p. 7

Engeström and Sannino (2012) argued that: "for analysis of inner contradictions at the level of organizations, we need a theoretical model of the systematic 'anatomy' of an organization" (p. 371). The previous chapter used the theoretical lens of the model of a collective activity system (Engeström, 1987) to describe such a systematic organizational anatomy. In this chapter, I will draw on that analysis and explore the role of contradictions and epistemic learning actions in the organizational change process. Through the analysis in this chapter, I demonstrate that despite significant differences in the three case's sociohistorical context and data use practices, there were also striking similarities in the types of contradictions each program faced and the "novel mediating models, concepts and patterns of activity" (Engeström & Sannino, 2012, p. 371) that were developed to help alleviate those contradictions

and evolve organizational work practices oriented towards the object of data-informed program improvement.

To best illustrate similarities and differences among the programs, I focus my analysis for this chapter primarily on the disturbances in the system accompanying the introduction of standardized performance assessments (edTPA and PACT) for these three programs. During the period of our data collection, all three programs were undergoing various changes related to evidence use and decision making. Notably, all three programs had recently begun piloting edTPA. Initial data analysis indicated that teacher performance assessments were particularly significant and useful tools for organizing collective, programmatic data use practices. The cross-case analysis herein highlights the introduction and use of teacher performance assessments in these three programs to illuminate common and differing tensions, dilemmas, and practices. However, I do not ignore other program data sources and innovations in this analysis, as they play important roles in both the manifestation of secondary contradictions and the subsequent realigning of structures and practices.

This is not an exhaustive list of the contradictions that manifested in these three programs, but rather focuses on contradictions that best illustrate how the process of expansive learning was similar in many ways, and different in others across these three programs with very different institutional contexts and histories related to data use.

Primary Contradiction: Internal vs. External Accountability

As explained above, primary contradictions involve the contradictory unity of use value and exchange value that take a different concrete form in each sociohistorical context. The primary contradiction manifests in all corners of the triangular structure of the activity system (Engeström, 1987; see Figure 1). For example, "they penetrate the subject and community

corners because labor force itself is a special kind of commodity" (Engeström, 1987, p. 69). As another example, tools such as commercial data platforms have use value for teacher education programs—they help organize various sources of data so that program members can access and use the data for various purposes—but also have costs associated with them including subscription costs; time, money, and human resources needed to train program members to use the tool and support continued use of the tool.

In teacher education, there is a strong use value related to preparing excellent novice teachers to serve P-12 students. In its most basic form, the exchange value is the commercial value of teacher education programs (TEPs). All three TEPs included in this study were situated within institutions of higher education, which face economic pressures and a scarcity of fiscal resources in this country. Most teachers in this country are still prepared in public universities, which are undergoing continued cuts to government financial support (Zeichner, 2010). In public and policy discourse, the value of teacher education programs is often related to the health of the national economy; as Cochran-Smith and colleagues note, this prevalent discourse emphasizes that "the nation's place in the knowledge economy depends on the quality of its educational system, and that the primary purpose of education is to produce a workforce that can meet the demands of the competitive global market" (Cochran-Smith, Piazza, & Power, 2013, p. 11).

It's noteworthy that higher education generally, and particularly university-based teacher education, is undergoing enormous public criticism, accompanied by policies that support deregulation and competition in teacher education (Gaffikin & Perry, 2009; Kumashiro, 2010; Zeichner, 2010). Within teacher education, pervasive neoliberal discourses and policies support marketization of teacher education (including the development of for-profit companies and

universities to prepare teachers) and shorter-term, often less expensive "alternative" routes to certification (Kumashiro, 2010; Zeichner, 2010). The reasons employed by proponents of neoliberal policies that encourage competition and the proliferation of "early entry" and "alternative route" preparation programs include that competition will improve the quality of teacher preparation (related to use value) while being in some cases less costly and more time efficient (related to exchange value). In effect, these neoliberal discourses and policies both increase competition for teacher preparation programs through the development and support of alternative routes, and also attempt to devalue the usefulness and worth of "traditional" routes to initial teacher certification, which consist of university-based coursework and supervised preservice field experiences (Kumashiro, 2010; Wilson, 2014; Zeichner, 2010).

A parallel and related development in the field of teacher preparation is the surge in policies that call for "more, and more rigorous, accountability of teacher preparation: better teacher tests, rigorous and more uniform teacher observations/evaluations, raising and unifying standards, improving accreditation, and holding teacher preparation programs accountable for the learning of the P–12 students their graduates teach" (Wilson, 2014, p. 188; see Chapter 2 for more about the accountability context for teacher preparation in the United States). This increase in accountability policies and associated teacher tests and other measures of candidate outcomes (e.g., edTPA; value-added analyses of teacher preparation using graduates' students' P-12 test scores) are aimed, at least in part, at measuring the worth (i.e., exchange value) of teacher preparation programs. Data use for external accountability—particularly data use mandated by state or accreditation body policy—is thus wrapped up in the exchange values of both basic economic survival and program accreditation.

The three TEPs in this study are situated in this context of increased competition through alternative route programs, criticism of traditional university-based teacher education, fiscal scarcity, and public accountability based on candidate outcomes. This manifested in a primary contradiction between the dual objects of internal and external accountability. Program leaders and members of all three programs articulated tensions between needing to comply with data use-related accountability policies in order to prove their (exchange) value, and their desire to use program outcome data (including new sources of data often mandated by state regulatory bodies or national accreditation bodies) for internal program improvement purposes. For example, a program administrator at ECU articulated their organizational data use processes in relation to external accountability pressures:

> In the past two-year period of time, we've been called upon as an entire system… to defend the quality of our programs… and be able to link data about best practices, about student learning outcomes, about persistence in a career, any of those things that can tie all the way back to a particular course are helpful in establishing that we're good—not just that we're good, but we know we're good and here's how we know we're good.

In the same interview, the program administrator also tied the need to "defend the quality of [their] programs" using data to the need for fiscal resources to support programming:

> That's one of the reasons why I sort of push relentlessly, because I really do believe that if we don't have something to show that is substantive in convincing that we're serious about making improvements and enhancements to teacher education, that there's going to be less and less willingness to invest.

In a process of expansive learning, the epistemic action of *questioning* involves "questioning, criticizing, or rejecting some aspects of the accepted practice and existing wisdom"

(Engeström & Sannino, 2010, p. 7). In these three cases, program members were questioning the wisdom of various external accountability pressures, policies, and mandates in light of their goals and values related to the object of producing well-prepared, excellent novice teachers and improving their programs towards that end. For example, the dean of the College of Education (COE) at ECU expressed frustration with many of the state accountability policies, noting a variety of unintended side effects in the implementation of new "value-added" metrics used to evaluate and rank teacher education programs:

> That's been my frustration. If you're going to collect data on us—fine and dandy. Then when we start making some changes, the state or whomever needs to be responsive in having an assessment office that's going to allow us to look at the impact of those changes on the student achievement of our later gradates or to allow us to look at those things that might have led to a below average performance or an above average performance so that we can begin to look more closely at how we might applaud that program [that led to an above average performance] and reinforce it and add it to others, or support a program that needs improvement.

The dean criticized the state value-added policies and systems because they were oriented primarily towards their exchange value (e.g., publicly ranking teacher education programs) without much use for programs interested in using the data for program improvement purposes.

The questioning stage often reveals a double bind related to the primary contradiction. Engeström (1987) drew on Bateson's (1972) notion of a double bind and interpreted it as "a social, societally essential dilemma which cannot be resolved through separate individual actions alone—but in which joint co-operative actions can push a historically new form of activity into emergence" (Engeström, 1987, p. 165). Interviews with program leaders at all three programs

demonstrated how the act of questioning the usefulness of external pressures and policies for data-related accountability policies in light of the relationship between internal and external accountability revealed a double bind. For example, the dean at Alverno articulated the double bind as "the difference between proving and improving. If you gather data to prove something, it's not going to be helpful to you. If you gather data to improve, it'll be immensely helpful." While program leaders in all three cases demonstrated commitments to using data to improve their programs, that did not negate the fact that in order to survive and stay accredited, they also needed data to continually "prove" their worth to state regulatory bodies, accrediting bodies, the general public, and prospective and current students.

When external pressures around data use mounted—as an example applicable for all three programs, pressures to use edTPA as a measure of candidate effectiveness—program leaders at each of the three institutions played a key role in turning those pressures into catalysts for change. As the dean at ECU explained that programs should "never waste a crisis":

> You're not going anywhere without dynamite, a huge catalyst for change, whether it's NCTQ[4]—and they have their role to play. They are moving and shaking the weeds and I'm not sorry. Value-added achievement says you can convince yourself all you want that you're wonderful, but your teachers, the teachers you're producing, are statistically significantly below average… That's a catalyst. The political winds are catalysts. Budget cuts are a wonderful catalyst because it forces you to say, we can't do things like

[4] The National Council on Teacher Quality (NCTQ) puts out a periodic *Teacher Prep Review* and other materials ranking and rating both traditional and non-traditional teacher preparation programs. Several scholars (e.g., Cochran-Smith, Piazza, & Power, 2013; Zeichner, 2011), some professional associations, and many university-based deans and practitioners have argued that the organization is biased against university-based teacher preparation programs, and its reports are very controversial in the field. For more about NCTQ, see http://www.nctq.org. For more about the controversy surrounding their reports, see Cochran-Smith, Piazza, and Power, 2013.

we did before… I think it was one of Obama's people that said "never waste a crisis." He was right.

Program leaders at all three programs, like the dean at ECU, used the "political winds" that emphasized data use and specific sources of data (e.g., value-added data, edTPA) to prove program worth—and the dilemmas, double binds, and conflicts that manifested from tensions between internal and external accountability—to motivate organizational change.

As I will return to later in this chapter, it's noteworthy that program members at all three programs continued to *reframe accountability* to emphasize internal accountability and prioritize internal inquiry over external compliance throughout the cycle of expansive learning. In this way they articulated the primary contradiction in their own terms, and as I'll demonstrate in the following sections, encouraged and orchestrated ways of changing work structures and processes to try to relieve tensions and conflicts created by the primary contradiction and to prioritize internal accountability and program inquiry over external accountability and program compliance. Even as the programs took actions aimed at resolving the contradictions that surfaced, the primary contradiction is always present, and never completely resolves (Foot & Groleau, 2011; Groleau et al., 2012). As it manifested throughout the expansive learning cycle, this discursive action of reframing accountability helped continuously articulate the object and corresponding object-oriented actions in terms of emphasizing internal accountability over external accountability, though of course none of the programs could afford to ignore the pressing needs of external accountability entirely. When the primary contradiction manifests as tensions or disturbances between nodes of the activity system (e.g., between the object and the division of labor), these are considered secondary contradictions. In the next section I describe how the primary contradiction manifested in concrete ways within the three TEP activity

systems, spurring transformation of work practices within each program. While there were several examples of secondary contradictions related to the three programs' different state and institutional contexts and histories, I focus primarily on the role of edTPA (and also PACT at UCSB) within their organizational change processes.

Secondary Contradictions: Using Crises as Opportunities

As the primary contradiction manifests in concrete tensions within the activity system, secondary contradictions surface between two nodes of the activity system. These secondary contradictions motivate actions to attempt to alleviate emerging tensions, and thus propel the transformation process (Engeström, 1987; Foot & Groleau, 2011; Groleau et al., 2012). In other words, during this phase the programs identified a threat related to external accountability that motivated a decision to change program practices because of their commitment to serving the expanding object around data use for internal accountability and program improvement.

As "the mantra of data, the use of data, continuous program improvement, and holding teacher preparation programs accountable" (Wilson, 2014, p. 188) intensified in state and national contexts, tensions developed in each of these three programs between the need to have many sources of program outcome data (as required or encouraged by state regulatory bodies, accrediting bodies, and/or public calls for greater accountability) to prove program effectiveness and their desire to approach data use from an inquiry orientation in order to best serve their candidates and improve their programs. This manifested as a secondary contradiction between an evolving object related to data use that prioritized data use for program improvement over data use for accountability and the available data sources (tools) that would allow them to move towards data use for program improvement.

This tension between the object and available tools was influenced by pressures to use edTPA as it gained increasing strength and credibility as a potential tool for widespread use with the potential to provide some coherence in measuring the effect of teacher education for the field. While all three programs began piloting edTPA before it was required by their states,[5] they did so in part because of their desire to learn how to best use and support edTPA to serve program improvement goals before the performance assessment potentially became required by external accountability mandates or consequential for candidates.[6] The proactive nature of their approach to edTPA (and other external accountability measures) is an important element of the way program leaders at all three programs attempted to maintain a sense of internal accountability in the face of mounting external accountability.

A faculty member and program coordinator at UCSB asserted that as a program, they are "not afraid of data." He hypothesized that this attitude has to do with their history of involvement in the development and piloting of PACT wherein their voices were heard in the process of creating and revising the assessment:

> There is a cultural norm here that … we're not afraid of what those numbers are going to say. From my classroom background, secondary school classroom background, that's different. When I came in, in those early PACT years, I was thinking of my [K-12]

[5] California has had a requirement in place since 2008 that teachers use a teacher performance assessment and as of August 2014 edTPA became a state-approved performance assessment option for preparation programs. In Wisconsin edTPA became required for certification in September 2015. There is still no state policy related to edTPA in North Carolina, though currently there are 25 teacher preparation programs in North Carolina piloting or implementing edTPA. See http://edtpa.aacte.org/state-policy for more information.

[6] EdTPA is gaining influence quickly. Currently there are 694 Educator Preparation Programs in 38 states and the District of Columbia participating in edTPA. Fifteen states have a policy in place requiring use of a performance assessment (with edTPA as an approved option) for teacher preparation programs, and several other states are considering implementation policies. See http://edtpa.aacte.org/state-policy for more information.

colleagues who felt they were getting beat up with those numbers, and we've never felt beat up by those numbers, and we're not talking about going after them with a hammer.

When asked why they're not afraid of data, he responded:

My first hypothesis would be that we were in on the ground floor of PACT, and in those early years, we could communicate back to the consortium and say, "You've got to redo this rubric. What do you mean by academic language?" There was a sense of dialogue.

While all three programs didn't have exactly the same relationship to the development of edTPA, their involvement piloting edTPA and providing feedback to the creators allowed them that "sense of dialogue" that fostered a sense of collective agency.

This secondary contradiction between the object and available tools corresponded with the epistemic action *analyzing*, leading to sharper questioning and aimed at discovering and defining the problem. Program members analyzed the accountability landscape and looked for data sources that could be used as tools towards program improvement. For all three programs, one of those tools was edTPA. The decision to pilot edTPA by each program was strategically motivated to be able to provide feedback to state policymakers and the creators of edTPA.[7] In addition to having formal and informal opportunities to provide feedback through the piloting and field testing processes, each program had program leaders participating on various advisory boards and panels for edTPA: a dean from Alverno participated on the edTPA National Advisory Board; the director of assessment at ECU and an associate dean at Alverno participated on the edTPA Standards Setting Panel; and the TEP director at UCSB and a dean at Alverno participated on both the edTPA Policy Panel and the edTPA Final Panel (Stanford Center for

[7] A decade before their pilot of edTPA, UCSB participated in the PACT Consortium for similar reasons. It eventually became state mandated, though UCSB had participated in the piloting process beforehand. UCSB program leaders and members had been part of the creation and refinement of the assessment.

Assessment, Learning and Equity, 2013). In addition, program members from all three programs had other roles and opportunities for feedback related to participating and/or collaborating on scoring and benchmarking trainings at state and national levels, as well as participating in edTPA implementation conferences. After their first year of piloting edTPA, the TEP director at UCSB facilitated a conversation at a program-wide data retreat centered around analyzing their edTPA data about whether program members would want to continue using edTPA or go back to using PACT the following year. When asked about her reasoning for this conversation with all program members, she said: "I want to hear from them. I want to be able to take what they're saying back to [the California Commission on Teacher Credentialing] and to other conversations that I've had with people on this." All three programs created ways not only for program leaders to have a voice in policy and implementation conversations at state and national levels, but also other program members such as faculty.

Each program's decision to pilot edTPA was partly, but not entirely, related to state and national pressures to use edTPA along with other more general pressures around measuring program and candidate outcomes. The dean of the College of Education (COE) at ECU explained that for them, "evidence development is policy driven. You have to have evidences. Our Department of Public Instruction says you must have evidences for each of these standards and you have to tell us what they are and then you have to gather them on everybody and then we're going to come in and take a sample and see if our rating agrees with your rating." However, she critiqued this "North Carolina model of accountability," saying "the flaw in that is there are no comparable assessments that were ever required; rubrics were never validated or deemed reliable; raters weren't calibrated. So you have a system that speaks of integrity and accountability but it's significantly flawed." EdTPA was chosen (despite no state policy around

edTPA use) partly because of the research that had gone into its validity and reliability. It also helped them with their goal of complying with external accountability requirements "in the most effective, the most efficient way" because it allowed them to "use one evidence source for multiple gatekeepers," such as their Department of Public Instruction, and NCATE/CAEP accreditation.

Though they were clearly being strategic about fulfilling external accountability needs in "effective" and "efficient" ways, program leaders downplayed external pressures in order to foreground edTPA's use for program goals and their own sense of internal accountability. Speaking not only about edTPA, but about the increase in data sources and data use more generally (including edTPA), the dean at ECU said:

> I'm not responding to pressure. I'm not doing it because Kate Walsh[8] is breathing down our necks or the federal government is disappointed in us. I'm doing it because I believe it's the right thing to do and I believe if we are not part of the solution, we are part of the problem. If you believe that someone's breathing down your neck and you're doing it out of fear, the outcome is… not going to be positive… You're not going to do the things that are going to move your institution forward because you're going to be so worried about whether you've done what they've wanted me to do. One of the challenges that I see is that deans are just as afraid of data as their faculty, because they don't want to look bad and they don't want to look like they haven't done whatever they should have done, whatever that might be.

The dean further explained that the decision to engage in data-informed program improvement efforts, including the nationally prominent edTPA, was for her related to a moral imperative

[8] Kate Walsh is the president of the National Council on Teacher Quality (NCTQ) which ranks and rates preparation programs, as mentioned earlier in the chapter.

particularly for large teacher education programs that are responsible for teaching the bulk of the country's new teachers, and should be doing that in the best and most informed ways possible. She explained:

> If [large teacher educator] institutions can't change or don't see a way to change or don't have the leadership to do so, [evidence-based improvements] are never going to stick. I don't care what carrots or what clubs are out there [from the policy world], and right now, that's what they are, carrots and clubs… The problem is, if you're not elevating the whole damn profession, you are sunk.

The dean continuously stressed to program members that the changes they were making to encourage data-informed program improvements were related to both the necessity of the political accountability landscape and a moral sense of doing the right thing to ultimately better serve P-12 students.

Similarly, dean at Alverno College articulated how their strong sense of internal accountability and a "moral sense of purpose" guided program decisions, including edTPA (this statement occurred during a segment of an interview conversation related to their decision to use edTPA, but also indicates a stance that is broader than that specific decision):

> We really started our own sense of accountability and our responsibility communally to take responsibility for our students' learning before that was a push in the political scene. We come at that very differently. We really own it in a way that avoids, for the most part, a sense of "let's resist this because it's coming from the outside and it has nothing to do with us or it's very threatening to us." Whereas we look at it and say, "well, yes, we've been doing this and in fact wouldn't anybody who has a moral sense of purpose do this?"

UCSB had been implementing PACT (a performance assessment similar to edTPA in content and design) for many years when they began considering piloting edTPA. The TEP director talked about the dilemma the program faced related to whether or not they should switch from PACT to edTPA[9]: "I knew there were a lot of things that were important about edTPA that maybe meant that we should do it, but there were lots of other things, reasons why we shouldn't have done it." Given the dilemma and the fact that the TEP director believed the program was "smarter [together]" and that she was "smarter when I bring something to the table," she chose to make the decision a collective one. She brought the dilemma to all program members primarily at a program-wide data retreat and the decision to pilot edTPA "was truly a collaborative decision… the group really were the ones who decided to do it."

Once the decision had been made to pilot edTPA at each of the programs—and to revise or create and implement other assessments and data sources—the programs began the next epistemic action in the expansive learning process, *modeling* a proposed solution to address a secondary contradiction. This led to the next epistemic action, *examining the model*, or "running, operating and experimenting on it in order to fully grasp its dynamics, potentials and limitations" (Engeström & Sannino, 2010, p. 7). In this in case the model they considered and ultimately implemented and examined was edTPA, though each programs' process of adopting edTPA involved differing amounts of time and processes that involved returning to the questioning stage at various decision points, or after evaluating different possibilities for action. The beginning of edTPA implementation led to the surfacing of various tertiary contradictions within the existing activity system structures and the emerging work practices and processes.

[9] Program members across the board discussed the usefulness of having a performance assessment so at that point may have continued using PACT or edTPA voluntarily, but it wasn't actually a choice because the state required the use of one of a few state-approved performance assessments, which included PACT and edTPA.

It's important to note that the secondary contradiction between the object and the available tools led to the modeling of other potential solutions as well. For example, at ECU the COE's dean applied for and received the large TQP grant that supported the development of many program innovations and related assessments and data collection to help evaluate the impact of those innovations. These included assessments and research related to the ISLES curriculum, co-teaching, and Video Grand Rounds, among others (see Chapter 5 for more about the TQP grant and these innovations and assessments). At UCSB, program members were collecting an increasing amount of video data from candidates as well as more structured and standardized observational data from supervisors and using collaborative analyses of both of those data sources for program improvement purposes. At Alverno, program members continued to evaluate, revise, and expand on existing program assessments related to their abilities framework (see Chapter 5 for more about the abilities framework at Alverno College). They also implemented Wisconsin's newly mandated Foundations of Reading Test. In the next section, I focus primarily on the tertiary contradictions that surfaced related to the introduction of edTPA, but these contradictions take place in the context of other program changes and are inevitably related in proximal and distal ways to other new and evolving data sources.

Tertiary Contradictions: Reforming Work Practices

Tertiary contradictions occur "between a newly established mode of activity and remnants of the previous mode of activity" (Engeström & Sannino, 2010, p. 7). As programs continued the epistemic action of *examining the model* by experimenting with edTPA and then *implementing the model*, tertiary contradictions manifested as discordances between existing work practices and the demands of this new tool. In this section I first describe how difficult the incorporation of edTPA was for each program, based on their perceptions through interview

data. Then I focus on one of the tertiary contradictions that manifested in all three programs, between new data sources and other system tools used to conceptually and logistically manage data (new tools vs. old tools). There were several other tertiary contradictions, as changes to any existing activity system practice reverberate in multiple nodes of the activity system. I focus on one example in order to be able to describe the consequences of this tension for each program in some depth.

The Challenges of Incorporating edTPA. In general, incorporating a new performance assessment (along with other new data sources) created the biggest shift at ECU during the period of our study. Alverno had a long history of implementing internally created performance assessments, and UCSB had been implementing PACT for several years. However, as I'll describe shortly, even Alverno and UCSB experienced disturbances and tensions related to implementing edTPA.

The introduction of new data sources and increased data analysis and decision making was a particularly jarring for ECU. The idea that data—including, but not limited to edTPA—should be integral to decision making challenged the status quo in both the college and the university:

> There are some real decisions or some processes that are going to have to be smoothed out because it's not the way we've always done curriculum… it's like who makes the decisions? In all universities, curriculum is changed as a result of somebody's idea… it's never changed as a result of data. Now it could be as a result of some outside requirement. NCATE says you have to have this; the Department of Public Instruction says that you have to have a hundred hours. It's always done external agency, but it is never based on data. So we're never changing a class, adding a credit, subtracting a

> credit, dropping this requirement, adding that requirement as a result of knowledge or information.
>
> One of the outcomes of this work, I hope, is that changes in programs become data driven. Changes in coursework are data driven; we just don't change them because a group of faculty sit down and say, "I think we ought to add another course to the program." That's a real difficult switch because if you do a data pilot, then the question is you're changing the course, but you didn't go through the curriculum committee. So the question is, why would you go through the curriculum committee if you don't even know if it's going to work? Well, there's no mechanism in the university for pilot programs, pilot courses, experimentation. Yet, we're supposed to be generating knowledge. So I think we're in a whole new sort of uncharted territory. (Program administrator)

As the program administrator's words above suggest, evidence-based program improvement efforts involved a paradigm shift at ECU. Many aspects of the activity system and work processes needed to shift in order to accommodate the increase in data sources, including edTPA as well as data related to various TQP grant-funded innovations such as ISLES, Video Grand Rounds, or co-teaching (for more about ECU program innovations related to data use, see Chapter 5).

UCSB on the other hand had already undergone a huge shift in activity system processes following the implementation of PACT. In other words, this was not the first expansive learning cycle at UCSB; the first expansive learning cycle was sparked by a similar secondary contradiction between tools and the object when California began talking about requiring a performance assessment and the UCSB TEP began its involvement with the PACT Consortium.

Through that first expansive cycle of learning related to data use, the UCSB TEP's object began shifting and expanding towards using data for collective program improvement (for more about the PACT implementation and learning process at UCSB, see Peck, Gallucci, & Sloan, 2010 and Sloan, 2013). Since the primary contradiction is never resolved, it always has the potential to spark additional secondary contradictions and lead to a subsequent cycle of expansive learning. This is what happened at UCSB when edTPA started gaining credibility and attention nationally and the California Commission on Teacher Credentialing (CTC) began exploring edTPA as a possible state-sanctioned performance assessment option for state preparation programs. The secondary contradiction between the object of using data for program improvement and the available program tools surfaced again. The UCSB TEP considered its options, and ultimately chose to pilot edTPA.

Given the similarities between PACT and edTPA, the implementation of edTPA did not precipitate as many systemic contradictions as the introduction of PACT had. Following the introduction of PACT, UCSB addressed many of the tertiary contradictions that arose within the system by, for example, changing the division of labor, expanding the object to better serve inquiry and program improvement goals, and shifting community values towards collaboration among all program members (many of these changes are discussed in Chapter 5 and in the subsequent sections). A faculty member with a long history with the program spoke about how once the program began looking at "student data" and "sharing different perspectives that we saw in the data" through formal and informal collaboration, that "became a model for how we have gone about our work ever since. Where we look at student work, and use that student work to inform what we do." The practices shifted over time, but the process of orienting

organizational activity around data use for program improvement was already underway by the time they decided to pilot edTPA.

Alverno College had the longest history with the use of performance assessments; they'd been using various internally created performance assessments for four decades (see Chapter 5 for more information). Prior to adoption of edTPA, the teacher preparation programs had used an internally created portfolio-type performance assessment linked to candidates' fieldwork called Teacher Effectiveness and Student Learning (TESL). When they gradually transitioned from TESL to having all students pilot edTPA, they had to make some programmatic changes to ensure student success on edTPA, such as curriculum mapping to make sure their curriculum covered the necessary content and skills. However, it was not a paradigm shift given their historical use of performance assessments and programmatic data use practices aimed at student and program learning. As an associate dean said:

> Before the edTPA came and Wisconsin was taking about the possibility [of requiring it], we always had a performance assessment in our student teaching program… When we started to look at the edTPA, we just said, "here's all these already developed rubrics around the same type of teaching." We were able to just replace [our internal performance assessment rubrics] with [the edTPA rubrics] and our students… knew full well we were going to ask them that question: "How do you know you're making an impact?" The prompts and everything for the edTPA are highly reflective… For our students, that's second nature. They expect to be asked those types of questions but when you take it to a system that doesn't have reflection or self assessment—they're a key component—it's harder to get your head around how you can ask students to think like that.

Similarly, a different associate dean in education said:

> Our process of gradually adopting the edTPA has been smoother than what I've observed in other institutions for a couple of reasons, one being that we had a longstanding expectation of whole-class performance assessment within student teaching. Bigger and more significantly than that, we have an institution-wide disposition and orientation toward performance assessment so that even though we had this edTPA-like thing in student teaching that even before the edTPA, our students got to that with a whole lot of experience in, for example, using rubrics to self-assess, in self-assessing video of their practice, and that's true not only for teachers, but for philosophy majors, women's studies majors, psychology majors at this campus. It's not something that's unique to education.

Like UCSB, Alverno College had begun its expansive learning relative to using performance assessment data for program improvement purposes before edTPA began gaining strength on the accountability landscape. However, the introduction of edTPA precipitated some specific issues and dilemmas in all three programs, though these manifested differently and to varying degrees of tension depending on their programmatic histories with performance assessments.

Tensions Between New Data Sources and Existing Data Management Tools. The introduction of additional data sources, including edTPA, created growing tensions between the increased amount and types of program data and the existing technical tools to organize and manage data from various sources. These tensions also related to the expanded object of data-informed program improvement: as programs became more invested in strategically using program data to evaluate and improve programs, they needed tools that would allow increased individual and collective access to data and the ability to perform program-wide data inquiries and analyses. This secondary contradiction between new data source tools and existing technical

tools manifested differently in each of the three programs depending on differing existing infrastructure and data management supports.

East Carolina University. As ECU's commitment to data use for program improvement grew, they added several new data sources, including edTPA. Many of the other new data sources were associated with the TQP grant and also, eventually, with the Pirate Code conceptual framework[10]. These included the ISLES curriculum, Video Grand Rounds, co-teaching, and the coaching initiative (see Chapter 5 for more background on these initiatives and data sources). Given the size and variety of teacher preparation programs at ECU, each project was initiated at different times in different programs and then went through a fairly regulated scale-up process (see Chapter 5 for more information about the tools, such as MOUs, that were designed to assist the effectiveness, standardization, and scale-up of different initiatives. Figure 4 below is an example of edTPA's implementation timeline at ECU.

[10] The Pirate Code conceptual framework grew out of a slightly different tertiary contradiction between the increased data sources and the expanding object around program improvement. These tensions resulted in a perceived need for a conceptual framework that would weave together the purposes of each evidence source in a way that articulated coherence within and between ECU TEPs.

TQP/Pirate CODE Project Implementation Timeline

Teacher Education Program	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
	201180	201180	201230	201330	201330	201380	201430	201480	201530	201580	201630
Art Education											
Business Education											
Birth thru Kindergarten Education											
Dance Education											
Elementary Education											
English Education											
Family and Consumer Sciences Education											
Foreign Languages Education											
History/Social Studies Education											
School Health Education											
Physical Education											
Mathematics Education											
Middle Grades Education											
Music Education											
Science Education											
Special Education											
Theatre Education											

Implementation Timeline Codes

	Original Language	Current Language
	Not Involved	
	Problem Analysis	Squishy Pilot
	Prototype Design	Formal Pilot
	Field Test and Iterative Refinement	Refinement & Expansion
	Summative Evaluation	Scale Up
	Component Adoption with Evaluation Monitoring	Impact and Reflective Studies

Figure 4: ECU edTPA implementation timeline by program

The dean and administrators in the Office of Assessment and Accreditation recognized how moving towards a system that supported evidence-based program improvement required much more than the adoption of a particular tool: “the introduction of new sources of evidence required many changes… I think one of the challenges is that in order to change the conversations, to change the work, to change the culture, a lot of different things must happen. It

isn't just gathering evidence and isn't just using a TPA." One of the most important changes she identified was that "we needed to have a singular system of storage. We had all these systems all over the college, people had their own little makeshift databases, so we went with Taskstream. But I went with Taskstream because I want the data to be able to be used for research as well as for program development… and so if we had a singular system of data where our demographic data, our evidence data, our interview data, our exit survey data and all of that were housed, then our faculty could learn one system because there's a huge learning curve to using something like Tasksteam." The need for a data platform that could house all sources of program data and would facilitate faculty access and also the emerging program research and development agenda tied to using data for program improvement.

The increased accessibility of the data through the development of a data platform facilitated faculty engagement in data use at both individual and program levels. For example, an instructor in a program outside the College of Education talked about how having shared and electronically accessible data helped "change a series of methods classes":

> "Faculty: Now that we have electronic evidences from some of these classes we found some holes, [things] that we thought students were getting but maybe they're not getting in the way that as pedagogy people we would prefer. We moved some of our objectives from other courses in to pedagogy-based courses, so that's been helpful because we didn't quite have the communication between the instructors that maybe we should have, and that brought it into light, being able to go in and look at these evidences.
>
> Interviewer: Because of the electronic platform because it was shared and everybody could get at the same data, do I understand that correctly?

> Faculty: Yes, yes. The other thing were the progress reports. Previously, the progress reports were paper-based and it was really just the university supervisor turning them in to the College of Ed. I think the program director got summative feedback. Now we can see on all of our interns' [data] and some of their strengths and some weaknesses because those progress reports are electronically based. It's been a little bit eye-opening in terms of some things that we had just assumptions about and so it changed the way we're running our seminars, it's changed our methods classes, it's changed a series of methods classes really.

This excerpt suggests that having access to various forms of data from both coursework and fieldwork helped faculty address "holes" in their curriculum, and also helped programs see where they might not "have the communication between instructors" that is necessary to create a holistic, integrated set of program experiences.

Faculty and administrators spoke of many different uses for the shared data platform. For example, another faculty member emphasized how having an electronic database has helped program members see not just issues to address to improve candidates' experiences, but also those of program members such as faculty and supervisors:

> The other thing that we got from [having an electronic database] is sometimes we would have supervisors who had not done their progress reports in a timely manner, which was indicative for us programmatically of maybe we need to work on helping them give support to the students, and understanding that it wasn't just looking at our candidates but also looking at the use of our faculty in those ways. That's a really simple [example], but that was an indicator for us… When you have something like Taskstream you can

generate these reports relatively easily and we can use it in many different ways within programs.

While the shared data platform allowed greater access to various sources of data and facilitated program changes in "many different ways," the introduction of any new element to an activity system—even one like this intended to ease a tertiary contradiction—has unintended consequences for the whole system. In order to make sure the platform was used for its intended purposes, including accreditation reporting and programmatic research and development, other elements of the system were affected too. For example, the introduction of Taskstream precipitated further tensions, including the need for additional supports for students, faculty, and supervisors. An administrator explained:

> Some of the additional supports [related to Taskstream] provided for faculty, supervisors, and cooperating teachers came in the form of training and support for using the new database… Just simply using the tools… I sort of feel like we're through the critical mass of using Taskstream as our portfolio system. There are always new people coming in. You're going to have new university supervisors. We only just took the clinical teachers out of the loop. We've been trying to have them be an interactive part of the portfolio as well, but again, because it was taking so much overhead, we thought we only have so many resources and we need to use them this way. There are always people that need to be trained and there's always a need for support. I've been fortunate to have some great graduate assistants that handle the bulk of the support, but damn! They graduate! (Laughter.) You know?

The data platform required extensive organizational and interpersonal resources in order to make it accessible and usable by a wide variety of program members, and therefore also required

support from program leadership, including the dean, to create and fund those organizational and interpersonal resources.

Alverno College. Alverno College created its own database in 1999 to fill its unique organizational needs, including those related to its abilities-based framework and assessments. The system was built primarily to support the institution's dedication first and foremost to student learning and outcomes, and therefore the interface is oriented towards looking at individual students' work and data: "Its purpose is really to enhance individual student learning. It's not really for program review" (Faculty). It was also set up in ways that speak to Alverno's principles related to assessment; for example, it's set up so that students can't see feedback on their work until they submit a self-assessment. Faculty also worked to integrate not only the internal Alverno abilities framework, but also external standards such as the Wisconsin teaching standards, the IRA/NCTE reading standards, or the Council for Exceptional Children Standards. There were also "bins in the DDP for primary self-assessment from the student, primary feedback, secondary feedback, peer feedback" (Associate Dean). The system housed both internally created performance assessments and external assessments, including edTPA internally scored feedback.

There were many affordances of the system. Faculty spoke about how the DDP was instrumental in allowing multiple faculty, staff, and supervisors to see a common object, such as student work or faculty feedback on student work. All faculty across the college had access to all of the data on the DDP. However, faculty and administrators spoke about some shortcomings of the system, particularly related to creating program-wide reports. Program members had difficulties using the system for larger scale aggregations and analyses, especially of program-wide data; it just wasn't designed for that. An associate dean explained: "There are all these

places where you can put things, but it's attachment-based, so the system itself can generate, say, a list of exit portfolios from spring 2012 but it can't search within the Microsoft Word and PDF documents that are constituent of that performance." A college administrator added: "The system was set up to be transactional at the level of the individual, and whatever thought was put into the aggregation was minimal and not really supported." The college also wasn't able to continuously update the DDP internally (e.g., add additional features or functionality) because they didn't have the necessary combination of human and financial resources necessary for such an undertaking. The DDP also wasn't designed to house all sources of program data. Since it really was designed for the individual student, it primarily housed "key performances" that could show individual student development around internally and externally desired outcomes. This meant that other data, such as exit survey data, had to be housed elsewhere. In addition, it meant that faculty had to manage multiple platforms even for student work within individual courses (the DDP and Moodle). These system shortcomings disproportionally affected the teacher education and nursing programs, who "are the most externally accountable. We have to be able to show to external licensing agencies or national accrediting agencies our exit portfolios, our performance data, in ways that, say, a women's studies major has less needs to do" (Associate Dean).

At our first site visit, Alverno College faculty and staff were just beginning a year-long process of hiring an external provider to co-design an updated data platform with them. Prior to our second site visit, they were in serious talks with two potential providers, "both of whom are prominent in the field" and "both of whom are trying to get the account because of what it would mean for them in terms of our collaborating with them and building it" (Associate Dean). The

process involved getting a lot of feedback from multiple stakeholders about their needs. One of the competing providers, for example,

> They interviewed students, they interviewed faculty, they convened different kinds of groups, beginning students, ending students, different matrix, and so on… The end result was that we had a document of about I don't know, twenty five pages long, of different criteria but then we ranked as, must haves you know deal breakers if we don't have these, would really like to have, would be nice to have, don't really need, and so on. That was also done with faculty from various disciplines and then we had over the last four months I have been I no less then probably eight to ten hours of meetings and trainings and demos and engineer teams flying in from China to talk with us. It has been very elaborate. (Associate Dean)

Input from many stakeholders was an important part of the process both for potential platform providers and internally. As an instructional technologist said, "We don't know what faculty need—so we are involved with faculty to listen to what they need. I am gathering data from faculty on what the gaps are in the current model." Some of the major design goals that emerged from this research included: (1) ability to generate program-wide reports integrating multiple sources of data; (2) additional analysis functions (e.g., narrative transcripts); (3) the ability to house both a learning portfolio (including feedback from faculty and self-assessments) and a place for students to put selected artifacts into a professional "showcase" portfolio; (4) "a tech group that can keep updating it and keep making it vibrant and truly address almost instantly [desired changes] because [it] is pretty quick that needs come up" (Instructional Technologist); and (5) the ability to integrate a lot of qualitative data, including video.

The tension between internal accountability—oriented around local values and desired outcomes—and external accountability—oriented around state and federal criteria and the need for accreditation because "that is the only way you are going to make your graduates available for jobs" (Instructional Technologist)—was apparent in our conversations around the DDP replacement process. As a faculty member explained:

> Our first focus is always on the student and her learning before we look at the [program]. We want them to do both ideally, but any change we make is based on what we need here and not what somebody else is telling us to provide. We'll figure out a way to fight. We've been providing data for years without having a system that would pull it for us except to do it ourselves. But I do really want—this will be fantastic when we have to run reports. But ideally when we look at [the platform], we look at it for students.

All the faculty and staff we spoke to about the platform were adamant that the first priority was student learning. Their unique needs, such as narrative transcripts, meant that they needed to partner with a provider that could customize and co-construct the platform with them.

One of the main challenges of the process was that "unfortunately, as a very small tuition-driven institution, money is a huge constrainer as far as innovation here, especially around something that's as significant as a custom built portfolio system" (Associate Dean). They were able to partner with a provider who was a self-described "fan of Alverno" that could meet their needs and was motivated to work with them for the opportunity to develop additional tools that could presumably eventually serve other customers as well, though this decision and the implementation process occurred after our final site visit.

University of California, Santa Barbara. At UCSB the contradiction between additional data sources, including edTPA, and the increasing need to manage and organize data to better

serve program improvement goals prompted a different approach to resolving those tensions. UCSB did not have a centralized data platform like ECU and Alverno College, nor were there serious discussions about getting one soon (though at one point the TEP program director said that a centralized platform would be nice to have). Management and access to data were salient issues. Their approach to ensuring that data could be accessed by program members for program improvement purposes centered around shifting the division of labor and formal and informal "rules", including the introduction of periodic data retreats.

Their approach to data access grew out of a realization through their experiences piloting and implementing PACT for many years that the qualitative data that PACT and some other data sources provided was generally more useful for engaging faculty and making programmatic changes than the quantitative data program administrators engaged with for accreditation and state reporting:

> The data I think that have been most instrumental in providing programmatic changes has been more case study types of data, or looking at data at the level of student documents. Those have been most instrumental I think in our work. The types of data that we have to provide for these annual reports have to be quantitative and it's a different animal. Honestly, the faculty do not work as much with the quantitative data as I do. It hasn't been as much of a significant factor in terms of the way faculty are engaging with data. It helps me identify some broad areas where I might want to have our faculty focus, but it's been a long time since we've looked at a program exit survey together. (TEP Director)

Generally, the TEP director is the primary person who sees the quantitative data that is used for the accreditation reports. She wondered about "the utility of collecting [the survey] data… year

after year because… while it's been somewhat helpful it hasn't been as helpful as some of our other data sources."

PACT data was by far the most discussed data source among faculty, supervisors, and program administrators we interviewed. The TEP director explained that part of the reason the program has found PACT data so useful is that it offers different levels of data to explore:

> I think the most important data that we use is data... at the level of student documents. That's particularly where PACT has been useful for a number of reasons. One is that it does provide different levels of data that we can access. We can look at the overall pass rates, then we can look at the scores by rubric and get a sense of what's happening there. Then we can decide what documents we want to look at and what people might want to focus on.

The TEP director explained that a common practice with PACT data was to look at the scores to see trends that would help guide faculty's further exploration of the issue by looking at candidate work:

> The scores help us zero in on places that we might investigate further. The scores don't tell us… what candidates are actually doing when they're giving feedback to students. That's why we need to be sure that we're looking directly at their work.

Similarly, a faculty member and program coordinator also discussed how the quantitative PACT data gives a large program view, and also points to places to dig into the qualitative data. He described the way that this process of moving from the big picture to the details opens up conversations:

> The PACT data gave us this large view to help us think about academic language. We got smarter and we can look over time and our scores have come up. Then we look at

> this graph across the 12 dimensions they evaluated in PACT and go, "Hey, look at this one, this is now the low one in its assessment." That becomes the next one we start to build a conversation around.
>
> We can have it at that level with PACT data—graphs—and we can also have it at a different level where it's about our curriculum… All of us come and say, "What do we think about assessment? How are we teaching it in our own individual courses?" Again, you see this large view generated by PACT, those numbers opening up an opportunity for us to go and look really closely at more kinds of qualitative data and have those conversations.

There were several ways that faculty accessed these different levels of data—from quantitative aggregations of program data to individual candidate artifacts. This happened primarily through the creation of several collaborative structures, including data retreats, committee meetings, and "scoring week", as well as the integration of data use activities into regular program meetings. Particularly given the lack of program-wide data platform, this often required that program administrators (usually the TEP director, PACT/edTPA coordinator, or program coordinators) strategically choose what data to present to groups of program members and create digestible representations of those data.

For example, at the second data retreat we observed, the TEP director created several types of data representations to present to program members. Before she even got to the program data, she had to curate several supplemental background materials to frame the data for program members. As she explained:

> In order to get access to the data, there are a lot of supplemental materials that are required to… make it efficient. Once I start saying, "I'll provide some examples of

> candidate work in the edTPA feedback," that also requires that they certainly need to know what the feedback rubrics are. Then I want them to also look at what our PACT rubrics were for that so we can do some work with that… I'm really planning for efficiency and planning it in a way that people can actually access the work.

In order to plan "for efficiency" and so everyone had the necessary background information so they can all participate, she brought several edTPA and PACT rubrics, in addition to the edTPA guiding questions in each content area and the PACT guiding questions in each content area. One retreat activity was to compare the edTPA and PACT rubrics, so those needed to be easily accessible. Some of these materials were in handout form, and others were made available in a Dropbox folder.

The TEP director also brought several representations of edTPA and PACT data to analyze and discuss collaboratively at this data retreat (and at all three data retreats we observed). For example, she brought colorful data charts that included Pearson's edTPA scores[11] for each program, local edTPA scores for each program, and Pearson's edTPA scores for SST (the secondary education program) broken out by content areas. There were also comparison charts—if UCSB gave a score one below Pearson, it was marked in yellow. There were other colors indicating if UCSB scored one higher, two lower, or two higher. It was designed to "get a visual of how far off are we and which way are we going with this."

During the retreat, they discussed the differences between Pearson scores and their local scoring in both small groups and as a whole group (see section on quaternary contradictions for more information about these conversations). After several program-level conversations about

[11] Stanford Center for Assessment, Learning and Equity (SCALE) is the lead developer for edTPA, and Stanford University is the sole owner of edTPA. The university has an agreement with Evaluation Systems, a unit of Pearson, licensing it to administer and distribute edTPA. Pearson is doing the external scoring for the edTPA.

the data, participants are presented with some samples of student work, which had been emailed to all program members by the PACT/edTPA coordinator. The TEP director and PACT/edTPA coordinator picked four samples for groups to read and discuss—two that were scored low, and two that were scored high. They had this conversation related to two specific edTPA rubrics. They also had conversations looking back and forth between the individual student samples and the program-wide data. Each of the three retreats we observed included data at different levels, just as this second one did—from program-wide representations of the data to individual candidate artifacts. The TEP director strategically chose each artifact to facilitate useful conversations that could lead to collaborative data-based program decisions and improvements.

ECU and Alverno College also shifted their divisions of labor and formal and informal "rules" in some similar ways. For example, all three programs implemented periodic data retreats and other structures where collaborative data use work could occur; had some form of internal scoring of edTPA and/or other candidate assessments to give faculty direct access to candidate artifacts; and were strategic about which people would have primary duties around reporting requirements and how to make time and space for other, more collaborative and inquiry-oriented data use work to occur among a broader group of program members. At ECU and Alverno, a centralized data platform emerged as a promising tool and a priority for their human and financial resources. For various strategic and logistical reasons, a data platform was not a priority for UCSB. They made data accessible by using various other technological tools, such as the PACT/edTPA scoring platforms, Dropbox, email, and internally shared drives. They also relied on collaborative time to share both raw data and digestible representations of data analyses. Program members were also able to request data or reports from program leaders and the PACT/edTPA coordinator on an ongoing basis.

There were many other tertiary contradictions that arose in the wake of edTPA implementation for these programs. Tables 2-4 in Chapter 5 provide a summary of many of the changes programs made as they became more oriented towards using data for program improvement, and illustrates how all aspects of the activity system are interrelated in the actions and activities that take place within them (and between the focal activity system and neighboring activity systems, as I discuss in the next section). For example, tensions arose between the new tool (edTPA) and various program rules. At a data summit at ECU, several faculty members and administrators discussed tensions that arose between new program practices (edTPA) and existing program grading practices:

> Reporter from Group 1: One of the things we talked about in our group was the standardization of grading… How do we get on the same page with this?
>
> Faculty: That was also one of the recommendations from the edTPA group.
>
> Program administrator: How does that get made into policy? Are there some things in the edTPA that we can agree should be part of our grading of courses? Is writing analyses of teaching important enough so it should be part of the internship grade?

While the implementation of the edTPA did not require the Alverno program to make fundamental changes to its existing philosophy toward data use, program leaders felt that it raised the bar with regard to what the program expects of its students, and also what it expects from itself. The adoption of edTPA and its implementation into their existing evaluations encouraged faculty to question the usefulness of various assessment items and share their assessments with others. The edTPA also encouraged faculty to assess how well aligned their course offerings are with the assessment: "edTPA really helped us think through what we were covering in our courses and even just things like the language we were using to make sure that

we were being as explicit as possible" (Faculty). The process of assessing whether and how this new tool (edTPA) aligns with previously existing courses and assessments involved collective faculty engagement in the review of student data. In response, they changed some of the ways courses were offered and students advanced. The introduction of the edTPA also influenced supervisors' work with students by encouraging them to better align student training and assessment tools, such as observation protocols, with the edTPA.

In the next section, I discuss quaternary contradictions that arose between the three TEPs in this study and neighboring activity systems.

Quaternary contradictions: Managing Tensions With Other Activity Systems

When an activity system realigns in response to secondary contradictions, this leads to tertiary and quaternary contradictions as new practices potentially clash with existing practices. While tertiary contradictions occur within the focal activity system, quaternary contradictions manifest from tensions between an innovating focal activity system and neighboring activity systems (Engeström & Sannino, 2010; Foot & Groleau, 2011; Groleau et al., 2012). In the case of these three TEPs, there were quaternary tensions between their emerging practices and their relationships with state policymakers and accrediting bodies, the P-12 systems they worked with (e.g., schools candidates did fieldwork in), and with the makers of edTPA and Pearson, who was contracted to do the external scoring of edTPA and support scale-up efforts. In this section I focus primarily on the tensions that arose as the TEP activity systems shifted to become more oriented towards using data for program improvement purposes and both the requirement of external scoring of edTPA by Pearson and the growing power of specific data sources (e.g., edTPA; state-level value-added measures) in national and state-level conversations about teacher quality.

These tensions were clearly tied to the primary contradiction between internal and external accountability. As the object of using data for program improvement developed around internally desired goals and outcomes, programs faced dilemmas between their own emergent activities oriented towards internal accountability and evolving requirements around external accountability. A faculty member at ECU articulated concerns about the relationships between their institutional autonomy, edTPA, and state-level decision making about teacher credentialing:

> I think my concern about armies and navies is I don't want us to fall into the mindset that well, if this is what Stanford is putting out, and AACTE and everyone else is putting it out, then we can't challenge it. I don't think that's there yet, but it's so new and it is still evolving. When it stops evolving that's when I think maybe some of us are going to have some concerns. It's not just the Pearson thing, although any entity that has that much power is concerning, and especially within education. I think we are all pretty aware of that idea that while this seems to be something that works really well as one measurement, it can't be the end all, be all. That then becomes the fear of who says whether or not our students actually are allowed to get their credentialing. If this becomes that powerful, which is the state of North Carolina's decision… If it becomes that powerful, I think we need to be very, very careful that we aren't just hopping on the bandwagon and riding off with it.

She went on to describe their role as ECU program members in challenging a potentially "powerful… bandwagon":

> As long as we can maintain our personal autonomy as an institution and not allow someone else to come in and say this is what it has to be for somebody to be considered a good teacher, or a teacher who is worthy of being a candidate for credentialing. That's

> fine. I think we have to be vigilant. I think we have to be a little like watchdogs here and just say, "I don't agree with that so what are we going to do about that? How are we going to handle this disagreement?"

All three programs demonstrated a commitment to "[being] vigilant" in maintaining institutional autonomy in the face of rising external accountability. There were many examples of program members, particularly program leaders, being "watchdogs", advocating for both longstanding and emerging beliefs about the role data and assessments have to play in defining and evaluating teacher quality especially for credentialing purposes. For example, in response to frustrations about state value-added metrics not providing useful information for program improvement, the dean at ECU:

> [Went] around to every teacher education program [in the state] talking about the [state value-added] data and saying that it doesn't matter where we are; it only matters where we're headed. These data tell us perhaps where to look but it doesn't tell us what to do, and therefore, in order for us to make that commitment, and it shouldn't be based just on this outcome data. We should all be concerned about our students launching as quickly as they can because many of our teachers go to the East [area of the state], which is the most at risk academically in the state. So it's a moral imperative, right? Therefore, what I'm saying to them is, this just tells us our elementary program is above average. We should celebrate that, and we should do drill-down studies to try to figure out why. Well, we did those.

She and other state leaders, policy researchers, and deans and directors of teacher education in the state undertook a collaborative effort to do post hoc "drill down" analyses of the state value-added data set in an effort to make the state-level data more useful to programs. The

ECU dean was a strong advocate for this initiative, and while these efforts initially faced a variety of systems-level difficulties, they eventually did lead to more productive and useful analyses.

This desire to maintain institutional autonomy, especially around conceptions and evaluations of teacher quality, was clearly demonstrated during the shift from PACT implementation to piloting edTPA during our data collection at UCSB. The outsourcing of edTPA scoring to Pearson was a concern many faculty members and program leaders discussed in interviews and at data retreats we observed. A faculty member explained:

> I think the fact that the scoring is going to be outsourced was a concern because you're losing that power. Any time you turn that over to someone else that you don't even know you get some concerns about whether they're going to do it right. And that's one of the reasons that we've pretty much insisted that we do it in house as well. That's one reason we're doing a pilot so that we'll have a voice, and the only way we can really have a true voice is if we have a part in the scoring. I would imagine that we will continue to score even though it's outsourced… I don't think [edTPA] will ever not be read in house.

In addition to a way to "have a voice," scoring became an important space for conversations around program inquiry:

> I think that what keeps people engaged is [that scoring is] just a practice of the program for one… It's what we do, but the other part of it is that it is… part of our conversations that we have. People believe, see the value seeing the fruits of their labor as they are integrated across more authentic teaching. (TEP Director)

An additional purpose of scoring was to facilitate faculty collaboration, which many faculty members we spoke to explicitly valued: "I think the key there is also having somebody to talk to

about it, doing it together. It's not that they're alone doing their scoring and then that's it, they turn it in. It's the opportunity to talk" (TEP Director).

At the second data retreat we observed in May 2013, the TEP director positioned program members to help make the decision about whether to continue using edTPA, which they had just finished piloting for the first year, or return to using PACT (both PACT and edTPA were state-approved performance assessment options). They had just spent the bulk of the retreat time examining and comparing both external edTPA scores and internal edTPA scores, as well as looking at student edTPA artifacts and comparing edTPA and PACT rubrics. It became clear through their conversation comparing internal and external scores that they had more confidence in their local scoring (which they had been doing with PACT for many years). There were many comments about the lack of validity in the Pearson scores. Program members also shared many concerns, such as the tool not capturing the difference between academic and dispositional issues, and the 20 minute video clip of candidates' teaching "used to show so many things." They demonstrated their sense of agency in the piloting process when one program member proposed, "is an alternative that we suggest they have more mini clips?" This also led to a discussion amongst program members bout how to help teacher candidates capture relevant video under the current constraints.

When they began the conversation about whether to continue with edTPA or return to using PACT, many concerns emerged, including concerns related to external scoring. The following is an excerpt from field notes paraphrasing program members during this conversation at a program-wide data retreat:

12:50pm

Screen: How does edTPA compare to PACT.

TEP Director: We have some decisions to make… not today, but soon. To help us think about that, I have the prompts from both PACT and the TPA… I did not have time to do this analysis ahead of time… so I don't know what we'll find…

Lots of ensuing discussion of academic language issues: PACT much more demanding than edTPA.

The edTPA requires the video clip to show too much.

TEP Director: edTPA will be adopted as a state option… and Pearson will do the scoring.

Participant comments:

Sounds good! (joking)

Faculty/Program Coordinator: We do NOT want to outsource the scoring—we want to do our own.

Faculty 1: There is nothing to say we can't score some of them.

TEP Director: You said earlier this year, when we were doing the training/calibration, that the edTPA lost much of the richness of PACT. Less nuanced. What else?

The PACT consortium has been supported by grants that Linda Darling-Hammond got… there is a challenge around ongoing funding. Some of the UCs want to share some work samples to evaluate reliability. The big issue is ongoing cost and responsibility for maintaining the instrument.

Once it's a national test—does it go in the LA Times? Once it goes national, it becomes a tool to compare programs.

What happens if it is used to evaluate teachers unfairly?

Faculty 1: I think one of the big issues is whether we are scoring it ourselves… when *WE* score, we have more perspective. We know them better than they are on a piece of paper.

TEP Director: We have a long history of using PACT and scoring PACT… the Pearson scorers are new to all of it.

Faculty 2: What if we had a combination of edTPA and something local… something we develop for ourselves?

Faculty/Program Coordinator: We need to go back and examine our whole assessment system… we need to look at how the mandated assessments fit into the larger set of program assessments.

TEP Director: Whatever we decide has to fit with who we are and what we believe. Faculty have to look at the candidate work on the TPA—otherwise we are missing huge opportunities for program improvement.

Faculty/Program Coordinator: We have to pay attention to what we have seen in K-12 when assessment has been taken away from teachers…

TEP Director: We do great things… it's not just about edTPA/PACT.

The expansive learning process at UCSB, which has roots in their involvement in the PACT Consortium and their implementation of PACT, resulted in many changes to their program curricula, policies, data use practices, and assessment tools within their activity system. However, perhaps of greater importance is the sense of collective expertise and collective agency they have developed, which is demonstrated in the excerpt above (and will be discussed in more detail in the next chapter). Given their history with PACT, they felt they had *more* expertise than members of Pearson's scoring team in evaluating portfolio-based performance assessments, and

thus did not want to "[lose] that power" to score internally, as a faculty member articulated above.

The TEP director at UCSB played the role of the main "watchdog" or advocate for the UCSB program at the state level, just like the dean did for ECU. The program members' sense of agency, which came through in interviews and observations, wasn't unfounded. The TEP director had been a member of the California Commission on Teacher Credentialing (CTC) since her appointment in 2007. Her position meant that she had access to state-level conversations about teacher credentialing policies and changes, and also that she had a voice on that commission. For example, in her interview before the data retreat discussed above, she explained that she "[wanted] to hear" program members' thoughts, concerns, and experiences using and evaluating PACT versus edTPA. She said: "I want to hear from them. I want to be able to take what they're saying back to the Commission [the CTC] and to other conversations that I've had with people about this." Her involvement also meant that she was able to frame program-wide conversations around PACT and edTPA (including the one at the data retreat discussed above) with comprehensive background information about "state-level issues around PACT" and edTPA. She explained some of the issues orienting her own thoughts about the choice the program would have to make between the two assessments:

> I'll provide [background] for the faculty in terms of state-level issues around PACT. There are changes that have to be made that are coming down the pipe… Somebody's got to take responsibility for the changes that need to happen to ensure that scoring is more reliable, that we have PACT central that's well-funded and going to be able to keep the work going. Then, edTPA will get adopted in California… as one of the choices [for a performance assessment]. I'm sure it will. What is that going to mean for the landscape?

> A lot of programs, I'm sure, will switch over because the burden of scoring them will be taken off of the programs. Then does that mean down the road, there is a push and some avenues to have just one TPA for the state? If we go back to PACT, are we eventually going to have to make that change [back to edTPA]? There's a lot to consider.

Program members' feelings about external scoring of edTPA were not all negative. For example, a faculty member at Alverno talked about how, while "[they] won't ever stop looking at the edTPA," external scoring would be helpful because "we just won't have to do all the scoring every time":

> At times I think it will be good for us to see where we are in relation to where they are [i.e., compare local scoring with Pearson scoring], but it won't stop us from digging deeper. We won't ever stop looking at the edTPA, we just won't have to do all the scoring every time. We were doing that kind of work before this even became an issue, and that's the kind of work that we continue to do, you know? Looking at student work together as a group is something that's just kind of inherent to what we do, so we will continue to do that. So we don't feel like we're abdicating in that way.

In the same interview, an associate dean added:

> We're trying to streamline, because it's something where we cannot sustain and be healthy leaders if we are trying to do everything all the time. And so we have to be, I think, strategic about that.

So while the tensions between external and internal scoring did exist at Alverno, and some faculty did feel the perceived threat to their autonomy that program members in the other cases also articulated, they also recognized that there were strategies they could employ to

simultaneously benefit from external scoring and selective internal scoring and examination of the edTPA.

Program members, especially at UCSB and Alverno, spoke about the importance of the learning process associated with internal scoring. The process was an opportunity and tool for programmatic collaboration that facilitated the development of shared language and knowledge (Peck et al., 2010). In order to make edTPA work as a tool for collective, programmatic learning, all three programs engaged in some internal scoring efforts and local evaluation and analysis of edTPA data. These three programs' ability to, for the most part, transcend the tensions that arose between their own activity system's practices and the practices and policies of the creators and implementers of edTPA (e.g., SCALE and Pearson) was affected by the agency and voice afforded by the process of piloting and field testing edTPA (as opposed to implementing it by state mandate at a later time), as well as the advocacy efforts of program leaders. These advocacy efforts included state-level and national-level conversations with policymakers, members of accrediting bodies, program leaders at other TEPs,[12] and creators of edTPA at Stanford University. Speaking to their relationships with "colleagues at Stanford," the dean of the Alverno School of Education stated:

[12] For example, the dean at ECU was a founding member of Deans for Impact, an organization that "is committed to improving student-learning outcomes by transforming the field of educator preparation." The mission statement also states: "Members of Deans for Impact will ensure their preparation programs graduate candidates who are ready to teach and lead in ways that measurably improve student learning. Members will collectively advocate and provide evidence for the value of educator preparation, and they will drive innovative programmatic and policy changes at the program, institutional, state and national levels. Deans for Impact, as an organization, will support deans and other senior administrators at institutions of higher education who embrace and demonstrate the guiding principles through its network for sharing data, program designs, and strategies that support its mission" (http://deansforimpact.org/mission.html).

> EdTPA is so much like what we do. It was a delight to have our colleagues at Stanford share their thinking around the rubrics because that moved us a stage that we hadn't gotten to, of really refining what does it look like to five levels…[13] That gave us that bigger picture.

All three programs were committed to being part of larger conversations about teacher education and teacher quality—including how that is assessed in light of credentialing and accreditation policies—at the same time that they were deeply committed to internal inquiry about how to best serve their own students and improve their own programs towards locally developed and articulated goals.

Discussion

When external influences affect the practices and goals of activity systems, it can cause tensions and imbalances within elements of the activity system (e.g., within the "object"), between elements (e.g., between the tools and division of labor), or between extant and emergent practices, or between activity systems. These contradictions can drive the expansive learning process, opening up opportunities for development at many levels of practices. Foot (2001) explained that there are no quick fixes for contradictions that emerge:

> Contradictions are not points of failure or deficits in the activity system in which they occur. They are not obstacles to be overcome in order to achieve goals. Rather than ending points, contradictions are starting places. They are not "problems" to be "fixed," and they cannot be quickly transcended through technical solutions. In other words, throwing more money at a contradiction, establishing a new division of labor, or creating

[13] Each edTPA rubric describes five levels of competency.

> new tools won't make them go away. In fact… these interventions very well may result in the aggravation of existing contradictions or the emergence of new ones. (p. 63)

Instead of solving contradictions, actions taken by actors within activity systems aimed at an emerging and expanding object may alleviate tensions, but will also have repercussions for other aspects of internal and external activities. In this sense, they can spur cycles of expansive learning in which subsequent contradictions help reshape organizational responses to better serve the object. Since the primary contradiction is never resolved, there is always the potential for the emergence of new secondary contradictions and a new cycle of potential development.

In their study of a school reform process in San Diego that conceptualized the San Diego school system as a set of nested learning communities (e.g., district leaders, teachers, students), Hubbard, Mehan, and Stein (2006) explored how the process of collective workplace learning involved "messy unpredictability, contentious misunderstandings, conflicts, and even power struggles over values, beliefs, and implicit assumptions" (Hubbard et al., 2006, p. 8). Inevitable unexpected consequences resulting from change processes (in this study, related to policy implementation) led to these disruptions to normal routines, misunderstandings, and conflicts. They argued that "discontinuities between communities, although potentially troublesome, also represent opportunities for learning" (p. 17). Though they were not specifically using the CHAT concept of contradictions, this is true not only of contradictions, but also the smaller-scale conflicts and dilemmas that occur as manifestations of contradictions in everyday practice. Resistance and dissent, it follows, can signal the possible existence of a larger contradiction, and also be opportunities for participants to try to resolve the issue in ways that are potentially learning opportunities.

Statements of resistance, disagreement, and dissent in our data were particularly helpful in identifying contradictions and more minor tensions related to the change process, since "contradictions manifest themselves as problems, ruptures, breakdowns, and clashes" (Kuutti, 1996, p. 34). Program leaders in these three cases also listened to these cues of conflict and tension. Rather than looking at dissent as solely problematic (though at times it was), program leaders in all three cases recognized resistance and disagreement as a resource for identifying and alleviating tensions.

For example, many faculty members spoke about the how new data use initiatives and practices put significant pressures on their time, which was already stretched thin with other research, teaching, and service commitments. In most cases when these pressures became known, particularly by program leaders who had the power to make changes to program policies and practices, it resulted in shifts in the division of labor. This included both redistribution of faculty responsibilities in formal and informal ways, and also the addition of new or redesigned positions such as members of the Office of Assessment and Accreditation at ECU, the increased inclusion of staff at the Alverno Office of Educational Research and Evaluation, and the PACT/edTPA coordinator at UCSB. These changes alleviated some of the additional pressures on their time entailed by new data use practices, but didn't solve those pressures entirely. Faculty, supervisors, and staff will always have to juggle multiple priorities and potentially competing individual and program practices. Colleges and universities do not have unlimited resources to hire as many faculty, supervisors, administrators, and staff to "solve" issues around time pressures and competing job priorities.

Program members at all three cases discussed the productive role of dialogue and disagreement in refining program goals and ideas about the means to achieve those goals. For example, an ECU faculty member and program administrator stated:

> There's this kind of ethos… We [all] want good things for kids. You might have a different idea about it that than I do. I'm not going to make you agree with me… but if we care enough about kids then we certainly should talk about it.

Dissent functioned as an important resource in collaborative deliberations about the goals and processes of change. As another ECU faculty member said, "whenever there's dissent… usually there's an ounce of truth that comes from that dissent."

The way dissent was treated, particularly by administrators, had a significant effect on the extent to which an emerging culture of inquiry was viewed as authentic. A program administrator at ECU commented: "Developing these communities of practice where people really start talking about the work from the ground up… you have to have those real opportunities; they can't be fake." This authenticity became particularly important when program members with different roles, and potentially different levels of power and status, started coming together for data use activities oriented towards a common goal. A supervisor at UCSB described this dynamic when it's successful:

> I always have felt like a member of the family. We don't always agree, but we do bounce ideas off of each other, and our primary purpose is how can we do a better job with our candidates. We have our course instructors, we have the leadership, and we have our site supervisors all working together with a common goal.

Engeström, Keruso, and Kajamaa (2007) also identified two larger-scale types of discontinuities that could shape whether or not a process of expansive learning continued or was

abandoned for an alternative object. These "breaks" are "primarily stoppages, cessations of a process, when an effort is abandoned or just fades away," often related to the realities of "organizations where change efforts are fragmented into various projects and punctuated by all sorts of deadlines and arbitrary timetables" (Engeström et al., p. 321). *Directional discontinuities* are major breaks that "call for actions of joint historical analysis and modeling in which the alternative directions are explicated and argued out. If such actions are not performed and a competing direction of change is constructed outside or behind the back of the ongoing change effort, the overall cycle of expansive learning may fade away or be terminated" (p. 323). In contrast, more common *mundane discontinuities* may be mended by actions of *bridging*:

> When one small cycle of innovative learning efforts ends, there typically occurs a more or less problematic break in the overall process. Such a mundane discontinuity generally requires actions of *bridging* that enable the next small cycles to build on the results and experiences of the preceding cycle. Such actions of bridging span breaks and gaps in time and social space, between discrete projects or local efforts that have happened in the past or that may be taking place elsewhere in the organization. Bridging is thus an important ingredient of expansive learning. Without such actions, the process of expansive learning may disintegrate into a series of isolated fragments. (2007, p. 323, italics in original)

Engeström, Keruso, and Kajamaa (2007) identified these concepts in the context of a study of organizational change over 15 years in two Finnish healthcare organizations. They examined how these two organizations, faced with similar contradictions, implemented similar reforms. In the middle of their expansive learning processes, both cases faced similar nationwide political pressure to make an abrupt change. One of the organizations resisted the pressure and

continued on their expansive learning process, while the other organization abandoned their original reforms and complied with external pressures. For example, in Case 1, the first "break" occurred during the modeling phase of a cycle of expansive learning. The organization was experimenting with a new, more collaborative team model, but a break occurred when the new model did not take root. The "bridge" Engeström identified was that one team of practitioners out of six work teams in the organization continued the collaborative team model. A second break occurred when a new salary system was implemented, there was a shortage at work and related time constraints, and lack of support from management for teamwork. The second bridge was that the one team attempted to continue the collaborative team model despite the lack of support from management. However, the organization took a collective turn back to sector organization and this team was not successful in redirecting efforts back to the collaborative model. This case ultimately formed a broken cycle of expansive learning. Engeström and his colleagues (2007) stated: "We found no evidence of actions taken to analyze, model and argue out the confrontation between the alternative directions at the crucial juncture in 1999 and thereafter. The new direction came from above, the team-based model was left to die" (p. 332).

In Case 2, when activity system participants experienced breaks in the cycle of learning, including budget cuts, increased time pressure, and difficulty recruiting substitutes, the collaborative teams themselves bridged those challenges by redistributing workloads among themselves. A third bridge was cited as the adoption of a new building and a new training program. These bridges were successful in allowing the organization to continue their expansive learning process. Their findings suggest that the ideal-typical model of expansive learning, described in the introduction to this chapter, is not necessarily linear, and actions of questioning,

modeling, and analyzing can occur at later stages, and in fact sometimes must occur for the process of expansive learning to continue.

In the cases of the three teacher education programs discussed in this chapter, edTPA represented an important aspect of their cycle of expansive learning oriented towards using data for program improvement. In all three cases, the introduction of edTPA occurred in the midst of other internal and external factors that affected the process and could have represented mundane or even directional discontinuities. For example, ECU was in the midst of designing and implementing several program innovations with related new data sources (e.g., ISLES, co-teaching, and Video Grand Rounds). They simultaneously had to contend with the introduction of statewide value-added metrics, and impending expiration of the TQP grant funding. Alverno was also busy evaluating and updating their own performance assessments both against internal standards and updated external standards, such as those associated with Common Core. They also began implementing the new state-mandated Foundations of Reading Test. UCSB continued increasing their use of video data for inquiry purposes, and also had to adapt several times to changing California Teaching Performance Expectations (TPEs).

Any of these simultaneous projects, innovations, and pressures—and that was not an exhaustive list—could have represented breaks in their learning processes, and certainly all programs encountered disruptions and resistance along the way. Bridging actions kept them moving towards the expanding object of using data for program improvement. In both cases Engeström and colleagues (2007) studied, they identified the bridges at a systems level (e.g., a new training system was adopted), but did not examine *why*, for example, the one team in Case 1 that continued the collaborative team model despite setbacks did so beyond that the employees on this team "felt a real need for teamwork as they worked with lots of clients with multiple

problems" (p. 331). In Case 2, they cited the role of management actions as important aspects of bridging in their case, but did not discuss those actions in detail. In the conclusion to the article, Engeström and colleagues suggested that bridging involved "certain key actions repeated time and again. This applies most poignantly to actions of articulating and re-articulating the direction of change" (p. 333). In the next chapter, I take a deeper empirical look at what these "key actions" are to examine the nature, scope, and role of bridging actions. I examine how program leaders and other program members developed and employed several interpersonal resources and tools to bridge both minor and major disruptions, conflicts, and tensions that occurred not only from the outside at the collective level, but also between individual community members' motivations and the expanding collective object in the process of expansive learning.

Chapter 7: Bridging Individual and Collective Development in Activity: Interpersonal Resources for Expansive Learning

Introduction

All three teacher education programs (TEPs) in this study pursued a process of expansive learning oriented towards using data for program improvement during the course of our data collection. In Chapter 6, I focused on the role of contradictions in both upsetting the balance of existing practices and motivating and guiding opportunities for collective learning and development. In line with most research from an activity theory perspective, the contradictions identified and solutions proposed to alleviate systemic tensions and realign work activities were described primarily at the level of collective activity and organizational structures and resources. For example, when faced with mounting pressures to use a standardized teacher performance assessment (e.g., edTPA), each TEP attempted to realign structures and practices involving the redistribution of the division of labor, the emergence of new "rules" around collaboration (e.g., data retreats), and the introduction of new tools for organizing and accessing data (e.g., data platforms).

The analytic focus on these structural and organizational resources and supports for object-oriented work led to insights about sociohistorical supports and constraints for processes of expansive learning. However, if we only focus on that level of analysis, we miss the important role and contribution of interpersonal supports and resources. For example, in the last chapter I spoke of leaders' roles in discursively reframing accountability in ways that emphasized internal accountability and internal inquiry over external compliance during the expansive learning process, thus framing contradictions as opportunities to learn in locally valued ways. In this chapter, I discuss several related interpersonal resources, supports, and

actions that study data indicated were significant in motivating and sustaining organizational development aimed at the object of data-informed program improvement.

At the end of the last chapter, I discussed Engeström, Keruso, and Kajamaa's (2007) study of continuity and discontinuity in processes of expansive learning. This study found that when "breaks" in the form of mundane or directional discontinuities occurred, efforts to "bridge" the discontinuity were sometimes successful in continuing organizational development towards an expanding object. Other times, bridging actions were not successful and expansive learning processes were abandoned and an alternative object was embraced. The bridges that attempted to alleviate breaks in the cycle of expansive learning were identified primarily as systems-level decisions and actions (e.g., adopt a new training system). The authors suggested that "actions of articulating and re-articulating directions of change" (Engeström et al., 2007, p. 333) were involved, but did not examine or define what those actions were.

In this chapter, I expand on that key, though underdeveloped, assumption that individuals play key roles in bridging actions within processes of expansive learning. In activity theory there is a crucial but undertheorized relationship between individual agency and organizational development and change. Theoretical and empirical research in activity theory and expansive learning has primarily focused at the level of collective and systemic phenomena, ignoring or underspecifying the role of individual learning, identity, agency, and motivation (Engeström & Sannino, 2010). Institutional structures and resources do not create change; people do through their engagement in actions and activities. As a faculty member and program administrator at ECU eloquently stated, "It's the people that drive [the work], the resources that support it."

In this chapter I use the concept of *bridging* to examine the relationships between individuals and the collective in organizational change and expansive learning. In all three cases,

the TEPs faced crises, conflicts, and contradictions large and small, but despite setbacks and roadblocks each TEP continued to develop expansively around the object of data use for program improvement. My data analysis suggested five key bridging actions that served to continue joint work oriented towards an expanding object. These are: bridging individual and collective motives, bridging individual and collective agency, bridging individual and collective knowledge, bridging individual and collective expertise, and bridging individual and collective responsibility. Each of these bridging actions acted as interpersonal resources in the expansive learning process, serving to "[articulate] and [re-articulate] the direction of change" (Engeström et al., 2007, p. 333) and shift community values and norms in ways that supported change efforts.

Program leaders—people in positions of power in traditional hierarchies within institutions of higher education—played a significant role in creating, repeating, and revising bridging actions. However, as I will demonstrate in this chapter, other program members performed bridging actions as well, especially as community values and characteristics evolved during the expansive learning process. In some similar ways across all three programs, leadership actions and responsibilities became more distributed across program members in the course of their expansive development.

In the next several sections, I examine how program leaders and other program members developed and employed these five interpersonal resources and tools to bridge individual and collective development and agency in ways that motivated and drove object-oriented program improvement efforts. These findings resulted from analysis of all three programs. However, in the next five sections I focus on the case of ECU to explain the bridging practices that support object-oriented expansive learning efforts. The bridging practices could be seen at UCSB and

Alverno College, but they also appeared to be so well established at these sites that the practices were less visible than they were at ECU. Given that ECU was in an earlier stage of expansive learning, many of the challenges of data-informed program improvement work—and the bridging practices that attempted to resolve breaks in the learning process—were more visible and more widely discussed. The other two sites, which had the benefit of longer histories of structural and cultural change related to collaborative, inquiry-oriented data use, more clearly showed the *outcomes* of these types of bridging practices over time. In the last section in this chapter, I discuss the bridging practices and related outcomes at all three sites.

Bridging Individual and Collective Motives

As the collective object around using data for program improvement grew more concrete through their processes of expansive learning, all three programs needed to find ways to ensure that individual motivations aligned with collective, programmatic goals so that the work could move forward. The dean at ECU framed the tensions between individual motives and goals and the collective need to use data to improve their programs this way: "We can't produce professionals if we're all doing our own thing. That isn't going to fly. We all have to not only use data, but we have to converge around how we're going to act. That's where the rubber starts hitting the road." She argued that when faculty members focus solely on their own agendas—whether they are research agendas or the specific courses they teach or the field experiences they supervise—it can be to the detriment of the collective good of the program if these agendas are not aligned in a way that supports program-level frameworks and goals. The dean was, as demonstrated in previous chapters, dedicated to changing the institutional culture and structures to support research and development of their own teacher education programs using both internally developed and externally developed data sources to guide program evaluation. She

articulated her own role in moving towards this new object: "The deanship here has to be about convergence, has to be about bringing faculty together around program improvement."

The role of organizational narratives. The dean spoke about how "energizing" it was when faculty began to see the benefits of program-focused research and development for themselves *and* the program. Part of her strategy for engaging faculty in practice-oriented research and scholarship and helping them see the benefits of that work for themselves and the program involved constructing frequent and strong organizational narratives (Edwards, 2010, 2012). These organizational narratives "made public what mattered in practices, as the practices were developed, in order to take forward the strategic intentions of the reconfiguring [practices]" (Edwards, 2010, p. 31). They connected data use practices to the larger "moral imperative" (Dean, ECU) of their mission. These organizational narratives aligned strategically with common, programmatic goals that many, if not all, program members (e.g., faculty, staff, supervisors) could buy into, agree with, and co-construct because they related the work to the ultimate object in teacher education: improving the lives of children by providing them with excellent, well-prepared teachers.

While the purpose of the programmatic shift to new and increased data use practices served both external accountability and internal accountability goals (see Chapter 6 for a discussion of the *primary contradiction* between external and internal accountability), program leaders such as the dean foregrounded local goals and values in the organizational narratives that were used to explain the purposes and goals of the new work practices. This prioritization of local values reflected the leaders' own commitments to internal accountability and program improvement, and was also strategic in the sense that it capitalized on program members' own moral commitments and helped create buy-in for the work.

There was ample evidence from interview data that faculty and other program members heard the dean's organizational narratives and her message that as a program they should focus their research on practice in ways that benefit and improve their programs. For example, a program administrator asked to describe the increase in scholarship oriented towards program improvement explained:

> I think [the increased orientation towards program improvement]… is probably a manifestation of maturation, of our work around examining who we are and what we're doing as a research institution; that's a bit of a shift that I've seen over nearly 20 years. It's a result of a couple of different factors. One that simply can't be overstated is the dean's persistent message that we need to be studying more intently what it is we're doing… I think it's safe to say we got that message loud and clear on a number of occasions from [the dean], rightly so, and it has begun to take hold.

Several program members mirrored the dean's organizational narratives and articulations of the new object around data-informed program improvement throughout the two years of data collection. For example, another program administrator said:

> [The dean] has always said we're not going to be a big R1, but what we should be doing is studying what we know and what we know is teaching and learning. That's what this college does well, and so if the research is improving the field in teaching and learning, then that is kind of our gold piece there. Certainly people have other interests but that's our college interest.

The role of collaborative structures. In order to encourage more faculty to get involved in work towards this "college interest," the dean and other program leaders consciously fostered cross-role collaboration through both formal and informal collaborative structures

(described in Chapter 5 and Appendix D). The dean framed collaborative structures that foster cross-role collaboration in ways that highlighted how the processes of evidence development, implementation, and analysis could benefit both individual and collective interests:

> [Part of] the evidence development process was trying to get folks together that taught a similar course, maybe across departments or across programs, and trying to get some common methods among the evidence development and the process of assessment and so forth. That not only gives you a greater ability to compare and contrast, but it also allows you to start developing these communities of practice where people really start talking about the work from the ground up. You have to have those real opportunities; they can't be fake. You have to say: "This is going to mean less work for you, and if we come together and we talk about this and we develop one rubric, then we could use it for five programs." That's where it starts, is: "This is going to be good for you, because you're going to save yourself some time," because at first they think this is all nonsense anyway.

This excerpt is a good example of how structural organizational changes can facilitate expansive learning, but alone are not sufficient. There was additional work that program leaders took on to frame how these changes provide opportunities for both individuals and the collective. The dean's remark that "you [program leader] have to say, this is going to mean less work for you" helps people see how they might benefit individually from the work, while "if we come together and we talk about this and we develop one rubric, we could use it for five programs" helps people see how the work might benefit the larger program as well. These organizational narratives about evidence development, implementation, and analysis weave together individual motives with larger-scale program goals.

The various formal collaborative structures the dean and other program leaders created and supported required buy-in from the faculty to be productive for their program improvement goals. Another way program leaders tried to create buy-in for these groups and the collaborative data use work they entailed was to continuously remind faculty of their connection to the ultimate object of creating excellent novice teachers. The dean encouraged what she termed "research communities of practice", related to evaluating and improving individual innovations, such as edTPA, co-teaching, and ISLES (described in Chapter 5). She explained that:

> I'm also supporting what I call research communities of practice. What I'm saying is: "We are not an R-1 institution. An R-1 institution's primary mission is to prepare the professorate. We're a high volume teacher preparation and educator preparation institution. Our research should be wrapped around our teaching and our programming, and we should be doing that effectively, because if I produce an incompetent teacher, there are going to be more incompetent teachers that I produce because I'm producing seven times the teachers that [another program in the state] is." So this is an impact problem.

In this organizational narrative, the dean strategically linked these collaborative structures, through which faculty from different roles within the university come together to research their own practice using various program data sources, with a collective object that is compelling because it speaks to a moral imperative and aligns data use goals with the overall program mission and with the welfare and education of children across the state and potentially the country.

Other program leaders and administrators used organizational narratives that weaved individual and collective motives and goals together, too. For example, a faculty member and program manager said:

> When you are doing these things… to step back and say: "It's your fault," or "it's your fault"— that's not good. You need to say, "You know what? What's best for the students?" I think that's what the dean says. It always comes back to them. What's best for the students? That's a tough thing to argue.

The process of building buy-in involved strategic articulation and re-articulation of the object and the relationship of evolving individual and collective practices to that object.

Bridging individual and collective motives when there is dissent and disagreement. This discursive return to the object was pervasive in our interview and observation data, especially in the interviews where we asked about the nature and prevalence of disagreement or dissent at ECU. A faculty member spoke about the role of disagreement:

> I think there have been different issues, and people have responded in different ways to different issues. Of course when you get a room full of people from all sides and all walks and agendas, then there's going to be disagreement at some point. I know that I served on [the Council for Teacher Education][14] for many, many years and there were disagreements. Even I was part of one at one time, but it all comes back to the professionalism. I really, truly believe that in education everyone is very professional and we're all looking towards the same goal, which is: How can we help our students? How can we make them stronger?

[14] The Council for Teacher Education (CTE) is a group of faculty and administrators who "meet monthly and discuss the issues" pertaining to teacher education, including issues related to assessments and data use. One faculty member described it as "faculty driven… because we're closest to the students and situation."

She indicated a collective faculty investment in "how can we help our students," and suggested that this common goal helps orient solutions to issues and disagreements that arise.

Another faculty member talked about how he had been resistant to edTPA for some time, and had voiced his resistance to the assessment. Over time, he "changed [his] mind." He spoke about the process of changing his mind about edTPA:

> I sat down and looked at the [edTPA] handbook at the time, which was very much in a draft form, and I started to look at it while we're collecting data and what I began to realize was that the evidence that we were pulling and we were collecting was useless, or it wasn't giving us what we needed. Here was an opportunity to… show the ugly underbelly of what was happening… But at least we can grow the program, and that's what turned the corner for me, was that I could get what I needed to grow my students and to help them and to find out what I need to do better… but it took me a little while, it took some really looking at what we can get from it.

In the end, seeing that he "could get what [he] needed to grow [his] students and to help them" using the assessment data was what motivated his support of edTPA. He saw his own motives (e.g., "find out what I need to do better" to help his students) aligning with program development ("at least we can grow the program").

Making data available for individual and collective purposes. Faculty and other program members also began to use the increase in program data—and increased access to data, including through the data platform—for individual and small group research studies. This included both faculty and graduate students' research. A program administrator explained:

> Faculty and thesis and doctoral students would in the past have studied just whatever they were vaguely interested in… but as our data collection, and assessment, and accreditation

> work matured and became more visible… as faculty became more aware that those data were available, then it provided a rich, rich source of dissertation fodder. Students became more aware of that, and they were less likely to follow a research line that might've previously been that of the major professor, and more likely to begin to research a problem of practice.

A staff member in the Office of Assessment and Accreditation, who was also a doctoral student, talked about her own dissertation project focusing on a "problem of practice." She was examining ECU's online program data to look at recruitment, retention, and employment to explore how to best support students from nontraditional backgrounds (e.g. older students; students with children). It was one of several examples of individuals using program data to combine individual motives (e.g., get a doctorate) with collective goals (e.g., find out how to best train and support strong novice teachers, including those from nontraditional backgrounds). When asked about her research, she said:

> For me and it's not really about the individual research, it's more that this is my contribution to the college… Whatever outcomes come out of the study, then we'll take those implications and see, okay, well, maybe the survey that we've been giving… is not a good survey, or maybe we're not capturing everything we need to capture. Then we'll work with the Office of Assessment and Accreditation. Let's talk with the faculty, let's bring that back to our leadership teams, so then if adjustment needs to be made to the program or to the survey or how we collect data—it's very cyclical… It's not just okay, everybody feels good about this partnership, it's not that we sit around the fire… It's more of, okay, let's get down to the brass tax, what is it that causes these students to continue… that's where you build your research agenda.

Structural and organizational supports for individual and collective inquiry. Many program members also worked collaboratively on research related to program innovation and evaluation. The increase in faculty research was seen in an increase in conference presentations and scholarly journal articles. Structural supports, including funding for conferences, shifted to allow broader participation. The funding model shifted so that:

> It's not like [names faculty member] is first [author] on all of [the proposals] but there's an opportunity for everyone to be part of this and to share that— and we… are committed that this is not a [names faculty member] show, there's a bigger entity here that we're working on. (Faculty/Program Administrator)

The funding model encouraged "[opportunities] for everyone to be part of this." While "there's a bigger entity here that we're working on," conference presentations and publishing were activities that allowed individuals to get recognized and potentially help them receive tenure or promotion.

There were several other structures, norms, and policies that supported individual or collaborative inquiry that could facilitate program improvement. Many of these are discussed in Chapter 5. For example, there were small internal grants "made available to faculty to study certain things… which is a wonderful incentive, and there's a clear expectation that we need to be studying who we are and what we want to do, and how we know we do it well" (Program Administrator). One program administrator said, "I didn't give anyone a graduate assistant that wasn't working on a college initiative." Staff at the Office of Assessment and Accreditation helped organize many of the supports needed for different program improvement projects, including faculty buy-outs and graduate assistance. It was "a new way of allocating resources" (Program Administrator). Another program administrator said department chairs and the dean

were giving out discretionary money if "you were doing things that are part of… what the dean would say moves the research of the college forward." She continued: "If you are doing the work for the good of the cause then there is some additional money you can get," and noted that "that's a change from in the past."

These resources helped encourage program members to get involved with programmatic research and evaluation, but were also supported by the discursive and relational moves made by leadership to continuously articulate the direction of change and make connections between evolving program practices and both the larger object of preparing excellent novice teachers and the related object of using data for program improvement. Program members' engagement in data-informed research and development was also supported by program leaders and administrators consistent encouragement to use the data for individual and collective purposes. For example, this transcript from a co-teaching data retreat at our fourth site visit in June 2014 demonstrates how program administrators stated that the focus of that day's meeting was on collective program improvement, and also actively invited individuals interested in using the data for individual purposes to do so:

> Program administrator 1: You might be disappointed to know that [the purpose] today is actually not to give you hard data that you can use for research. I'll talk about where that might be a possibility if anybody's interested. The purpose of this [co-teaching data summit] is really for programmatic evaluation. To look and see what was happening in your programs and to get a sense of what the numbers are suggesting.
>
> Female: Mmhmm (affirmative).
>
> Program administrator 1: Every piece of data that we're giving you today is de-identified data… But that's not to say that if you're interested in… looking at some of these data

and writing it up, [names three program administrators and faculty members] and I have always said that we consider these data *our* data… Programmatic pieces could be given back to departments or shared between us and departments if you're interested in writing up some of these data and this information for something that works for your purposes or your needs. If that was the case we would need to add you into an IRB and get you approved on this, on the team for this. Okay, so [faculty member] is saying yes, and we'll come back to this conversation at the end.

Faculty 1: I'd like to be part of teaching when we do two to one. That's the part that I'm interested in, when we do two interns to one teacher. If we ever slice that out—

Female: Mmhmm (affirmative).

Faculty 1: That's the part I'd be interested in, either writing about or joining in an effort to present about something.

Program administrator: Did you ask for some two to one's this time?

Faculty 1: Mmhmm (affirmative).

Program administrator: Okay …

Faculty 2: That's another piece that's really important. When we ask for the data to be coded this year, it's like as we go along we learn so much.

Female: Mmhmm (affirmative).

The program administrator who was facilitating the meeting clearly laid out the purpose of the meeting as one of collective use for program improvement efforts around the co-teaching initiative. However, she also was clear that "if you're interested in writing up some of these data… for something that works for your purposes or your needs," that was a possibility for any program member as long as they got on the IRB. It's also noteworthy that a faculty member

pointed out how "[they] learn so much" during the data coding process. The data use work served both individual and collective learning. Later in the data retreat the facilitator circled back to remind people of individual and collaborative opportunities to analyze the data for if they were interested:

> Program administrator: The point is we're taking a very glancing blow at some of these data today. Like I said, should you want to come back in and pull some of these data with us and look at them yourself when you're on the IRB we can look at that, give a more focused look to some of these [data] if we're interested.

There were several ways that Office of Assessment and Accreditation staff facilitated faculty access to research for individual and collaborative uses, including managing and supporting the development and use of the data platform. They also were working on procedures to make sure faculty could access various sources of data in ethical ways, which involved working with the college IRB office, making sure all teacher candidates consented to various research projects in appropriate ways, and ensuring that sure there were ways for faculty to access de-identified data. A program administrator said of this shift to increased faculty data access: "I'm kind of excited about that because I've always said, I feel like we sit on a wealth of data in our office that we need to turn into more information for our programs and program improvement and faculty to use in their research. We need to have that shift. We're getting there."

Building relationships and trust. Program leaders made various program data available to program members, explained what data was available and how it could be used individually and collaboratively, continuously articulated program goals related to data use, and encouraged faculty to use data for individual purposes that also served the collective good. These bridging

moves were enough to significantly increase faculty buy-in and involvement in data use practices. However, when these strategies were not sufficient and individual faculty still resisted program changes, program leaders spoke about relationship-based bridging strategies to further help people see the benefits of changes for individuals and programs. These approaches were about building relationships, having "small conversations" and "critical conversations" with individuals, and "getting people slowly" (Faculty/Project Coordinator). One faculty member and project coordinator called one approach to this "huddles":

> The nice part about the TPA and the buy-in we have had with faculty across the program areas is that we've had discussions to start off. That's been my role as a faculty member to say: "Okay, here I am. I'm a faculty member. I want to introduce you to this assessment. Based on this assessment, here are some of our experiences with it. Then what takes place is what we call huddles. I huddle with different faculty members and I have discussions with them. It goes back to dialogue… building the trust factor, building that relationship, that we have mutual concerns, and really saying—not like a grant where you have to do something right away—how would this best fit your program? Over a period of time, because the state hasn't said we have to do [edTPA] right now. What can we look at and how can we give support? Out of [the director of assessment and accreditation's] office with the TPA, we've built a series of support; everything from technology support, the program support, the student support.

This conception of "huddles" is not about forcing implementation or buy in, but rather about "building relationships; that trust factor" (Faculty/Project Coordinator).

This faculty member, who also helped manage edTPA implementation and research as the edTPA project coordinator, also brought up important differences between grant-funded

innovations, such as the TQP projects, and unfunded initiatives such as edTPA at ECU. The TQP projects did have the advantage of being able to provide financial and other resource-related incentives (such as course buy-outs) to faculty participating in their development, implementation, and evaluation, but the downside to that was the need to potentially curtail individual agency to increase engagement under a potentially stricter timeline (see the next section for more discussion of tensions between individual and collective agency). The edTPA project coordinator argued that unfunded initiatives such as edTPA, which didn't have resource-related incentives to offer, needed to rely primarily on dialogue and building trust to generate buy-in—though they did also need to offer "a series of support" for faculty and students primarily through the Office of Assessment and Accreditation.

The edTPA project coordinator, who was also a faculty member in the College of Education, believed that his position as a faculty member (rather than solely as an administrator) was an advantage in trying to build support for edTPA through dialogue and building trust. His approach aimed to communicate a sense of what the opportunities were for individuals to speak their minds, allow them to investigate the opportunities related to edTPA, and be able to contribute to the project through engagement and/or productive resistance. He articulated how his position as a faculty member within university-based hierarchies and power dynamics supported that approach:

> [I have these conversations] one-on-one and in small groups. As a faculty member, I have that bridge. If [the director of assessment and accreditation] was to do it, or somebody from her office was to have that conversation, [it might not work] because there is still that tension no matter what university you are at between tenured, tenure track, or being fixed term [faculty]. Being here long enough and working with faculty,

> it's those small conversations that do it… Working with friends I say, "I know what your beef is, okay. We showed you the stuff two years ago. We gave you a heads-up on this. We know it is going to affect your program area. Here's your chance to really come on board and take a look at some of these things. Really inform us because we are going to make some major program decisions here based on data." I said, "If you sit on the sidelines, you are going to watch your program dissipate."

I interpret "I know what your beef is" to mean that he listened to individual faculty motivations and concerns, understood and respected them, and gave them a "chance to really come on board" and have a voice in the project. In the next section I describe some approaches at ECU to giving program members a voice while also managing tensions between individual agency and collective goals.

Bridging Individual and Collective Agency

There's an important relationship between bridging moves that attempt to align individual and collective motives and those that attempt to transcend divisions between individual and collective agency. In this section I focus on how individual interests and the desire for agency can potentially clash with collective goals and even shared conceptions of common object(s). I return to the important role of dissent and disagreement (also discussed in Chapter 6 and the previous section), especially when individual and collective motives haven't aligned (sometimes despite bridging attempts such as those described in the last section) and faculty members perceive administrators and program leaders as "[having] a different vested interest" than them (Faculty).

Addressing resistance productively. There were many examples of program members finding alignment between individual and collective motives and therefore engaging in the

collective work around data use for program improvement. However, there was also evidence of considerable resistance and dissent at ECU. For example, the dean identified issues that faculty members were raising related to an increased workload and the speed of implementation of new innovations. She considered these legitimate issues and was working to address them during the span of our data collection. There was also resistance related to programmatic attempts to bring together pieces of the program—related either to the curriculum or structural aspects of coursework and fieldwork—that were previously in relative isolation. Attempts to integrate or align aspects of coursework and fieldwork resulted in some perceived threats to autonomy and academic freedom. The dean talked about how she approached these concerns:

> I said [to some faculty concerned about academic freedom], "I'll tell you where I stand. Academic freedom was never created so that you could teach whatever you want to teach. It was created to give faculty the opportunity to study politically unpopular [topics], to pursue truth, so it might be McCarthyism in the '50s or Ku Klux Klanism in the '20s or abortion in the '50s, but you can't prepare a professional [if you can teach whatever you want to teach] and you can't use academic freedom as the excuse not to be a member of a team. Team doesn't have an 'I' in it. That's where I stand. Now you can challenge me on that, but I'm here to tell you, I will believe until the day I die: we are not going to produce high-quality teachers until and unless we can come together around a set of goals, activities, assessments, outcomes and processes. That's what we're struggling with, because we don't know how to work like this. We don't have longstanding experience. Each of you have had autonomy inside your class, just like the teacher has had autonomy inside her classroom. That has to go away in part."

The dean articulated the tensions between individual and collective agency as problematic when faculty members want to have sole authority over an aspect of the curriculum in a program trying to prepare professionals who are and should be accountable not only to internal, collective conceptions of good teachers, but also to external conceptions of good teachers (e.g., those promoted by edTPA or accrediting agencies). The dean argued that they needed to shift away from complete faculty autonomy to a system where they could "come together around a set of goals, activities, assessments, outcomes, and processes" and both conceptually and practically align the experiences and content of the teacher education programs.

Increasing stakeholder voice through listening practices. While ultimate faculty autonomy would "[have] to go away in part," the dean argued that it would be for the sake of programmatic coherence and working together towards a common object. She expressed a strong desire for individual faculty to collaborate and work together in new ways. In some ways this meant faculty might lose absolute authority over the aspects of the program they taught or oversaw, the process she suggested did not involve a complete loss of agency for program members. She articulated the desire to implement a change process in which program members had a voice in the set of goals, activities, assessments, outcomes and processes that they were converging around:

> What we need to learn to do is how to get the voices into the process. I said [to the faculty], "I'll take the blame for this. I think the speed of the changes is probably one of the problems. When we find things aren't working, we should have a semester of piloting where not everybody has to change, because that'll give us a chance to talk it through to come up with an idea, but not to change everything, because we're talking about a big program."

One of the leadership strategies the dean employed to get more "voices into the process" was carefully listening to faculty resistance and concerns. In an interview held during the third site visit, the dean paraphrased her response to some faculty members who had raised concerns in a program meeting the day before: "I said, 'You may not agree with me, and we can have additional conversations because we're not going to be able to do this work until and unless we come to some kind of understanding.'" She recognized the need to align motives and understandings in order to ensure that program members were working together cohesively. The need for program leaders to *listen* to program members, and the usefulness of program members feeling truly *heard* by program leaders was a strong emergent theme, and an important element of bridging practices.

When three internal chair searches surfaced faculty issues and complaints, the dean stressed the importance she placed on listening to those concerns and addressing them. The dean talked about the need to both "hold your ground" and also listen to everyone. She paraphrased herself in discussing her response to both faculty members' general concerns and those specific to the chair searches:

> "We're going to go ahead with this search, but I'll tell you what I'll do. I will interview everybody in this department and I will see what everybody thinks, and I'm not going to do it in a focus group and I'm not going to do it in a forum, because I want everyone to feel perfectly free to say what's on their mind and what's going to come out of that are the issues, not the people. So I will be calling you for individual interviews because I'm hearing different things from each of you." I did that—[it took] 20 hours—but you've got to do it… I told them, once I get everybody's input, I'm going to come back to the

> department and hold a meeting. We'll talk about the issues and we'll get this out on the table. That [meeting] was yesterday afternoon.

She spent 20 hours listening to faculty's interests and concerns. At the meeting she mentioned above, she paraphrased that she told faculty:

> "I want to start the meeting, number one, by saying that I'm very grateful that each of you took the time to talk with me, and I hope you know that I did take it seriously. I've tried to listen and so today, you'll come to understand whether I really heard you or not because I'm going to share with you the big ideas. I'm going to share with you what I agree with and what I see as being very important and things we need to talk about, and also things I'm questioning."

There was widespread agreement amongst faculty—with some notable exceptions—that the dean listened to them and they felt heard, even if she didn't always find a solution that worked for everyone. This relational aspect of her leadership also required being "in the weeds" and interacting with and listening to faculty in various ways:

> To do this kind of work, you have to be in the weeds, like going to that faculty meeting, because you don't have a hammer… You only have influence. You have to say, this is what we want to have happen here, and this is important, and this is why it's important and we have to produce good teachers and I'm not going to be satisfied with average teachers, not as long as I'm here.

This statement demonstrates once again how she tried to affect faculty investment and engagement by attempting to convince them to buy into the collective object of this collaborative work (i.e., explaining "this is why it's important and we have to produce good teachers").

Several program members spoke about feeling heard by program leaders, including the dean. For example, a faculty member in a focus group stated:

> There is a perception in our college that the dean sometimes doesn't matter, that the dean doesn't know what's going on. But she can name it by person: who works, who doesn't work, because she listens and she just pieces it all together. People go meet with her and say crazy crap and she listens to them and she'll chat with them, like "well, yes I think you are part of the problem; why don't you become part of the solution?"

Faculty interviews and focus groups demonstrated that disagreement and how program leaders handled it was key to their sense of individual agency, especially when faculty members perceived administrators and program leaders as "[having] a different vested interest" than them (Faculty). When asked if they felt like they could speak out if they didn't agree with something going on, another faculty member said, "You should hear our meetings. Yeah, yeah. Absolutely."

In a focus group with faculty members identified as being resistant to implementation of various data use-related projects, we heard a lot of concerns about program changes, including many that were also discussed by program leaders. For example, there were concerns about edTPA having too much power in the program:

> My sense is that what we've done is to lose the focus of what we're really trying to do, to prepare top-notch teachers. Now what seems to be the emphasis is let's not prepare top-notch teachers, let's prepare top-notch edTPA producers, because those numbers make us all look so good. We're sort of using that… to justify bad choices that really don't reflect well on our students. The long lesson plan, extra things dumped in courses because this will help our students when they get to edTPA, and this will help our students, and this

> will help our students. If it's dumped in two weeks after the semester has started, that really doesn't matter because it will help your students. It's like anybody's bad and unprofessional behavior can be justified because "it will help our students." To me, what it does is to not help our students because it detracts from the overall quality and work that faculty have done to get our students ready for this. (Faculty)

This excerpt demonstrates the downside of organizational narratives such as the ones that relate new program processes to an emerging object. In some cases, these organizational narratives were read as ingenuous or inauthentic. Clearly this faculty member was not buying into the organizational narratives articulating program leaders' and some program members' beliefs that edTPA, and research based on edTPA, could help program members evaluate and improve their programming in service of producing better-prepared novice teachers. In the same faculty focus group, another faculty member talked about how what's sometimes used as an organizational narrative about the ultimate object (i.e., doing what's best for kids) can come off as a "trump statement" that is perceived as manipulative: "The trump statement is, 'we've got to do what's best for the students'… I mean, how do you dispute that? You have to do what's best for the students."

Creating a sense of collective agency over time. For some faculty members the process of aligning goals and buying into the collective aims of particular projects and the larger agenda around data-informed program improvement just took more time; program members needed time to evaluate their thoughts about new processes, practices, and tools and/or needed more bridging conversations. For example, one faculty member talked about how he came to embrace the mission of the many different teacher education initiatives being implemented concurrently, despite the sense of overwhelm he felt initially towards these projects:

> I think it goes back to the sense of that's who we are; we are teacher preparation. You talk about other places on this campus, and they are fantastic programs, but they don't see themselves as having to cause… but the expectation here is that we need to constantly move forward, and I think that's where these interactions can easily be stifled…
>
> I'm an advocate of edTPA [now], but I was the one in the meeting about edTPA, I'm like, "I don't know." I shook my head and I said, "This is just…" In fact I was in a meeting and this a direct quote, we're in there to talk about TracDat[15], TPA, TQP and something else, and I at one point said, "I can't take another word that starts with T. Can we just not use T words here?" Because it just was one thing after another… but the expectation was that we're going to move forward. We're not going to sit and to be stagnant, and once I got into it and I got out of the way, I saw this is going to grow us some.
>
> I think that environment—and the culture of the leadership provides that environment—let's constantly look to the horizon… Particularly in this college [of education], we've always had leaders that have said, "Let's continue to look forward. What do we need to do to stay ahead of that curve so that we're not being reactive, we're being proactive?"

This faculty member spoke not only of buying into the "cause" of "[moving] forward" using new tools and work practices, but also of embracing a sense of *collective agency* that this attitude towards forward-facing growth facilitated.

Program leaders who invested in various tools and activities (such as edTPA and other internally created sources of evidence, as well as data platforms to help manage data access and

[15] TrackDat was a university-wide data platform.

use) were also "being proactive" about addressing both internal and external expectations around accountability and program improvement.[16] The above excerpt, and others like it, showed that faculty and other program members (e.g., supervisors and program administrators) appreciated the collective sense of agency that approaching accountability in a proactive, inquiry-oriented approach afforded. For example, program leaders chose to pilot edTPA when it had started to gain national attention and had begun being mandated in some states, but was not mandated in North Carolina. This allowed them the time and space to evaluate its use for internal and external accountability purposes (e.g., internal inquiry and program development; accreditation) without needing to force all programs and program members to participate right away.[17]

The dean spoke about how their approach to implementation—which involved many deliberate and institutionalized steps to scaling up program innovations, including iterative cycles of evaluation and program development[18]—allowed time for program members to try to bridge individual and collective motives and agency in order to build buy-in for data-informed program improvement:

> EdTPA was in there as a pilot because I was saying that the reliability and the validity of data is going to be critical to any of the conversations we had. Well, the middle grades [who first piloted edTPA]… they came kicking and screaming, but now they're the champions. They see the value of edTPA. They recognize what it's beginning to do, not only for program improvement, but they now see the opportunities for research around

[16] See Chapter 6 for more information about proactive program decision-making related to external pressures around accountability and the desire to maintain internal accountability.
[17] See Figure 4 in Chapter 6 for the timeline of edTPA implementation at ECU, and Appendix E for implementation timelines of several Pirate Code projects.
[18] See Chapter 5 for more information about ECU's processes for moving innovations from "squishy pilots" to participation by all programs, including ongoing research and evaluation processes. See also Appendix E for timelines of several ECU data-related projects, including edTPA.

> practice that are there. So last year, elementary and special education came on board and last year about 400 students did edTPA. We went from like 50 students to 400; it was a huge scale up. We had English and history and middle grades in the first round. Elementary and special ed joined this year. Now there are conversations this summer with business ed, music, math, and science.

As more faculty became involved in the process of data use—some more willingly than others—the dean described how people began to see the truth in her statements about the potential benefits for individuals as well as for the program. Once faculty began noticing "the opportunities for research around practice that are there," more faculty members and more programs joined different projects related to data use.

Productive versus unproductive resistance. A department chair discussed her conception of the difference between disagreement and dissent. Her distinction sheds light on the difference between resistance that can be productive for object-oriented expansive learning and resistance that is harder to overcome:

> To me there's a difference between disagreeing and dissent. I think that's something that I've really tried to work with my faculty on. I say to them, "You can disagree with me, so tell me if you disagree with me. What do you disagree with me about? I'm not always right. What do you disagree about? Let's think about what the issue is and where we're trying to get."… Dissent to me is someone who either aggressively or passively aggressively does not conform to the innovations, in our case that the college of ed is trying to put forth, because they're just not going to do it for whatever personal reason. It's not necessarily that they think [the innovations] are bad. It's more like where they are in protecting their turf. That's situationally how I see dissent… someone who's not

> going to get on board and do something for whatever reason, whether they thought they're drawing a line in the sand, whether it's because they're going to have to do something else, whether their cheese is being moved, and trying to figure out if it is their cheese or if it's just going to be their stand or if it's going to be because they disagree. If you disagree, why do you disagree? What is it you disagree about?

This department chair implied that if people are able to discuss and work through disagreement and "think about what the issue is and where we're trying to get," it can be productive and helpful because "[she's] not always right." They are constructing program goals and practices collaboratively. This shows individual agency in the opportunity to disagree and to try to work through disagreements collaboratively. However, when people dissent in a way that is primarily about "protecting their turf" or "drawing a line in the sand," then she sees that as less productive. In other words, when faculty protect their agency for the sake of individual agency, and don't engage in conversations about the nature of their disagreements in ways that could move the program forward, that can stall (or even halt) individual and collective learning opportunities associated with those conversations.

The dean discussed a conversation she had with a faculty member that falls into the dissent category, in that they were not able to engage the issues in productive ways. She paraphrased the conversation:

> When you start converging a program, like one person said, it is hard work. [She said]: "You know, I used to feel like a faculty member. I had autonomy. I could make my own decisions. I feel like a factory worker now," and I said, "Could you tell me more about that, like in what ways do you feel like a factory worker?" "Well, I have more work to do." "What kind of work? What work is more work?" "Well, you know, in my courses

> I have to do edTPA. I didn't have to do that before, now I have to do this and I don't get to choose," and I said, "Well, let's talk about the students. What do you see?" "Oh, yeah, I mean, it's okay for them, but I feel like a factory worker." "Is there any way that you see that things might be different while still maintaining this sort of group decision-making process?" "It's just more work. I used to have much more time. I'm doing more work now."

The dean attempted bridging moves by bringing the conversation back to the object and potential individual and collective learning ("Let's talk about the students. What do you see?"). When the faculty member admitted that edTPA was "okay for [the students]" but still resisted the additional work, the dean continued to try to get her to weigh in on what "things might be different while still maintaining this sort of group decision-making process." This conversation attempted to align both individual and collective motives and agency; in other words, she tried to figure out if there was a way to work together on "group decision-making [processes]" while also addressing the faculty member's concerns about the additional work and the way it was making her "feel like a factory worker."

Another program administrator discussed how these conversations that involve people sharing their different perspectives and interests help the work move forward.

> It takes all kinds [of people]. I know that there's some frustration as we talk. We can sit around. We meet a lot and we talk. We have those conversations… It takes those two sides to really makes these processes work. They are rooted in what your own perspective is. You could just go into it and be totally frustrated, come out and say, "I'm not working with those people anymore. This doesn't make any sense. They don't listen." That's, I think, a really important piece with this group is we *do* listen. We are

thoughtful about the pieces we care about. The faculty who are doing the work. We care about the public school partners. All of us have had time on that public school side. Also here. We feel both sides of that. We've had to answer the phone when public school persons call and say, "This is not working." We've got to be able to make it work for them and make it work for the faculty.

There seemed to be a genuine attempt on the part of program leaders to make program changes and processes work for all stakeholders—faculty, supervisors, cooperating teachers and others in collaborating P-12 schools, and teacher candidates. As mentioned earlier in this chapter, listening was an important aspect of bridging practices ("That's, I think, a really a really important piece with this group is we *do* listen").

One of the outcomes of ECU's expansive learning process was an emerging sense of collective agency. This collective sense of agency was related to individual motives aligning with the collective object. It also had to do with the way that their expansive learning process—and the program changes that were adopted throughout the process—helped relieve tensions related to the primary contradiction between internal and external accountability.[19] In a time of intensifying external accountability policies, pressures, and mandates, ECU created new work practices that leveraged those pressures for internal uses. In an interview with two program members, they explained how "it's been a good road" because they are now "policy makers and not policy acceptors":

Faculty/Program Administrator: So, it's been good! It's been a good road and like we said a couple years ago, the train has pulled out of the station and we weren't lying.

Interviewer: (LAUGHS)

[19] See Chapter 6 for a discussion of the primary contradiction in expansive learning processes.

Program Administrator: Well, and that part of the argument was, we can be ahead of it and we can inform policy, or we could wait for the state to tell us what to do. We chose to be proactive about it…

Faculty/Program Administrator: We're policy makers and not policy acceptors.

Being "policy makers and not policy acceptors" allowed them a sense of collective agency in the midst of rising external pressures.

Bridging Individual and Collective Knowledge

As the previous two sections demonstrate, the collaborative structures and other program policies and practices that were instituted could not alone help program members achieve outcomes of program improvement. Bridging actions that helped align individual and collective motivation and agency were necessary to create buy-in and to continuously work to get more clear and concrete about the collective object and the best way to work together towards the object. These bridging actions took place through social interaction, including one-on-one interactions and group interactions. As program members began to collaborate more—sometimes willingly, sometimes in resistance—program members also worked to bridge individual and collective knowledge. As program members began collaborating in ways that crossed boundaries—for example, across subject areas, roles such as faculty and supervisors, or programs—they needed to probe different understandings of data sources, program outcome data, and the role of data in program improvement efforts.

A program administrator talked about the need to collaborate around "intentional initiatives and connections" to move collective work forward:

It doesn't matter who you're educating for or who you identify as a constituency group, without intentional initiatives and connections and conversations, you will miss the mark.

> It's like building a road from two different directions. You can't be lucky enough to meet in the middle without planning for it.

At ECU, the structures put in place to establish and support collaborative data use practices and other collaborative work processes were important in helping people make connections and have conversations that helped them "meet in the middle."

Ascending from abstract to concrete understandings. A faculty member and program administrator talked about her progression of aligning motives and then developing of a personal understanding of the work of edTPA and video grand rounds. She said in the process of trying to understand these program changes she "asked a lot of annoying questions… but finally I thought, 'Okay, that makes sense now.' But it only comes with time. It has to come with—you have to buy in and you have to put 100 percent of your focus with it." She talked about how she'd seen a similar process with other faculty:

> We've seen [this process] with faculty who were not involved with edTPA suddenly becoming involved with edTPA. Suddenly it means something to them. Then they're on board. They're talking the language. They're understanding the language. But until they actually have to do the edTPA, until they actually have to do the video ground rounds, it's real easy to just kind of let it float around out here because we have a lot of things going on. We're very busy.

She described a process wherein once faculty interests are aligned with a project and "it means something to them," they then need to spend some time and energy working on "understanding the language" and what it takes to, for example, implement edTPA in a concrete way.

Expansive learning is described as ascension from the abstract to the concrete (Engeström, 1981; Engeström & Sannino, 2010). This faculty member described a smaller-scale

individual process of learning that ascends from abstract (e.g., getting "on board" with collective goals) to the concrete (e.g., "understanding the language" and being able to implement change such as a new tool). These individual processes must take place within larger object-oriented expansive learning processes in order for individuals—the "subjects" in an activity system—to develop new work practices aimed at an expanding co-constructed object and related desired outcomes.

Developing common knowledge. In a conversation directly following our observation of a co-teaching data retreat with all retreat participants, several faculty members and program administrators spoke about how the retreat had gone in some unexpected, but useful, directions:

> Female: There was stuff that we didn't think we were going to talk about [in the retreat today]. It's this third space conversation basically—the idea of thinking we're going to talk about co-teaching and getting into the dispositions forms. That was a really vital piece of our conversation today.
>
> Interviewer: Mmhmm (affirmative).
>
> Female: Yeah.
>
> Female: That has informed maybe where we need to go with that, yeah, yeah.
>
> Female: Yeah.
>
> Female: Yeah.
>
> Female: That's why no matter what the data says about VGR, edTPA, co-teaching, instructional coaches—I don't care what the data says; it brings us together and we're getting better.
>
> Female: Yes.

Female: … We're getting better because we're talking to each other… This is not happening any place else. I talk to my colleagues all across the state and the ones who are finally starting to do the edTPA in early childhood, they're finally starting to talk to secondary folks. Nothing else has made that happen.

Female: That's what I see. My comment yesterday about not letting us lose local scoring.

Female: Yes, right.

Female: That's our dean's thing, too, that it's professional development for faculty around our programs.

Interviewer: Yes.

Female: That's right, that's right.

Female: It's harder to throw barbs across the room at one another if I have an understanding of your work and an appreciation of some similar challenges and all of that.

Female: Yeah, yeah.

Female: Yeah…

Female: Even just providing time to talk with your colleagues [is important]. We get so wrapped up in our own little piece… but when you do [talk with your colleagues] it's like, that was worthwhile.

These program members argued that data "brings them together" and allows them to develop "an understanding of [other program members'] work and an appreciation of some similar challenges." They began to understand aspects of the program beyond their "own little piece."

As program members engaged in collaborative practices, they highlighted what mattered to them as they interpreted and responded to joint work (Edwards, 2010, 2011, 2012). The

excerpt above shows how joint work can facilitate the development of *common knowledge*, which is a resource for mobilizing knowledge across practice boundaries (Carlile, 2004; Edwards, 2010, 2012). Common knowledge is generated at intersecting practices in talk about potentially shared objects of activity where purposes and intentions are made explicit (Edwards, 2010, 2012).

In a focus group, another faculty member spoke about how edTPA was helpful in facilitating collaboration that entailed "[coming] to some agreement":

> What I like about [edTPA] is that it allows faculty to have conversations about what we're actually—data isn't any good unless you know what that tool is telling you, right? If you've got a tool like that, we all have to be on the same page, so our expectations have to be the same. Suddenly you are working with each other and my colleague in [another ECU program] isn't looking at the things in maybe the same way as I am so we have to come to some agreement about how we're going to look at whatever this is… Then you get to drill down a little further—and we all come with our own biases and our own perspectives… Then we can really start to look at how we're interacting and helping to create this data[20] that then we can turn around and use. Because if we don't do that first, if we don't calibrate [our edTPA local scoring], then the data doesn't really inform us about what we need to do in the classroom. From my perspective that's been the most helpful thing: that I feel like I understand how data is being processed, how we're coming up with this, and what we need to do to make that stronger so that then we can go back and look at these other pieces.

[20] She was referring to the process of edTPA local scoring, and more specifically calibration exercises related to scoring, when she said they would "create this data." In other words, when the data is scored internally they "create" the scores.

EdTPA acted as a tool around which program members could start to understand each others' "biases and… perspectives" in the process of getting "on the same page" in terms of their understanding of the program and program outcomes. As also discussed in Chapters 5 and 6, internal scoring of edTPA (or other performance assessments) presented useful learning opportunities for individuals, and also facilitated shared understandings about not only the assessment itself, but also the goals of the program and how stakeholders might reform program practices to try to achieve those goals.

A few program members talked about the role of "group norming" and "group norming sessions" in coming to a common understanding of goals and practices for the "projects that are tackling an aspect of the program and trying to look at how we might do it more effectively" (Dean). A faculty member spoke about how "group norming" facilitated the development of common knowledge:

> A couple of faculty members are very good colleagues with one another, but they would really think differently. By the end of some of those [group norming] exercises that we would do with them, people were looking at the TPAs as a lot more than that, because what we're trying to do is get that transformative change taking place… So it's not doing "here's another mandate," it's "let's norm on the edTPA". As we're norming things, we're actually norming a program area and norming program thought.

Norming on the edTPA wasn't as simple as calibrating scoring. Many program members we spoke to talked about how "norming activities" such as calibrating edTPA scoring would inevitably lead to larger conversations in which program members were "actually norming a program area and norming program thought." In other words, these conversations helped

participants develop a better understanding of their programs, their colleagues' practices, their collective goals, and areas and methods for program growth.

The role of leadership practices in building common knowledge. Leadership practices aimed at bridging individual and collective knowledge were visible during a data summit at the fourth site visit. The director of assessment and accreditation, who facilitated the meeting, explained that a key aspect of her strategy was having program members generate their "priority questions"—what they'd like to use the data to find out—specifically related to program improvement goals. At beginning of the data summit, they reviewed the priority questions from the previous year's data summit. The facilitator was interested in "How did we do on those five priority questions? Which one was the top one for you individually? Which one was the top one for your program?" and used clicker technology to record their responses. The facilitator returned many times in the summit to the goals of using data for program improvement, improving individual and collective practice, and making their teacher candidates better novice teachers and therefore helping kids learn and grow. After establishing those goals, she talked about "trying to build a 'chain of evidence'" using three different sources of program data. She also introduced some data-related norms: a shared commitment to action, intentional collaboration, and a focus on evidence.

Later the facilitator had participants generate three new priority questions for each of the three focal sources of program outcome data in small, mixed-program groups that included faculty from the College of Education (COE) and from other departments across the university with teacher preparation responsibilities. These conversations provided opportunities for faculty to build common knowledge. For example, an arts and sciences faculty member in one group asked "What does the ISLES score mean?" and a COE faculty member explained ISLES, and

how it related to the edTPA data on the table. There was an ensuing group conversation about the link between ISLES 3 and the edTPA. At this meeting, data were often used to open up new conversations rather than resolve them. Much of what surfaced at this data summit was related to the need to strengthen the connections between elements of the program, including those between COE faculty and faculty from other departments. These conversations acted to build focus and consensus about directions to move forward with data analysis, implementation, and future collaborative efforts.

Developing a common language of practice. Program members also spoke about the emergence of a common language of practice when these cross-role and other boundary-crossing conversations occurred. This common language was viewed by many faculty as pivotal to the emergence of new levels of collaboration: "I think, as a department, that it has become so much more streamlined and we're using similar language between the courses. We're having conversations between the courses" (Faculty). This similar language allowed them to have conversations across boundaries, including cross-course, cross-role, and cross-program conversations.

Another faculty members spoke about how the process of analyzing some program data and writing it up in an article went very smoothly when the collaborators had a "shared language… that makes a huge difference because you knew what I meant and I knew what you meant." The significant value of a common language of practice as a tool for building faculty capacity for collaboration and for making college programs more coherent was not necessarily visible, or even imagined, by many faculty early in the process. College leaders had to push on faculty and staff to undergo the process of learning that language through various collaborative

structures such as data retreats, research communities of practice, and edTPA scoring training, calibration, and execution.

Bridging Individual and Collective Expertise

Creating distributed leadership. One important aspect of ECU's process of expansive learning was bringing other people on board who could help execute the dean's vision and the activities that help meet that vision. The dean expanded the team of people involved in evidence development, and therefore expanded the leadership, expertise, and viewpoints involved in the process. She first expanded the leadership team related to data use by "[getting] the right person on the train, which was [the Director of Assessment and Accreditation] because she understands this notion of evidence development" (Dean).

The dean further expanded the team of academic leaders invested in and executing work related to data use by strategically putting people in positions to help support data-informed program improvement practices and providing the resources to help these new leaders succeed. This process also addressed an important sustainability concern, since the dean couldn't sustain the work alone: "At the end of year one [of the TQP grant]… I was trying to dean and trying to get it up and running and there was nobody who could lead it. Now, I have people who can lead it. Now I have people who could step in." The dean created several new leadership positions, some of which were administrator positions housed within the Office of Assessment and Accreditation and some of which were faculty members who took on additional administrator roles.

Developing relational expertise. Edwards's (2010) conception of relational expertise involves "knowing how to know who" to involve to move the work forward, and recognizing and aligning individual motives so that joint engagement continues, guided by the overarching

object (in this case, data-informed program improvement). At ECU, an important aspect of the new director of assessment and accountability position involved "getting teams together across departments" (Dean). In order to encourage more faculty to get involved in data use, and thus expand the expertise and viewpoints brought to various aspects of data use work, the dean and other program leaders consciously fostered cross-role collaboration through both formal and informal collaborative structures (discussed in Chapter 5 and Appendix D). These were important structural supports through which program members could be positioned as experts who could inform each other's individual and collective practices.

The dean and other program leaders also identified program members' strengths and leveraged them in ways that were helpful for both individuals and the collective program improvement agenda. Program members spoke about multiple leaders identifying and then utilizing individuals' expertise by building roles for them where they could contribute to collective work in ways that were valued by program leadership, the institution, and their colleagues:

> We're recognizing their strengths and we look at what you bring to this, and let me find this role for you to do here. But then you still have that level of trying to bridge the gap if they don't really know some of the innovations because they haven't done them, and trying to help at that point. But we do have conversations more and more and more now. People are talking.

This excerpt suggests an important relationship between bridging knowledge and bridging expertise practices. The common knowledge built through collaboration and support from program leaders was an important resource to allow individuals to bring their expertise into collaborative spaces.

Strategically utilizing individual expertise for a collective agenda. In her first interview, the dean identified the need for particular individual expertise around research design and methodology in order to move her vision forward:

> What I'm finding is that I think our faculty are very receptive [to the data use-related initiatives]. There's a core of faculty that are really moving and the issue is, we don't have enough people here that can help with research design because really, the difference in the work that we've done so far and the work that we want to do is we now want to design planned implementation strategies, and then we want to study those, both process and outcome, and to do that, you have to plan at the front end: what kind of baseline data are you going to collect, who are the students that are going to be involved, how are you going to do a pilot, who are you going get for that, who's going to do the IRB? It is massive in terms of investment, and the faculty that has been hired here really don't have those skills or experience, in large part… So my dilemma is, how do I get people in here who can help with that part of the process? (Dean)

Once she identified the need for more research expertise, she brought in both some researchers from the department of biostatistics as well as COE faculty with expertise in research methodologies to work as methodologists and support research aligned with various program innovations and related program improvement efforts. Several faculty members and program leaders discussed the considerable contributions of one COE professor, Louis Caruso,[21] who previously wasn't involved with college-level work:

> Faculty 1: Louis Caruso, three years ago, he was—you wouldn't be able to find him.
>
> Faculty 2: And I love Louis. The dean brought him in [on these projects].

[21] All names are pseudonyms.

Faculty 1: That goes back to the workload analyses. The courses that he was teaching, he's in this research area and they didn't have enough students, his boxes wouldn't [add up]. So what else are you going to do? He's not the only one like that. We had this conversation about what are other ways that you can contribute to the college, because you're still drawing a full salary, but you're not…

Faculty 3: So he and some other folks in the research area have been brought in to work as—some of them worked as methodologists on dissertations and in leadership or higher ed departments, and they've been giving support to the actual research projects at the masters level and with some programs as well… and some of this type of work.

Interviewer: So it's interesting, my take from Louis is that he's enjoying it.

Faculty 3: Oh yeah.

Faculty 1: Enjoying it… And he was marginalized because his philosophy is direct instruction, and because of direct instruction he's been marginalized for the last 15 years. Whereas now, he can bring some things to the table that we need to take a look at and he really has opened up— If you want to know what TPA has done… Louis Caruso is a full professor who really brought his talent…

Faculty 3: I see him digging into the methodology piece of it. I've heard, [another faculty member] will joke with me and I'll say "well Louis tells me he can make a methodologist out of me, what do you think?" He's like talking with her and he wants to buy these books about whatever methodology. So before I know it, we're buying two—one so they can talk about it, one for [another faculty member] so that she can keep up with it… We lose that a little bit in personnel reviews and things like that. (Focus Group; Faculty and Program Administrators)

This faculty member was given a new role supporting research projects that "contribute to the college." This had the effect not only of contributing to the collective expertise of the college and college-level research, but also of bringing this individual out of being "marginalized for the last 15 years." By contributing to this new, emergent agenda, he was able to do work that was valued not only institutionally (e.g., before he was having trouble filling his "boxes" because of low enrollment, and now his work fulfills college requirements) but also interpersonally (e.g., "I love Louis"). In addition, his contribution to the team had the effect of raising the expertise of other members of the group, too. For example, he was coaching other faculty members about various research methodologies.

In another focus group, two different faculty members commented on Louis's contributions in the context of a conversation where they were arguing that the dean was supporting faculty engagement in research through financial incentives and course buy-outs:

> Faculty 1: [The dean] is very strategically investing in things in the college that are leading to a larger college research agenda.
>
> Faculty 2: Yes, and pulling in multiple faculty that are part of the excitement and feel it and want to work with it to build it into that bigger connection.
>
> Faculty 3: … I think Louis Caruso is an excellent example. He is completely re-engaged in this college. He's an excellent researcher, he's very good one-on-one with people, he's an excellent writer… He helped write our Pirate Code. I think the dean is very good at seeing people's skill sets. He is an excellent writer and researcher, so she said okay, we need your help. He's in the game.

The dean—and other program leaders—"were very good at seeing people's skill sets" and working to get different program members engaged in the program research and development

initiatives in ways that added additional expertise to the team. The methods used to motivate people to engage once program leaders identified them as offering an important perspective on the work included bridging actions described earlier in this chapter aimed at aligning individual motives with collective motives.

Developing human resources for individual and collective development. This is also an example of how distributed expertise acted as a resource for both individual and collective development. A faculty and program manager spoke in an interview about the importance of *human* resources in supporting the work:

> You can talk all you want. If you don't provide resources to people—and not resources reassigned. Not: I'm going to buy you out with something and we own you. It's more like, "You have an idea. How can we support that idea? Okay, you're not strong in methodology. How can we bring somebody in to help you develop that methodology so you can research that practice?"… We have a lot of faculty members who are learning how to do research again, which is pretty exciting.

While organizational resource shifts such as increased course buy-outs for data-related work were important incentives and supports, the increased network of expertise and the opportunity to collaborate with colleagues with other areas of expertise were valued by many program members and served to motivate engagement in data use practices.

The process of exercising relational expertise in order to increase distributed and collective expertise started with the dean expanding the role of the Office of Assessment and Accountability and creating new leadership positions. Soon afterwards the dean began developing research communities of practice and several other collaborative structures because "we need to begin learning from one another" (Dean). The dean and other program leaders also

invested in organizational and human resource-related incentives for faculty and supervisors to get involved in the research and development work, and thus expand the expertise involved in various data-related projects.

Increasing the network of distributed expertise. As the expansive learning process continued during the course of our data collection, the network of distributed expertise at ECU increased in size and scope. TEP members began talking about starting to work with other departments who had "similar interests and kinds of questions" around data-informed program improvement:

> In our college, the culture is the research is on our practice. We constantly improve our practice… Then we're building that model out for other departments… To take that concept of that collaborative practice in research and link us with other people with similar interests and kinds of questions… That sort of notion that people can bring different pieces—They said this is a great idea, and the dental school needs this. The medical school needs this. They want to research teaching practices. *We're* researching teaching practices! How can we connect and benefit from their resources, at the same time contributing and learning more we can bring back here? Some of their technology training—We've got another team in the college that's been really struggling for a couple of years to articulate how they want to approach researching the most effective ways for our online programs—for instruction… building collaborative learning communities in that kind of environment. The medical school and the nursing school are doing some of that, but don't know how to research it. To link those teams up would inform both research and praxis. (Program Administrator)

This openness to broadening participation in data use work to contribute to and learn from others' work extended to the TEP partners in P-12 schools. Multiple program members spoke about the importance of increasing collaboration and communication with supervisors and clinical teachers. They made several important moves to include these other stakeholders in their data-related work, including creating collaborative structures and data retreats specifically for supervisors and clinical teachers. A supervisor in a focus group spoke about how she felt *listened to* by people from the university, both as a supervisor and former principal:

> It goes back to that partnership, that willingness to collaborate. I think as a university they're all aware that we need ground-level people to guide us because we're on the theory side. They're applying everything. If what we're teaching candidates is not working out on the application side, then we're not doing our job, and we're not going to be preparing them to do their job, so they listen to clinical teachers. They listen to principals. Having been a principal, just having retired three years ago as a principal, they would call principals and say, "Are we producing good students for your schools?" They would ask. They want to know, "Are our students producing in your schools?" Of course, as good principals do, we let them know what kind of products are coming into the school. So they listen to the clinical teacher, they listen to the principals, they listen to university supervisors. They listen to the personnel directors, because they're the ones who are really seeing all of the [new teachers] coming in, and they are the ones who are hearing feedback from the principals, so there's that partnership with the human resources directors and associate superintendents. They want to know, "What we are we sending you all, is this a good product? Are you all having to retrain them once they come out into the field, after we have worked with them for four years?"… I would say,

> "They're coming out to be better products." As everything expands and there are more programs and more collaboration, ECU is turning out better teachers.

The university-based program members valued the expertise of the various stakeholders in the P-12 schools, one of the key neighboring activity systems. The above statement implies that university-based program members were having bridging conversations with stakeholders in the field to see whether there was alignment between them regarding their interests and motives, including their hopes for new teachers. These conversations also included those stakeholders in the community in a way that explicitly values their expertise.

Their network of collective expertise expanded both inside and outside the institution. As a program administrator said:

> We're connecting people in different program areas to other people in the other institutions. This is the first time in 15 years that I've been in North Carolina, 16 now, that we're doing cross-institutional discussions and research. It kind of happened with people in the middle school, but now we're doing it through TPAs and other—it's pretty cool. I think that's a big thing: that people are seeing that they're not the only ones, so I think there's a momentum that way. They don't feel alone, in particular in a lot of small programs.

As people began connecting with others from different program areas and institutions, they learned about common challenges and new strategies for the work. As another program administrator put it, "there's no reason why everybody has to recreate the wheel."

Conference attendance, presentations, and collaborations such as organized symposia were other ways that ECU program members began networking and collaborating with people from other institutions around evidence use both generally and related to specific projects, such

as edTPA. Several program members also visited programs in other states to learn about their program innovations and data use practices. For example, their use of video grand rounds grew out of a visit to another program that was implementing that innovation. A faculty member brought the idea back to ECU and to the dean, who agreed that it was in line with their goals around evidence use and supported a pilot. Video grand rounds eventually was implemented on a larger scale, and is a part of their Pirate Code conceptual framework.[22]

Increasing individual and program visibility. Increased distributed expertise at a broader scale had the effect of increasing the visibility of both individual program members and also of programs and departments outside of the COE. In a focus group, several faculty members commented on the role of edTPA in increasing individual and programmatic value and recognition:

> Faculty 1: I think it helps that we know each other [faculty in other TEPs across departments] now… Now we know who to talk to. If we didn't know before, we start to pick that up in those edTPA meetings… We have common language now.
>
> Faculty 2: It's helpful. In our department, it's a very large department but we have two teacher ed. programs. Now we're on the forefront more. People are aware of who we are because we're doing edTPA and that's new. We're going to national meetings about it. We're doing research related to it. It's a big deal. That brings awareness to all the faculty… we're valued more… in our department…. It's the visibility and the awareness and the understanding.

[22] See Appendix E for an implementation timeline for video grand rounds and other Pirate Code program innovations.

> Faculty 3: For us, being part of ECU's edTPA initiative, which is nationally recognized, that sort of brings us onto the national level, not just the state. That means a lot to our chair and our dean.
>
> Faculty 2: And our dean… The more credibility and the more connection a program like family consumer science has with education in general, it strengthens it. That's one thing I love about ECU and our Council for Teacher Education that really provides that structure for all of us in the different colleges to feel just as valued in our education programs and supported by what's offered. EdTPA's done that for us in a big way.

Both access to a common language (discussed in the previous section) and cross-department collaboration empowered program members who were historically on the margins of program conversations and collective decision making. One faculty member described a shift in participation by field supervisors as they became members of this evolving language community:

> I've never seen anything quite like that happen—where people who really had not had a chance [to talk]… they were like ships in the night and all of a sudden there is this community of practice and they are all talking to each other.

Several faculty members commented on the importance of this emerging sense of collective commitment, collaboration, and expertise in motivating and sustaining their engagement with the challenges of developing new ways of doing their work.

Bridging Individual and Collective Responsibility

Developing shared responsibility for program outcomes. As program members became more invested in collective motives, agency, knowledge, and expertise, the data indicated a growing sense of *shared responsibility* for program outcomes. A program

administrator articulated her conception of one of the important outcomes of the collective development of the program:

> To me, [the desired outcome] is ownership beyond your course. It's an ownership for the program and the product in the program… You have to look beyond your piece of the pie to what's coming out at the end. If we have an issue, we have a responsibility to get this to be better at the end.

The idea of "ownership beyond your course" is connected both to program members' growing "responsibility to get this to be better at the end" (i.e., improve overall program outcomes related to candidate learning, development, and performance) and to the growing conceptual coherence within the program. This growing conceptual coherence was supported by the increase in common knowledge—faculty and supervisors knew much more about each others' "[pieces] of the pie" than ever before—as well as the holistic nature of new assessments that evaluated candidates' performance in ways that transcended individual course or fieldwork experiences.[23]

Data sources, such as edTPA, that reflected candidates' performance across program curricula (as opposed to within a particular course or field experience) facilitated a broadening of program members' sense of ownership of the data and responsibility for the outcomes. A program administrator in the Office of Assessment and Accountability noted how she saw a shift occurring related to faculty "ownership of the data":

> We're shifting. We've gone from running the [data] reports and people saying: "That's not right. Somebody needs to fix it," to: "It's not right. How do *we* fix this?" They see the data is more valuable to them, so there's more ownership of the data and more reason

[23] For more discussion of how standardized teacher performance assessments evaluate candidate performance across program curricula—and why that's useful for program improvement efforts—see Peck, Singer-Gabella, Sloan, and Lin (2014).

for them to take care of it and kind of tend the garden a little bit, instead of just saying, "that's somebody else's responsibility."

Faculty members also spoke of shared responsibility of program outcomes and the data that reflected those outcomes. For example, in a faculty focus group at our third site visit, multiple faculty members spoke about their reactions when they got their candidates' external edTPA scores back from Pearson. Faculty spoke about how both externally and locally scored edTPA data were a "reality check" and when the data were brought to the attention of many faculty, "they were feeling uncomfortable with it." Faculty also stated that "there's a joint ownership" in terms of taking responsibility for improving the curriculum to support candidates taking edTPA. Another faculty member in an interview at the fourth site visit talked about how faculty took joint responsibility in addressing the issues that various data sources identified with the curriculum or program outcomes:

> We could never make those changes until we had the data. Now, all of a sudden, it's not just, "I'm doing this in my class because I feel it's the right thing." Everybody needs to be doing something like this because it's what we as a program needs to be doing.

This excerpt also demonstrates how the shift towards shared, collective responsibility—including faculty members' willingness to design courses or field experiences in ways that meet collective program needs and goals—correlates with the shift to foregrounding collective agency over individual agency discussed earlier in this chapter.

Connections between distributed expertise and shared responsibility. There was also a connection between the growing sense of shared responsibility and the expansion of distributed expertise in the program. As a faculty member who was also the edTPA coordinator said: "We're in this together. Everyone brings something to the table." There was a sense of shared

responsibility for both the process (e.g., course and fieldwork, as well as the research and development process) and program outcomes (e.g., edTPA scores, principals' evaluations of new student performance, internal views of teacher quality).

Cross-departmental collaboration and resource sharing also facilitated this sense of shared responsibility. A faculty member from outside the COE argued:

> It would've been so easy for elementary to just fly with this [program innovation] and just go light-years ahead of the rest of us. But they took very careful and intentional steps of bringing other people along. For me that's actual collaboration. Sharing resources that our college didn't have and sharing all the steps that they've learned along the way with K-12 programs like mine. To me that's incredible.
>
> It's the people that drive it, the resources that support it. It's that willingness to collaborate, because they could've kept trucking with their research and just forgotten about us easily, but they brought us along and that was really important because that's made huge, huge changes.

While organizational resources supported engagement in data use work and helped facilitate collaboration—for example by making time and space for the work, and also supporting it financially, even in programs outside the COE—this faculty member argued that the people drove the work through "very careful and intentional steps of bringing other people along." These steps included the bridging practices described in this chapter, which aim to "bring people along" in the sense of broadening engagement in practices aimed at program improvement.

Connections between collective agency and shared responsibility. Study data indicated an important connection between an increasingly collective sense of agency and shared responsibility for program outcomes. This was illuminated in an interview with three faculty

members and program administrators. In the context of discussing external accountability pressures and the "tsunami of expectations" associated with them, these program members considered what allowed them to "stand up to that wave while the water is rushing at you":

> Faculty 1: One person in that wave, you're going to knocked over in a heartbeat. I think when you're all in it together and you're like, "Yeah, this is tough. Yeah, we just did all this, and we're probably not going to get recognized for it, but you know what, we're motivating ourselves to keep going." There's recognition to give each other and acknowledgement and confirmation of that. I think it happens on individual levels, small levels, and formal levels. I see it—like our chair recognizes people in meetings and things like that. I see the dean throwing little positive things your way…
>
> Faculty 2: I think you're right. I think that's an interesting visual because I could see a clump of people grouped together, and then I see the dissenters on the outside. What happens is we're a little more comfortable in that wave and they're getting just knocked around and it makes it that much harder for them."

The idea that "it's more comfortable in that wave" when you are working collaboratively with colleagues towards shared goals implies one way that individuals might be motivated to participate in collaborative endeavors. Later, one of the faculty members said: "I want to be part of [the wave]. I don't want to be battered around by myself." The shared responsibility comes with the benefits of collective agency; there is strength in that collective power. On the other hand, those that don't agree with the organizational changes happening may feel that "they're just getting knocked around." What's potentially empowering for members engaging in collective, collaborative work may feel disempowering to program members whose individual motives and beliefs do not align with the emergent collective motives and beliefs.

Bridging practices aim to move more program members from outside the wave, where they're "getting knocked around," to the strength and protection of the collective, which can stand up to the wave. These practices work to align motives and convince members of the importance and benefits of developing collective agency, knowledge, expertise, and responsibility.

Connections between common knowledge and shared responsibility. Another important function of the collaborations and bridging practices was the development of a relationship between the collective knowledge described earlier in this chapter and the joint responsibility that is the focus of this section. As program members increased common knowledge abut each others' work and motives, they began to identify and co-construct a more concrete understanding of the object of their collective data use practices, and also of the larger object around training excellent beginning teachers.

Both the tools (i.e., various program assessments and data sources) and the work practices that were built to utilize those tools helped foster a sense of conceptual coherence throughout the program as individual practices and goals became increasingly aligned with co-constructed program practices and goals. In a faculty focus group, a faculty member spoke about the important role that edTPA, as a "standardized measure to really say 'Here's what happens at the end'" (i.e., here are our candidate outcomes), played in helping program members develop a shared and concrete sense of purpose:

> Faculty 1: What we started saying is at the end of our program, we want our students to be here. We knew where the end zone was. I think for a long time, different people had a different end zone… What [edTPA] did was it lead all of us to have the same goal: "Okay. This is what we want in our intern. Here's how we get there." Then once we all

knew what the end zone was, we had to collectively look back and say, "How did we get there?" and look at our program and say, "If there were deficiencies, why were there deficiencies and what did that mean for us?"

This has not been an easy process for us. This has been a very stressful, to some people personal sometimes, process. It's because it used to be possible for me to go in my classroom and shut the door just like it is for public school teachers. It used to be possible for them to go in a classroom and shut the door and do what they felt was best for kids. If I don't have the same end zone as everybody else, we're not working together to get everybody to the same place. I could be doing what I thought was right. If it didn't sync with the professor down the hall, it didn't make any difference, really. It has made us all realize, "Okay. We're on the same field. You have to play your position. I have to play my position. We have to have a quarterback who calls the shots sometimes." Sometimes people don't like that, especially in higher ed. Sometimes, people have said, "Well, my academic freedom, you have to protect my academic freedom." But we had a real heart-to-heart with the dean the other day about what did that academic freedom mean. That it really belongs in the realm of research, not so much in the realm of teaching. That was a revelation for me. It was good…

It used to be that we didn't have to have those conversations because I was playing football and you were playing baseball. We weren't even on the same field. It has, in our faculty, been a very difficult time. Sometimes people don't like those innovations because they perceive that it's not contributing the way that they would want for things to contribute. People have the right— everybody has the students' interests at heart. I think sometimes, now, we're seeing what we do in the institution, what we do at the university

has got to translate to the outside world. What we value has got to translate into the outside classrooms. Then that accountability that teachers are facing is really not different from what we're facing.

Faculty 2: That's right. We're held accountable.

Developing new forms of interpersonal and organizational accountability. The first faculty member quoted above described a process of becoming a team that was playing the same sport together, and also was developing "the same end zone" and collectively constructed ideas about strategies to better reach that shared conception of the end zone. He described how this process was both difficult, and also was driven by the fact that "everybody has the students' interests at heart." He also described an important relationship between external accountability, which drove some of this process because "what we value has got to translate into the outside classrooms," and internal accountability, which was driven by their collective search for the same end zone and the creation of practices that best serve that object.

Faculty in the interview in which the wave metaphor was discussed described a sense of "shared accountability" both to each other and to their mutually developed and agreed upon aims related to data-informed program improvement. They agreed that the changes "clearly [haven't] been easy for any of us," but that "shared accountability" was a major motivating factor in their engagement in the change process and the related emergent data use practices. One faculty member, speaking about external accountability pressures in education, said:

Sometimes we're not quite sure who or what we're accountable to. What always seems to rise to bubble up to the top is: we're accountable first to our students. Then when you do a project like this we're accountable to each other, but somehow here's that good sense of we're accountable to the profession. But it's a good feeling of being

> accountable. It's not as if somebody's telling us you have to do it. It's: we opted. We identified what was important and went with that.

When they "opted", their relationship to the work changed; when they were working for themselves it was more meaningful and energizing.

The development of collectively constructed motives, agency, and knowledge; distributed expertise; and shared responsibility helped program members manage the tensions between external and internal accountability (see my discussion of the *primary contradiction* in Chapter 6). Instead of being overwhelmed by the "tsunami of expectations," they co-constructed "a good feeling of being accountable" that involved "being accountable to each other," being "accountable first to [their] students," and being "accountable to the profession."

Changes to organizational structures, policies, and practices were important in facilitating broadened engagement in collective data use practices, but were not sufficient. A program administrator articulated the importance of "the human factor" in developing collaborative, object-oriented data use work:

> So many times when you get into big institutions and teacher education at large, it becomes so anonymous and impersonal. Sometimes I think we forget how important the human factor is. It's the relationships, whether it's us being responsible or accountable to each other on a small level, or to our students which gets to a bigger level, or to the college which is bigger. It feels like sometimes the institution is so big, the institution of teacher education is so big, that it loses the common human connection. That in the end seems to be what really drives us to do our best work.

The bridging practices reinforce the "common human connection" and encourage program members' "best work" by supporting individuals' connection to collective motives, a sense of

collective agency, increased common knowledge, a network of distributed expertise, and a sense of shared responsibility and accountability to each other, their students, their institution, and the profession.

Connections Across All Three Cases

I focused on the case of ECU in the above explanations of the bridging practices that support object-oriented expansive learning efforts, but the findings related to the specific bridging practices emerged from analysis of data from all three cases. The difference was that the data from UCSB and Alverno College primarily described the outcomes of these bridging practices. The bridging practices appeared to be so well established at these sites that the practices and the processes themselves were less visible than they were at ECU.

ECU was in an earlier stage of expansive learning around the object of data-informed program improvement. This meant that many of the challenges of this work—including fostering and maintaining motivation for engagement in collaborative data use, dealing with tensions between individual autonomy and the desire for a more collective sense of agency and responsibility, and the need to create common knowledge and distribute expertise in ways that support the work—were more visible, more pervasive, and more urgent at ECU than at the other two sites, which had a longer history of structural and cultural change related to collaborative, inquiry-oriented data use. However, the outcomes of these bridging practices—increasingly collective conceptions of motivation, agency, knowledge, expertise, and responsibility—were very visible, and there were clear connections from those outcomes to the bridging practices that helped create them. In this section I'll describe those outcomes, and their relationship with bridging practices, as they were visible at UCSB and Alverno College.

Fostering co-constructed collective motives. The strong cultures of inquiry seen at UCSB and Alverno (see Chapter 5 for more history and context related to these program cultures) grew out of their history using various sources of data in the context of collaborative data use practices. Program administrators, faculty, and supervisors all approached data use activities with a "What can we learn from this?" lens (Faculty, UCSB). Program members shared a strong, cohesive vision of program goals; their data use activities and the program changes that resulted from that work were all oriented around making sure they were graduating the strongest teacher candidates possible. The data suggest that program members used data both to try to improve both individual practice (e.g., individual instructional or supervisory practice), and also collective goals (e.g., make sure that candidates' experience through the whole program sequence helps them learn to be the best possible teachers).

A faculty member and program coordinator at UCSB talked about when program members queried the data to try to learn how to improve individual and collective practices, they did so with a "flexibility of purpose" that allowed them not just to solve existing problems of practice, but also to question their assumptions about those problems and potentially reformulate the original problem. In this way the program's data use processes involved "genuine inquiry": "I would frame it as genuine inquiry… We're trying to figure things out. What drives [the work] is the pursuit of solutions to real problems of teacher preparation" (Faculty/Program Coordinator). The culture of inquiry they developed also meant that even a conversation focused on one candidate's data could spark a broader-level conversation about "what counts as good teaching" and the "end goal" for their program:

> One of the things that for me animates all the work, keeps it moving, is the flexibility and purpose that is true of most of these conversations… It's always possible that a

> conversation is going to break into a questioning of our purposes, like what are we doing here in teacher ed? It's always possible that the conversation is: what counts as good teaching?… That's a big deal… I'm always excited about that conversation… it keeps it moving. The flexibility of the purposes of these conversations means that they're alive. The end goal isn't inert. Animate may be the right term, so that it keeps it alive. In the process of trying to figure out whether or not this one student is minimally competent, we might wind up having to talk about what we think it means to be a teacher educator. That's pretty cool. That keeps it alive. (Faculty/Program Coordinator)

In this sense, they continuously co-constructed the object(s) of their work, just as they did in the other two programs. The object(s) of their work, and the means of achieving related outcomes, were always open for discussion.

Fostering collective agency through productive handling of disagreement. When program members spoke about the role of disagreement and how it was handled within these programs, they alluded to program cultures in which leaders and other members worked to bridge individual and collective motives, goals, and agency. For example, at UCSB the faculty member and program coordinator quoted above said:

> There's this kind of ethos. You're allowed to want something different… Then secondly… we want good things for kids. You might have a different idea about it that than I do. I'm not going to make you agree with me. You can't make me agree with you, but if we care enough about kids then we certainly should talk about it.

Similarly, a supervisor at UCSB stated in a focus group:

> Under [the TEP Director's] leadership, her primary purpose has been the growth of this program and the collaboration of all the members in this program. I always have felt like

> a member of the family. We don't always agree, but we do bounce ideas off of each other, and our primary purpose is how can we do a better job with our candidates. We have our course instructors, we have the leadership, we have our site supervisors all working together with a common goal.

Over time, *all* program members—notably including supervisors, who are traditionally often at the periphery of TEPs—found ways to work collaboratively "together with a common goal."

A faculty member at Alverno also spoke about the importance of grounding disagreements in their relationship to potential common goals:

> I think part of what it comes back to with a disagreement is that there's a lot of respect between the faculty here… We know that we come from different places. We know that we have different ideas, and when these disagreements come up, it's not an "I win" or "you win." It's a "let's see what we have in common. Let's see what I can make out of your argument. Let's see what you can make out of my argument. Do we have anything in common? Is there some way that what you're thinking illuminates what I'm thinking or what I'm thinking illuminates what you're thinking?" We're always looking for those. It's not an "I'm right, I'm going to win."

This excerpt also makes visible the type of bridging practices that attempt to articulate and align connections between individuals and the collective agenda. They work to "see what we have in common" and develop common knowledge of each others' motives, expertise, and goals and use those understandings to move the collective work forward.

The role of trust, respect, and listening in collaborative work. At all three programs there was a lot of talk about the importance of trust, respect, and listening to collaborative data use work. For example, a program administrator at Alverno said:

> Faculty need to listen to each other. Here there's this orientation toward openness, discernment, identification of patterns. It's when your ears are really open, that sense of what becomes data is broader… The process of gathering data… has got to start with that disposition of *listen*.

The process of listening—both between faculty and among faculty and program leaders—appeared to be important in building the trust that also facilitated inquiry-oriented data use. At our first site visit to UCSB, we observed a program-wide data retreat in which some supervisors shared video data related to their candidate supervision in the field in order to discuss the purposes and processes of using video data for candidate and program learning. Speaking in a focus group directly after a data retreat, a supervisor discussed the role of trust in this type of collaboration:

> People were willing to share the data [in the data retreat]… There's a level of trust, and that doesn't come from nowhere. That's based on the fact that we've done this a lot for a long time and there aren't really right answers. We aren't looking for right answers, but maybe more questions, but coming out of our actual work. Not just talking about it, but looking at what is really happening.

Their collaborations, and the culture of inquiry they helped foster, led over time to a "level of trust" that allowed program members to share their work in a public way. In addition to trust, another faculty member at UCSB spoke about the "culture of respect" in the program, and the "culture of conversation around the [data use] work."

Fostering common knowledge. The collaborative cultures that grew around data use work aimed at program improvement also required the development of common knowledge and common language, as it did at ECU. A faculty member outside the School of Education (SOE)

at Alverno explained the importance of common knowledge and common language in their frequent cross-department collaborations:

> I think for us an institution, we have lots of ways to talk to each other about teaching practice. It doesn't matter if I'm talking to the education department, or if I'm talking to nursing, we have a common language about teaching that we can talk to each other with. I can engage in thinking about Praxis II… I can engage you guys, and the conversation, in a meaningful way.

This "common language about teaching" meant that the frequent cross-disciplinary data-related conversations that happened at Alverno could draw on the expertise of faculty both inside and outside the SOE. Though UCSB engaged in less cross-department collaboration than Alverno, they still relied on the "collective knowledge" of all program members: "I think one of the things that makes us really strong is that we do capitalize on the knowledge that… exists within the program. It's collective knowledge. It's not my knowledge" (TEP Director, UCSB).

Fostering distributed expertise. Trust, respect, and listening were important resources that facilitated the development of common knowledge and distributed expertise. A supervisor at UCSB used this trust to draw on the expertise of "a network" of colleagues as resources for individual and collective development:

> As an individual, I feel like I can go to anybody—and I do it—to be able to ask questions that for me are related to what I think they have to share with me. Each of us has our own strengths, and I think we use each other very wisely. That goes beyond the supervisors, so there's really a web, a network, that is continually moving.

When these individuals collaborate and share their strengths, it strengthens the collective expertise. A faculty member at Alverno explained: "There's an expectation that the reason why

somebody wanted you here, the group wanted you here, is because you have something to offer… We're a strong community when everybody has a voice." This notion of having "a voice" also mirrors findings at ECU, and the importance of connecting individual agency to a stronger, emergent sense of collective agency.

In a faculty focus group at Alverno, a faculty member connected the process of sharing expertise with a culture of distributed leadership:

> The reason why our curriculum is successful is because as faculty members, we all take leadership. It's a shared governance model.
>
> We believe in our curriculum. This is a curriculum that we all have a stake in through our ability departments and through our discipline. We're used to communicating with each other in a really respectful way that shows that we are all leaders in this… We have access to each other. We respect each other. We are leaders.

This distributed expertise, "culture of distributed leadership," and "shared governance model" facilitated a strong sense of shared responsibility for program outcomes. A program leader at Alverno described it as "we're all steering this ship fairly together."

Fostering shared responsibility. In all three programs, standardized performance assessments (PACT and edTPA) played an important role in facilitating cross-role collaboration because they were assessments that were "not owned by any one course or practice" (TEP Director, UCSB). The TEP Director at UCSB explained the importance of PACT in facilitating common knowledge, common language, and shared responsibility:

> PACT is important… because it's not owned by any one course or practice. It's a program wide assessment that everybody can understand now. Everybody knows what it is. We all know the rubric language. We can speak with each other using that language

> and the PACT evidence whenever there are external pressures for changes. I see it getting embraced in very thoughtful ways by everyone, by a large group of people, not just certain people who may know the program better and understand it better… There are certain things that are just not just seen as "this is supervisor work" or "this is course instructor work."

Though not speaking specifically about edTPA (partly because they have other holistic conceptual frameworks and program- and college-wide assessments that were created locally), a faculty member and program coordinator at Alverno spoke in a focus group about how faculty were committed to understanding the program and all the elements within it, such as individual courses and fieldwork placements: "It's that constant connection that people don't just feel ownership for a particular course, but that they want to know where their candidates are coming from and where the candidates are headed so that everyone is really sure that they are being prepared." Faculty and supervisors worked to understand the whole sequence of program curricula for each teacher preparation pathway in a holistic way "so that everyone is really sure that [candidates] are being prepared." A program administrator in a different focus group echoed this sentiment: "There is a shared responsibility on the part of the department to talk about their work together collaboratively and take what they're doing in that shared way and make continual adjustments based on all the factors they are seeing, including whatever data they're getting from [the Office of Educational Research and Evaluation]."

This growing sense of shared responsibility for program outcomes, and for making program changes that improve outcomes, required broad faculty engagement:

> Because so many people are involved it actually allows us to use the data… because so many people are involved there was kind of a shared burden. We're all going to score.

> OK. Then we also had then a common frame to talk about, so it wasn't as if five people had… generated a bunch of data and then came and said to the other 20, "Hey, look what we found." There were 30 of us saying, "Well, I found this. What did you find?"… Everybody had small pieces of the big picture, and so then we could build that mosaic and I think that's been why this program has been able to not only use the data, but… that has become the culture because we all do part of it. We all have our interests at the table. We are all investing. (Faculty, Focus Group, UCSB)

This broadened engagement resulted in a sense of shared responsibility in which everyone had their "interests at the table" and they "[were] all investing." Similarly, the UCSB TEP director said:

> The power of having something like a program wide, authentic, performance assessment of teaching is... certainly for us it's been one of the most critical factors in creating a more cohesive program, creating a more integrated university K-12 piece and in creating stronger faculty across the board; course instructors who know K-12 work, K-12 supervisors who are understanding more about the course work… These things wouldn't happen if it were not for the fact that we have this data that we are using all the time, every year, and everybody is using it.

Broadening stakeholder engagement through bridging practices. At ECU stakeholder engagement was in the process of increasing throughout the period of data collection, partly due to continued bridging practices that attempted to harness individual motives and agency for a collective agenda. At UCSB and Alverno these processes were still occurring, but for the most part broadened engagement had been established. One notable exception was some continued challenges engaging ladder faculty housed primarily in the

Department of Education at UCSB, which was related to the culture and personnel policies of their research-intensive university. They had made great strides, and more ladder faculty participated not only in teaching within TEP, but also in the data use work (including scoring PACT and edTPA) over time.

One bridging strategy to align the motives of ladder faculty with those of the TEP collective was to encourage faculty research on TEP to increase engagement by faculty with significant research responsibilities and expertise. A pre-tenure ladder faculty at UCSB explained:

> I really like being in both departments [TEP and the Department of Education] and then being able to use research in the TEP program in my classes, and then having this TEP population I've done research on be the students in my classes. That's a nice—it's almost like a lab school… [with candidates] that are learning to teach in a really interesting program.

ECU used a similar strategy, though they weren't an R1 institution. It still increased faculty visibility and helped them with promotion and tenure requirements when they engaged in programmatic research and related conference presentations and scholarly writing and publishing.

Developing new forms of interpersonal and organizational accountability. A faculty member at Alverno spoke about a sense of "being accountable to each other and being accountable to the student" in a way remarkably similar to the ECU faculty member who said: "We're accountable first to our students. Then when you do a project like this we're accountable to each other, but somehow here's that good sense of we're accountable to the profession." The Alverno faculty member explained:

> The collegial nature of the way that we work together… It's a form of accountability. By having the students—they're not being accountable to external accrediting bodies. They are eventually, but we're accountable to each other. If I teach them something in my course and you get them after that, I will have said that they are credentialed or validated or have the ability to do that, so by the time they get to your course, you can make that expectation that that's what they have learned and they're ready for the next course… That's a form of being accountable to each other and being accountable to the student, which changes the whole definition of accountability. The way we think about it is if you build in all those different levels of accountability across the curriculum, by the time the accrediting bodies come in, we can demonstrate where we've shown standards and performance and it becomes sort of a non-issue.

Though external pressures for data use and external accountability pressures are a reality for teacher education programs across this country, these three programs discovered through their expansive learning processes related to using data for program improvement that it's possible to focus on collective and collaborative conceptions of internal accountability and still meet external accountability requirements.

Chapter 8: Motivating and Supporting Collaborative Data Use: Lessons from Three Teacher Education Programs

Over the last several years, there has been an upsurge in rhetoric and policies promoting evidence-based accountability, including pressures to use specific assessments (such as edTPA) or data sources (such as value-added measures). Despite new and increased data use pressures and requirements, there has been surprisingly little research related to developing the will and capacity for teacher education programs to use data for program improvement purposes. This dissertation draws on an activity theory framework to investigate how three teacher education programs responded to increased external accountability policies requiring new and more extensive data use sources and practices. As these pressures mounted, all three programs faced a primary contradiction (Engeström, 1987) between increased external accountability demands and the desire to maintain a sense of internal accountability. This manifested in other systemic tensions and contradictions between extant and emergent program practices, structures, and norms. This study aims to illuminate the organizational, cultural, and social supports that helped programs address these contradictions, maintain a strong sense of internal accountability and local agency, and foster broadened engagement in collaborative data use by multiple stakeholders.

This study supports previous research from both the P-12 and teacher education data use literatures that suggests that distributed engagement and collaboration among many program participants are key to the development and support of data use practices that have the potential to foster individual and organizational learning (e.g., Anderson, Leithwood, & Strauss, 2010; Bunch, Aguirre, & Téllez, 2009; Peck, Gallucci, & Sloan, 2010; Peck & McDonald, 2013; Wayman & Stringfield, 2006). These literatures pointed to several important findings related to

motivating broadened engagement in data use: (1) the important role of individual beliefs, values, and knowledge in mediating the interpretation of data (Coburn, 2001, 2010; Coburn, Toure, & Yamashita, 2009; Coburn & Turner, 2011; Spillane & Miele, 2007; Young & Kim, 2010); (2) the value of using data for programmatic inquiry related to local values and goals (Cochran-Smith & Boston College Evidence Team, 2009; Copland, 2003; Peck et al., 2010; Peck, Gallucci, Sloan, & Lippincott, 2009; Peck & McDonald, 2013, 2014; Sloan, 2013; Stillman et al., 2013); and (3) providing organizational supports for collaborative stakeholder engagement in data use practices (Knapp, Copland, & Swinnerton, 2007; Means, Padilla, & Gallagher, 2010; Peck et al., 2010, 2009; Peck & McDonald, 2013, 2014; Sloan, 2013; Wayman, 2005; Wayman & Cho, 2009; Wayman & Stringfield, 2006; Wohlstetter, Datnow, & Park, 2008). I drew on those research findings in designing this investigation of stakeholder engagement in data use practices within the context of teacher education. This study seeks to extend those findings by exploring connections *between* the individual, interpersonal, and organizational supports for locally defined collaborative inquiry aimed at program improvement related to both internal and external accountability.

Previous research on data use in P-12 contexts and in teacher education also highlights, but offers relatively limited analysis of, the motivational aspects of teachers' or faculty members' participation in data use practices (Coburn, 2010; Peck et al., 2010, 2009, 2014; Peck & McDonald, 2013, 2014; Rennert-Ariev, 2008). Collaboration and relational dynamics, rarely foregrounded in studies of data use, are important to understand for teacher education programs interested in successfully fostering productive faculty engagement—rather than resistance—in data use. Understanding the motivation for and role of faculty engagement and collaboration in data use is critical for building knowledge about how teacher education programs can leverage

both external and internal accountability goals, as well as assess program progress and effectiveness. This study addresses these gaps in our collective knowledge by providing insights about *why* various stakeholders agree to engage in collectively-oriented, programmatic data use projects and practices, in addition to *how* they participate and what *interpersonal, cultural, and organizational resources and practices* support broadened engagement in collaborative data use practices.

This study examines issues around stakeholder engagement in collaborative data use practices in three teacher education programs housed within institutes of higher education that represent very different institutional types: UCSB is a large, research-intensive public university; ECU is a large regional producer of new teachers and has by far the largest number of pathways and candidates of the three programs; and Alverno College is a small, mostly undergraduate liberal arts college. These three programs are also situated in different state and policy contexts, thus contending with some similar (national or accreditation-related) and some different (state- or institution-specific) external accountability demands. Despite their different institutional contexts and needs, there were remarkable similarities in the supports and strategies that fostered broadened participation in collaborative data use practices.

In the following sections, I summarize this study's cross-case findings related to the organizational, interpersonal, and cultural resources and practices that helped these three programs (1) address internal and external contradictions that arose, and (2) broaden program member engagement in data use as part of an ongoing organizational learning process. I then consider implications of this study for the field of teacher education and for studies of organizational change and expansive learning.

Organizational Resources and Practices

All three programs created *time* and *space* for collaborative data use practices by creating or modifying collaborative structures. They integrated data analysis and decision making activities into regular meetings (e.g., program and/or department meetings; faculty meetings; supervisor meetings); created meeting structures for sub-groups or committees related to particular aspects of program assessment or innovation (e.g., what the dean at ECU called "research communities of practice"); and implemented various forms of regularly scheduled data retreats. Key features of the design and orchestration of these collaborative structures included the strategic incorporation of as many program members (including tenure line faculty, adjunct faculty, supervisors, and administrators) as possible; program leaders' attention to figuring out ways for the data use activities taking place within these structures to be motivating and engaging for all stakeholders (e.g., not just for math methods instructors); and clearly articulating meeting or retreat goals as collective learning goals.

All three programs provided organizational resources aimed at increasing faculty access to program outcome data for individual and collective use. At both Alverno College and ECU, this included strategic investment in data platforms that both organized and provided access to various data sources. These data platforms were designed and revised to address the needs of multiple stakeholders. At UCSB, they did not have a singular data platform, but rather shifted the programmatic division of labor in order to make sure that faculty had access to digestible representations of data. For example, the program created the position of PACT coordinator to analyze PACT data and continuously communicate with administrators, faculty, and supervisors about program results (often through digestible representations of aggregated and disaggregated PACT data). They also used various technological tools to access data, including email and

shared drives. In addition, all program members had access to some PACT data through local scoring practices.

Each program modified organizational norms and practices to reify their shifts towards valuing collective work in addition to individual achievement. For Alverno College, the majority of their organizational norms and practices already explicitly valued collaborative learning, and had for many decades based on their institutional mission, values, and history. For example, their promotion and tenure requirements already valued participation in various collaborative groups and structures that incorporated data-related activities aimed at collective and programmatic learning and development. However, program leaders also sought to continuously improve those policies and practices as necessary. For example, they increased the engagement of part-time faculty and supervisors by having some discussions related to program evaluation occur on the online platform Moodle.

UCSB began a programmatic shift towards valuing collaborative program evaluation and improvement in the context of their participation in the PACT Consortium and their use of PACT (and now edTPA) data for program improvement purposes. They began instituting formal and informal policies and practices supporting collaborative data use throughout PACT implementation; this included incorporating expectations that all faculty members and supervisors score about three PACT assessments each year, participate in regular data retreats, and incorporate content and skills related to the PACT/edTPA frameworks into the aspects of the program curriculum that they were responsible for (e.g., incorporating academic language into disciplinary courses). One important support for their distributed PACT/edTPA scoring policy was suspending normal activities (e.g., classes and candidate supervision) for "scoring week".

ECU dealt with the largest number of teacher candidates, the most pathways to certification, the largest number of programs outside the College of Education, and the shortest history (relative to the other two cases) of strategic investment in evidence-based program improvement efforts. The change process and the organizational aches and pains associated with change were most visible at ECU. Program leaders changed policies related to promotion and tenure, including decreasing faculty course load requirements and adding a "fourth box" for work aimed at collective goals (e.g., participation in research and development of the many program innovations they were implementing during our data collection). They also worked to reallocate organizational resources (both financial and human) to support program member engagement in data use and decision making. For example, they incorporated course buy-outs for faculty to work on collective projects, and financially supported increased conference participation.

On the human side, program leaders created and staffed the Office of Assessment and Accountability. They made sure administrators and staff members associated with that office supported faculty access to data; facilitated data use activities that incorporated multiple stakeholders; and executed much of the data use work aimed at external accountability (such as accreditation reporting), thus facilitating faculty engagement in data use work that was more oriented towards local needs and goals. These policy and resource allocation changes were similar to those at Alverno and UCSB, but at those two programs many of the changes happened before our data collection began and they were in later stages of organizational development relative to programmatic data use.

Interpersonal Resources and Practices

All three programs demonstrated interpersonal *bridging practices* aimed at motivating program members to engage in work that was rewarding to the collective, including data-informed program improvement efforts). These practices connected individual and collective motives, agency, knowledge, expertise, and responsibility. This interpersonal work involved the development and use of relational agency, relational expertise, and organizational narratives that articulated and re-articulated the object and direction of change (Edwards, 2007, 2010, 2012). It also involved listening to and building relationships and trust with *all* program members, including those traditionally not included in programmatic meetings and conversations in which programmatic decision making occur (e.g., supervisors). This required listening not only to individual ideas related to the ongoing work, but also to disagreement with and resistance to the direction of change. By including more program members in data use practices and related decision making, program members had opportunities to co-construct program goals and consider potential means of achieving those goals, such as changing aspects of program curricula and field experiences.

These bridging practices occurred continuously, and could happen at any time to address resistance by individuals or groups and tensions or contradictions that arose. However, in general bridging individual and collective motives and agency needed to happen towards the beginning of expansive learning processes in order to ensure increased individual acceptance of a collective agenda. The process of incorporating individuals willingly into collective work—thus broadening engagement—facilitated the continued evolution of co-created object(s) of activity and the processes and practices aimed at those goals.

Cultural Resources and Practices

As these three programs engaged in bridging practices over time, support for collective goals and the individual and collaborative practices that would help them achieve those goals increased. The cultures of these programs shifted to include more voices. As the expansive learning processes continued, supported by interpersonal bridging practices, the programs all saw an increase in acceptance and co-construction of data use practices aimed at program improvement; an increased sense of collective agency and recognition of the power of collective agency; an increase in common knowledge that fostered and encouraged more distributed expertise and distributed leadership within the programs; and an increased sense of shared responsibility and accountability for program outcomes. The co-constructed collective motives, collective agency, common knowledge, distributed expertise, and sense of shared responsibility became important cultural resources that program members could draw on to maintain and expand their object-oriented collective work.

Implications for Teacher Education

The findings from this study suggest that the process of developing support and capacity for broadened collaborative engagement in data use practices required simultaneous attention to organizational, cultural, and social dimensions of the change process. Organizational structures and resources that shifted the ways in which the programs valued collaborative data use work by different stakeholders supported new collaborative data use practices. This involved shifts in the division of labor amongst program members; shifts in program or department-wide norms and policies, such as required teaching loads and tenure and promotion policies; and shifts in monetary resources and incentives for collaborative work. These three programs also motivated and supported increased faculty engagement in data use practices by developing interpersonal

bridging practices and cultural resources that fostered individual and collective agency as well as the alignment of individual and collective goals.

Study findings suggest that programs interested in data-informed program improvement goals need to attend to interpersonal, cultural, and organizational shifts simultaneously and continuously. Program leaders would need to motivate individual engagement in collective work; strategically involve *all* program members, including faculty and supervisors; articulate how individuals might benefit from the collective agenda; continuously articulate and re-articulate a comprehensive vision for data-informed program improvement; create ways for individuals to inform and co-create the collective vision; set up structures to facilitate collaborative data use and decision making activities; set up incentives and supports for individuals to participate in those collaborative activities; adjust program norms to emphasize the value of collective work; reify those values in tenure and promotion policies; make data available to program members through both technological tools such as data platforms as well as in the context of collaborative structures; listen to program members and attend to disagreement and dissent in ways that respect individual expertise and agency but work towards creating distributed expertise and collective agency; and continuously learn from and collaboratively revise programmatic data use practices and policies. This is no small task.

One major obstacle to this type of collectively constructed work that aims to include individuals who bring unique voices, histories, identities, expertise, and practices in teacher education is the traditional culture of higher education that prioritizes individual autonomy and academic freedom (Hamilton, 2002; Olivas, 1993). On the one hand, previous research in teacher education indicates that strong professional agency for teacher educators not only makes them more committed to their work, but also supports professional development and workplace

learning (Hökkä & Eteläpelto, 2014; Hökkä et al., 2008; Vähäsantanen et al., 2008). On the other hand, Hökkä and Eteläpelto found that "strong individual agency could, in fact, be an obstacle for organizational development in that it limits collaborative practices, impedes cultural change, and hampers organizational learning" (2014, p. 47).

This study supports the idea that when individuals embraced a sense of *collective agency* rather than solely prioritizing individual agency and autonomy, program members were able to continue an organizational learning process oriented towards a co-constructed and expanding object related to data use for program improvement. When outcomes from this work became more concrete, and the mutual benefits to individuals and the collective became more visible, this collective agency helped spur the development of a more distributed network of expertise amongst program members and an increasingly shared sense of responsibility and accountability.

Sustainability is a major challenge for teacher education programs interested in data-informed program improvement given the complexity of negotiating organizational change in ways that attend to interpersonal, cultural, and organizational shifts simultaneously. A related challenge is the reliance on grant funding for some of these initiatives (such as the TQP grant at ECU); programmatic incentives and practices may not be sustainable once grant funds and supports expire. In addition, the key role of program leaders in orchestrating these processes at multiple levels simultaneously means leader turnover may leave programs unable to maintain the commitment to and capacity for data-informed program improvement.

Previous scholarship on data use in P-12 environments suggested that some schools were able to continue data-related practices over time by distributing leadership and expertise and hiring personnel that shared similar values and practices related to data use (Copland, 2003). A similar strategy was seen at Alverno College; the School of Education (SOE) consciously and

strategically approached potential leadership turnover by creating distributed leadership structures. During the course of study data collection the dean of Alverno's SOE, a leader with a strong commitment to inquiry- and improvement-oriented collaborative data use, left the college. Since this was a planned change, they had set up a leadership structure in which the dean worked closely with two associate deans. When the dean left in 2014, one of the former associate deans became the new dean of the SOE and the other associate dean retained her position.

At the time of this leadership change, they created a new, even more distributed leadership structure that involved not only the new dean and associate dean, but also the directors of each of the teacher education programs and pathways. This new distributed leadership structure met more regularly and distributed leadership and administrative responsibilities differently than under the previous leadership structure. This meant that when another, unplanned dean change occurred about a year later, one of the program directors who had participated in this distributed leadership structure was able to step up as acting dean with the continued support of the existing associate dean and other program directors.

Implications for Studies of Organizational Change and Expansive Learning

Most research from an activity theory perspective focuses primarily at the level of collective activity and its relationship to organizational structures and resources. These studies contribute important insights into understanding processes of organizational change and expansive learning, but often ignore or underspecify the important role and contribution of individual learning, identity, agency, and motivation (Billett, 2006, 2008a; Edwards, 2007, 2010; Engeström & Sannino, 2010). For example, Engeström, Keruso, and Kajamaa (2007) identified several "bridges" that attempted to alleviate breaks in the cycle of expansive learning in two healthcare organizations. These bridges were identified primarily as systems-level decisions and

actions. This study expands on the key, though underdeveloped, assumption that individuals play important roles in bridging actions within processes of expansive learning.

In activity theory there is a crucial but underconceptualized relationship between individual motives and agency and organizational development and change. Activity theory has largely ignored the role of human subjectivity and the dichotomy between individual and social dimensions of activity (Miettinen, 2005; Stetsenko, 2005). Engeström and Sannino (2010) argued that: "The most important outcome of expansive learning is agency—participants' ability and will to shape their activity systems. A major challenge for the study of expansive learning is to conceptualize and characterize empirically the new forms of agency involved in expansive processes" (p. 20). In that paper they also explained:

> There is a risk that the theory [of expansive learning] is split into the study of collective activity systems, organizations and history on the one hand and subjects, actions and situations on the other hand. This is exactly the kind of split the founders of activity theory set out to overcome. To bridge and integrate the two directions, serious theoretical and empirical efforts are needed. (Engeström & Sannino, 2010, p. 21)

In this study, I connect institutional structures and resources that support organizational change with interpersonal actions and activities that motivate engagement, foster collective agency, and are the driving force of organizational change.

I use the concept of *bridging* to describe how individuals connect with the collective in organizational change and expansive learning. I examine five key bridging actions that served to continue productive joint work oriented towards an expanding object. These are: bridging individual and collective motives, bridging individual and collective agency, bridging individual and collective knowledge, bridging individual and collective expertise, and bridging individual

and collective responsibility. These bridging practices helped the programs overcome tensions, double binds, and misalignments of motives and goals amongst and between individuals and collectives that surfaced during the process of organizational change. They acted as interpersonal resources in the expansive learning process, serving to "[articulate] and [re-articulate] the direction of change" (Engeström et al., 2007, p. 333) and shift community values and norms in ways that supported change efforts. These practices helped the programs continue on a process of expansive learning (Engeström, 1999; Engeström & Sannino, 2010) oriented towards an emergent object related to data use for program improvement.

Figure 5 articulates my findings related to the social resources that support organizational change efforts. The overall context is an activity theory framework. The components of the activity system (e.g., rules; division of labor) and the relationships among those components provide structural and organizational supports for expansive learning. Within the activity system's expansive learning process, the bridging practices described above mediate and connect the subjects and the object of activity. Over time these bridging practices, and the organizational resources and practices that support individual subjects' engagement in joint work within the activity system, have the potential to lead to cultural outcomes that include: the co-construction of collective motives related to the object of activity, collective agency, common knowledge, distributed expertise, and a sense of shared responsibility. These cultural outcomes act as organizational resources that further support expansive learning efforts.

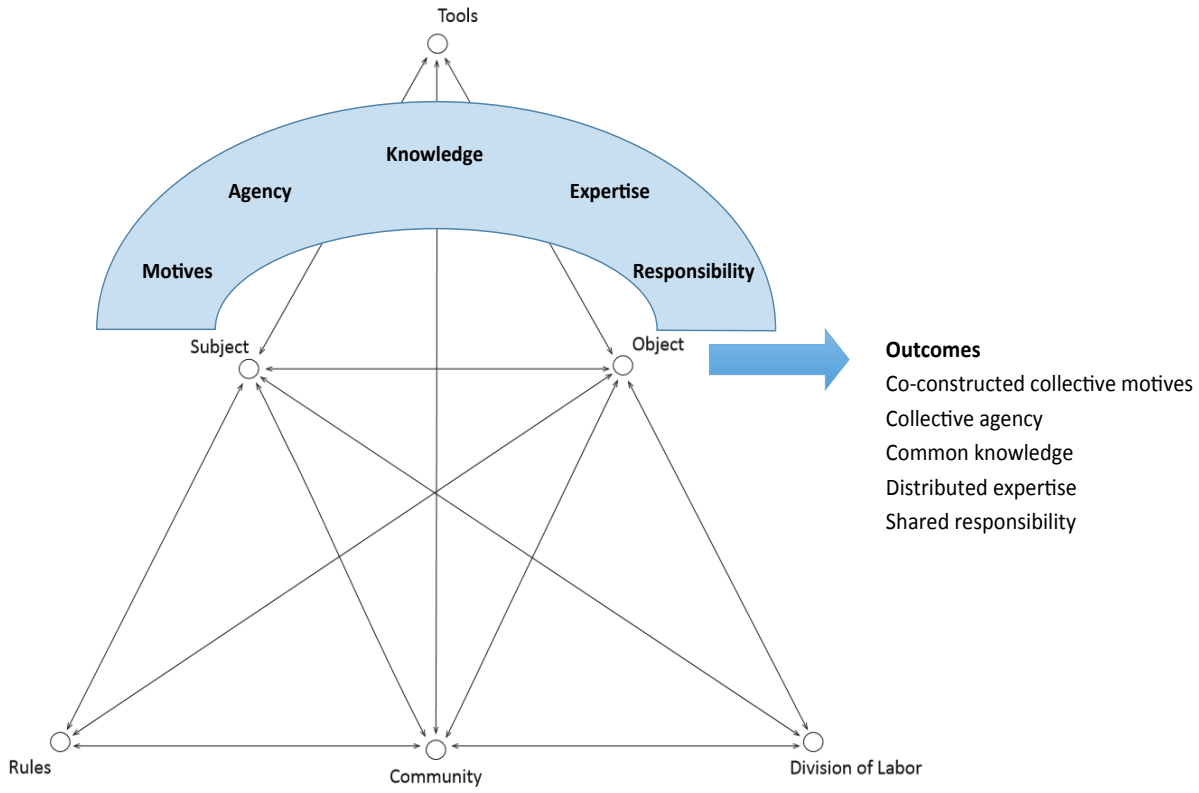

Figure 5: The role of bridging practices in activity theory

Limitations and Contributions

The primary limitation of my study is that my findings are not generalizable across teacher education programs due to the nature of the qualitative comparative case study design. Qualitative case studies do not generalize to populations, but rather facilitate analytic generalization (Yin, 2009). Faculty engagement in collaborative data use practices might be supported and constrained in different ways in different organizational, state, or national contexts. However, the in-depth nature of a qualitative case study allowed me to generate rich descriptions of data use practices as well as the interpersonal, cultural, and organizational mediating factors for faculty engagement in those practices within this study's particular contexts. These rich descriptions will provide information that readers can use to consider

whether and how my findings are applicable to other contexts (Lincoln & Guba, 1985). In addition, the similarities in organizational and social practices that supported data-informed program improvement efforts despite the significant regional and institutional diversity of the three cases strengthens the generalizability of my findings.

Limited time and resources, combined with the distance between my location and the location of the three cases, constrained opportunities for more observations and interviews. Future longitudinal and ethnographic research with more frequent and sustained observations and interviews that focus on the nature and role of bridging practices in expansive organizational learning would be a significant contribution to both our understanding of collaborative data use in teacher education and our understanding of the relationship between individuals and the collective within activity theory.

Despite these limitations, this study aims to illuminate the process of collaborative data use, including attention to the practices themselves; who participates, why, and how; and what supports or constrains engagement in goal-oriented data use practices. This research addresses the field's limited understanding of data use in teacher education, and more specifically the motivational and relational aspects of faculty engagement in data use practices at a time of increased external accountability pressures. Perspectives from activity theory and workplace learning, particularly those that illuminate the relationship between individual and contextual dynamics by focusing on joint activity, offer conceptual guidance in this investigation.

Understanding the role of faculty engagement and collaboration in data use is critical for building knowledge about how teacher education programs can leverage both external and internal accountability goals, as well as assess program progress and effectiveness. As accountability policies and mandates intensify nationally, a key question related to data use—

how the work of data use can be accomplished to meet those mandates while also furthering local values and goals—rests in large part on distributing the work across program members and engaging the faculty and supervisors who are responsible for enacting the curriculum. And yet because collaboration and relational dynamics are rarely in the foreground of studies of data use, we know little about how teacher education programs might successfully foster productive faculty engagement, rather than resistance, in data use. This dissertation attempts to begin to fill this gap by looking more directly at the nature and role of faculty, supervisor, and program leadership's engagement in data use, as well as the role of motivation and agency. It illuminates both challenges and opportunities for using evidence for program improvement in teacher education.

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Appendix A: Coding Structure for the Larger Study (Used for Phase One Analysis)

Context/history	**Policies, practices, or events that have influenced current practice**
Individual history/identity	Images or narratives about characteristics of the "self" and previous experiences that are articulated by or about an individual includes values, individual expertise
Program features	Program size, number/type of programs/routes, and other program characteristics
Program context/history	Program context/history
Program policy	Policies at the program level
University policy	Policies of the university or college
State policy	Policies of the state government or state organizations
National/federal policy	Policies of the federal government, or national organizations (e.g., NCATE, TNE) that influence data use
Data	
Data sources	Various kinds of program outcome data, including test scores, value added estimates, performance assessments, surveys and focus groups (these are sub-codes)
- Survey	Survey data
- Performance assessment	Performance assessment data
- Value added	Value added data
- Informal data	Data sources that are unique to the program, which have not been subject to psychometric analysis
Data platform	Technical tools for archiving, organizing, and accessing data
Data access	Can individuals or collectives get the information that they need to make program decisions? (whether or not they share the data is about data use) Formal and informal processes of access
Data use processes	Social/ organizational practices used to organize and interpret data once they have been collected Particular kind of engagement from an organizational level
Data utility/purpose	The relative usefulness of a particular data set for deliberation and decision making
Engagement	
Agency	Perceived opportunities for action 'Can do' attitude Describes quality of engagement (will always double code with engagement)
Faculty engagement	Describes processes of participation in data-related work
Supervisor engagement	Describes processes of participation in data-related work
CT (cooperating teacher)/community engagement	Describes processes of participation in data-related work by CTs or community members/other stakeholders
Staff engagement	Describes processes of participation in data-related work

Org Supports & Practices	
Collective/distributed expertise	Knowledge of how to do things is shared across program participants, rather than concentrated in one or a few individuals Acknowledgement of different kinds of expertise coming to the table
Collaboration	Two or more individuals intentionally aligning their work around the same goal (formal and informal) All collaboration is a form of engagement Will always be double coded with engagement
Common language	Development/use of common and concrete language of practice Shared understanding and way of talking about the work
Communication	How information is shared between individuals or groups See Engeström (from Teams to Knots)
Decision-making	Actions chosen related to program content, structure or process; Whether and how stakeholders participate in decision-making processes
Disagreement	Conflicts in deliberation, data interpretation or decision making
Inquiry	A motive/process aimed at augmentation of new knowledge, resolution of a question or solving a problem Inquiry stance
Leadership	Personal descriptions/qualities/actions that orient others toward a common understanding and/or coordinated action in relation to a goal or problem
Meetings	Formal and informal gatherings of program faculty and staff related to operating the program
Organizational budget/resources	Fiscal, human and operational resources related to data use
Personnel	Program policies and practices related to staffing, job descriptions, expectations Division of labor (see Engeström/CHAT)
Program Culture	Mission, vision, goals, values of program Ways of doing decision: separate program culture and identity Sub-categories: trust, values, goals
-Goals	Goals
-Trust	Trust
-Values	Values
Program identity	Statements (verbal, written, or graphic) which articulate shared values and unique sense of "who we are here"
Tools	Concrete tools (not conceptual tools) (e.g., observation protocols, etc.) Code data sources as a tool when they're talking about using it as a tool (depends on the nature of the talk)
Outcomes	Outcomes
Losses	Policies and practices that were (or may still be) valued but are no longer continued
Program changes	Changes in program structure, curriculum, pedagogy or policy

	related to data use
Sustainability	Whether or not people are thinking about sustainability Strategies and/or practices related to sustaining data use over time
Outliers	
Implementation process	Actions related to planning and enacting policies and practices related to data use
Juicy quotes	Quotes that ***show*** an important idea or event related to data use
TC experience	Discussion of teacher candidates' experiences in the program, particularly as these experiences relate to assessments, data use, and program changes

Appendix B: Summary of Data Use Conditions and Practices for all 10 Cases Included in Phase One Analysis

Alverno College TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members (faculty, supervisors, administrators) as a collective	- Tenure line faculty, adjunct faculty, supervisors, cooperating teachers, administrators - Relatively small undergraduate and graduate programs in a Catholic liberal arts college context
Object: The purpose of the work from the perspective of program members	- Outcomes orientation to student learning a longstanding aspect of the college mission and values - Program members shared a strong, cohesive vision of program goals - Strong internal sense of accountability; "We really started our own sense of accountability and our responsibility communally to take responsibility for our students' learning before that was a push in the political scene" (Program Admin) - Program leaders try to leverage policy changes requiring a standardized performance assessment to help assess and meet program goals - Program members identified continuous improvement as a key aspect of program goals
Tools: The conceptual and material tools that mediate data use practices and outcomes	- Several data sources, including internal data (e.g., internal performance assessment data, student self-assessments, candidate satisfaction surveys) and edTPA - Long history using internal performance assessments fostering smooth adoption of edTPA - PACT helpful because it's a program-wide tool, shared by all members - Approaching edTPA as an opportunity to improve existing data use practices - Scoring edTPA (and internal performance assessments) fosters common language and shared understanding of the program - Diagnostic Digital Portfolio (DDP) is their data platform; has some pros and cons; " the heart of the DDP is the self-assessment and the feedback related to the institutional and then program outcomes." (Faculty) - Faculty working towards "next generation" replacement for DDP; co-constructed with an external provider who is a "fan of Alverno" and sees the benefit of building more performance-based assessment features into their system - Strongly value self-assessment (all Alverno assessments involve self-

	assessment component); interested in interplay between performance assessment and self assessment as "two forms of knowing"
Rules: The explicit and implicit norms and regulations that guide program practices	- Outcomes orientation to student learning a longstanding aspect of the college mission and values - Changes to state policy required programs to use standardized performance assessment (program voluntarily piloted edTPA before the policy went into effect) - Data has always been integral to decision making related to program improvement - Faculty and supervisors expected to incorporate edTPA framework into their practice - Extensive schedule of meetings for various groups, including departments, ability groups, School of Education Liaisons, and the entire college faculty; also regular data retreats - All program members expected to participate in data retreats and program-wide meetings where data use activities occur - Many program members expected to score edTPA - Data use activities are an official part of faculty and supervisor expectations and are part of regular program culture and routines - Strong formal and informal communication within and between departments; "we're a talky place" - Commitment to developing organizational structures that encourage data use; e.g., meeting structures have morphed to involve more data use activities
Community: The characteristics, values, beliefs, and ideologies held by program members	- Increased visibility related to edTPA participation - Strong inquiry orientation to data use - Outcomes orientation to student learning a longstanding aspect of the college mission and values - Distributed approach to leadership and collaborative data analysis practices - Strong faculty collaboration related to long history of programmatic data use activities - Development of common language of practice related to internal performance assessments and abilities framework, and now also edTPA - Inquiry orientation and collective agency related to an internal locus of control - Shared responsibility to program outcomes a strong program value, related to extensive collaboration, the development of a common language of practice, and understanding of others' roles in the program - Faculty feel they are "never [encouraged] to stop talking" and are always listened to - Strong culture of collaboration and distributed expertise
Division of Labor: Policies and practices	- Data use activities are an official part of faculty and supervisor expectations and are part of regular program culture and routines - Collaborative data use activities are an official aspect of hiring and

related to the differentiation of programmatic roles and responsibilities	promotion criteria - Program administrators and staff engage with all data sources, including quantitative data, and are the primary people responsible for external reporting requirements - All program members, including faculty and supervisors, engage with performance assessment data - Various committees and sub-groups take on data analysis tasks - Program leaders position faculty to make programmatic decisions; distributed leadership
Outcomes: Outcomes of collective action made towards the object	- Faculty have made several changes to both individual course and field work curricula, as well as program curriculum overall; e.g., the way courses are offered and policies about how students are advanced - Changes to the content of meeting times (e.g. More data-related conversations; including discussion of new data sources)

California State University, Northridge (CSUN) TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members as a collective	- Largest producer of new teachers in CA, but experiencing enrollment drop (historically ~ 1200 grads/yr, currently ~600 grads/yr) - CSUN one of 23 CSU campuses - Multiple pathways, e.g., undergraduate program, post-BA programs, MIT, and field-based programs for practicing teachers on emergency credentials
Object: The purpose of the work from the perspective of program members	- Data-oriented program improvement widely shared goal - Some inquiry orientation at leadership level — not completely shared at faculty level - Cal State system-wide comparisons drive deficit orientation to the inquiry and action processes
Tools: The conceptual and material tools that mediate data use practices and outcomes	- System-wide "Chancellor's Survey" which measures satisfaction outcomes for both graduates and employers - Chancellor survey comparisons across programs drove questions about "why are we doing so poorly" - Local survey measures from field supervisors - PACT data - CSUN Dean led past and current efforts to get VA data for graduates (i.e. Working on MOU with LAUSD) and, where possible, have found them moderately useful (limited by small sample sizes) - Informants suggested each of these data sources had value for specific purposes, and for specific program constituencies - Multiple data sources are used to triangulate findings, including direct examination of artifacts of teacher practice - Development of a sophisticated data platform (platform is designed to integrate and provide data at multiple levels—program, College, University), but some ongoing challenges related to building a data platform that is usable and used (faculty use/usability not a priority)
Rules: The explicit and implicit norms and regulations that guide program practices	- Data analysis activities are organized in ways that map onto faculty roles/responsibilities - CSU Chancellor instituted strong policies related to accountability and program improvement, including developing a system-wide outcome measurement survey, and related program improvement planning and reporting policies for all of the TE programs in the system - State required standardized TPA; CSUN adopted PACT - State requires bi-annual program outcome reports - Committees linked to reporting requirements - Data retreat ('data crunch lunch') for faculty & supervisors to analyze data together; participants paid $100 and given lunch - Described other meetings for faculty and supervisors to discuss PACT data,

	including analyzing videos and artifacts together - TNE participation - Faculty use is not an important concern in development of the data platform
Community: The characteristics, values, beliefs, and ideologies held by program members	- Some faculty enthusiastic, some resistant. Leaders deal with resistance partly by encouraging agency, ownership, and joint responsibility - Strong focus on data-based decision making and program improvement at CSU system level, Dean's level, and they supported development of program practices and supports to move that down to program level too (though we saw variation in program and faculty engagement, including faculty resistance, "academic freedom" rhetoric, time & space issues, etc.)
Division of Labor: Policies and practices related to the differentiation of programmatic roles and responsibilities	- Assessment coordinator creates tables and other digestions of data, then gives them to the departments to analyze and make data-based decisions about their programs; each department reports on those decisions and improvements for bi-annual reports - Unit assessment committee meets periodically (includes all dept. chairs & each dept.'s assessment coordinator & each dept. assmt comm. Members invited) - "Bottom up" approach: "everybody's involved and it's a collaborative enterprise. It has to be collaborative; it can't be top down" (Associate Dean) - Almost all faculty (about 12 out of dept of 15 or 16) and many supervisors score PACT (about 40 scorers total)
Outcomes: Outcomes of collective action made towards the object	- Several program changes related to Chancellor's survey & PACT mentioned - Some program changes were based on PACT requirements rather than outcome data (e.g. Including more about academic language in curriculum bc it's a PACT requirement) - PACT/TPA data were most influential with faculty - Development of a sophisticated data platform, but some ongoing challenges related to building a data platform that is usable and used - Primarily an "add-on" approach to the work

East Carolina University (ECU) TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members as a collective	- Tenure line faculty, adjunct faculty, supervisors, cooperating teachers, administrators - Large program, many different certification routes regulated through the COE & other departments within a large public university - Prepares 750-800 new teachers a year
Object: The purpose of the work from the perspective of program members	- Over time the use of evidence has become an important aspect of efforts to improve the program and refine program goals - Program leaders try to leverage policy changes and increased data and data use activities for program goals
Tools: The conceptual and material tools that mediate data use practices and outcomes	- Many data sources, including internal data (e.g., candidate satisfaction surveys), state-level value-added data, and edTPA - TQP grant, TPAC participation (increased national visibility) - Office of Assessment and Accreditation (developed in response to increased accountability policies and increased data) - Data platform (technological tools developed/adopted and continually evaluated and revised with faculty input; provides access to data for program members); TracDat & Taskstream - Pirate Code (conceptual tool regulating pilot efforts related to data use) - edTPA building a common language of practice for program members - Scoring edTPA fosters common language and shared understanding of the program
Rules: The explicit and implicit norms and regulations that guide program practices	- Strong state accountability context required an increased emphasis on evidence, program outcomes, and data-based decision making - Data is becoming increasingly integral to decision making related to program improvement - Regular monthly meetings, data summits - Assessment Accreditation Committee meets monthly - Internal locus of control; program leaders reframing accountability as internal responsibility of the program to their program goals - All program members expected to score edTPA - Procedures in place for piloting and evaluating curricular reforms related to data use
Community: The characteristics, values, beliefs,	- Increased national visibility related to TPAC and edTPA participation - Increased inter-university collaboration through the dean's consortium related to value-added data - Distributed leadership and collaborative data analysis practices

and ideologies held by program members	- Some faculty increased their visibility within their departments because of their work with edTPA - Evidence of using dissent as a resource in the change process - Collective agency related to an internal locus of control - Shift from compliance to inquiry orientation to program improvement - Development of common language increased faculty collaboration and empowered some program members to engage in new forms of participation
Division of Labor: Policies and practices related to the differentiation of programmatic roles and responsibilities	- Remaining issues with state value-added data analyses and need for access to the data and "drill down" analyses - Department of Assessment staff analyze data sets to facilitate easier faculty access to data and decrease faculty workloads related to external reporting - Assessment Accreditation Committee - Increase in collaborative data analysis - Program leaders strategically prepare data for data summits to facilitate collaborative data use practices - Program leaders position faculty to make programmatic decisions; distributed leadership - Workload adjustments, e.g. supervisor workloads adjusted to allow them to score edTPA - Shift in faculty workload and expectations to include data use as "providing service back to the program"
Outcomes: Outcomes of collective action made towards the object	- Many course and program-level changes, including creation of new curricula and assessments - Wide variety of changes in program policies, curricula, and instructional practices - Faculty engaged with new sources of data in various ways; increased faculty buy-in - Increased collaboration, e.g. faculty sharing syllabi and revising courses together

Louisiana Resource Center for Educators (LRCE) TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members as a collective	- LRCE is an early entry alternative route program, started in 2003, which produces about 150 teachers a year - Program has a seven week summer institute, followed by additional observations and "learning team" seminars conducted by part-time, adjunct faculty during the candidates' first year of teaching - Made up of program leaders plus adjunct, part time (expendable) faculty; Board of Directors oversees program
Object: The purpose of the work from the perspective of program members	- Public perception re: value added (VA) scores and competition for applicants was clearly important - Compliance orientation (e.g., they had low reading scores and reading was the only aspect of the program they addressed)
Tools: The conceptual and material tools that mediate data use practices and outcomes	- Data sources: value added; "informal" data (ie admissions & placement data; survey data e.g., course/seminar evaluations) - Leaders pretty much only discussed using VA data to make curricular decisions but other data talked about in faculty FGs (though only in support of improving the reading aspect of the program, identified by VA data) - Faculty created new observation tool to learn about how the new reading curriculum was working after TCs completed program
Rules: The explicit and implicit norms and regulations that guide program practices	- Strong state accountability policies - New VA measures & new COMPASS teacher evaluation system when data collection occurred - "No one really understands" what the value added measures really mean (Program Administrator) - Budget concerns articulated related to program changes (particularly because they needed Board of Directors' approval) - Hierarchical decision making - Faculty/supervisors now using state COMPASS rubric for TC observations
Community: The characteristics, values, beliefs, and ideologies held by program members	- The program is highly entrepreneurial, and the program leadership pays close attention to alternative route competition - They identify as a program that can respond quickly to the need to change; small, agile program - Lack of philosophy running through program curriculum identified as a problem by program administrator - Philosophical stance of both the executive director and program director were generally consonant with the principles underlying state policies emphasizing program accountability

Division of Labor: Policies and practices related to the differentiation of programmatic roles and responsibilities	- Exec. Director & program director have a lot of control and decision making power - All faculty and "practitioner advisors" (supervisors who do classroom observations) are adjunct & part time (and considered expendable by program leaders) - Executive director clearly had decision making power when VA data came out - she framed the problem and solution and took her ideas to the board, then executed them by hiring reading specialist - Have to pass program decisions through Board of Directors
Outcomes: Outcomes of collective action made towards the object	- Hired reading specialist and changed reading curriculum - Faculty created new observation tool to learn about how the new reading curriculum was working after TCs completed program

University of California, Santa Barbara (UCSB) TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members as a collective	- Tenure line faculty, adjunct faculty, supervisors, cooperating teachers, administrators - Relatively small, selective graduate-level program in a large, research-intensive university (75-115 graduates/year)
Object: The purpose of the work from the perspective of program members	- Over time the use of evidence, particularly from PACT, has become an important aspect of efforts to improve the program and refine program goals - Program leaders try to leverage policy changes requiring a standardized performance assessment to help assess and meet program goals - Program members shared a strong, cohesive vision of program goals - Program members identified continuous improvement as a key aspect of program goals
Tools: The conceptual and material tools that mediate data use practices and outcomes	- Several data sources, including internal data (e.g., candidate satisfaction surveys, video of candidates) and PACT - Long history of PACT fostering smooth transition to edTPA - Candidate artifacts particularly useful for engaging faculty in collective data use work - PACT helpful because it's a program-wide tool, shared by all members - PACT building a common language of practice for program members - Scoring PACT fosters common language and shared understanding of the program
Rules: The explicit and implicit norms and regulations that guide program practices	- Changes to state policy required programs to use standardized performance assessment (they used PACT, and now use edTPA) - Data is becoming increasingly integral to decision making related to program improvement - Faculty and supervisors expected to incorporate PACT/edTPA framework into their practice - 2-3 data retreats a year, monthly program meetings - All program members expected to participate in data retreats and program meetings where data use activities occur - All program members expected to score - Regular activities suspended for 'scoring week' to create time and space for everyone to score 3 portfolios - Scoring now written into job descriptions and part of regular program culture and routines
Community: The characteristics, values, beliefs,	- Increased visibility related to PACT and edTPA participation - Strong inquiry orientation to data use - Cultural norm: "not afraid of data"; related to PACT participation - "Culture of respect" and trust amongst program members, including program

and ideologies held by program members	leaders - Distributed approach to leadership and collaborative data analysis practices - Increased faculty collaboration related to scoring and PACT data use activities - Increased use of common language of practice related to PACT - Inquiry orientation and collective agency related to an internal locus of control - Increased value of shared responsibility to program outcomes related to common language of practice and increased understanding of others' roles in the program
Division of Labor: Policies and practices related to the differentiation of programmatic roles and responsibilities	- Approximately 50% of ladder faculty teach in TEP - All program members expected to score 3 PACT portfolios - Graduate students help with scoring to make it more manageable - PACT coordinator and/or program director create digestible representations of data for data retreats and other data use activities - Program administrators and staff engage with all data sources, including quantitative data, and are the primary people responsible for external reporting requirements - All program members, including faculty and supervisors, engage with PACT data - Increase in collaborative data analysis - Program leaders position faculty to make programmatic decisions; distributed leadership - "We have this data that we are using all the time, every year and everybody is using it" (Program Administrator)
Outcomes: Outcomes of collective action made towards the object	- Holistic, program-wide assessment (PACT) facilitated a sense of shared responsibility across program members; "everybody feels not just the responsibility for the program, but for how their practice connects to everything else that's happening in the program" (Program Administrator) - PACT use has had widespread consequences, not only to program curriculum, but also to program culture and cohesion; "the power of having something like a program wide, authentic, performance assessment of teaching is ... certainly for us it's been one of the most critical factors in creating a more cohesive program, creating a more integrated university K-12 piece and in creating stronger faculty across the board, course instructors who know K-12 work, K-12 supervisors who are understanding more about the course work" (Program Administrator)

University of Cincinnati (UC) TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members as a collective	- Large program (100 faculty) - 6 licensure programs across 3 colleges - Most programs operate independently with regard to data use, but some efforts to share practices emerging
Object: The purpose of the work from the perspective of program members	- Program coordinator explicitly talked about "any kind of data collection, particularly edTPA, should be framed in terms of inquiry, program improvement, and moving our practice forward and putting an emphasis on the fact that it is a mandate is really counterproductive" - General agreement across informants about using data for program improvement (despite a fair amount of faculty resistance about particular data sources)
Tools: The conceptual and material tools that mediate data use practices and outcomes	- Piloting edTPA since 2009 (but not yet high stakes) (they were expecting scores to become public the next academic year) - Some state experimentation with VAM in early stages - New embedded signature assessments (required by UC system, to be used annually for data review and decision-making; designed internally by program faculty who designed them to support and align with edTPA) - Praxis II data used frequently in artifact describing data-based program changes (scores available publicly) - State TC satisfaction survey — data is public
Rules: The explicit and implicit norms and regulations that guide program practices	- "It's a wild time out there right now in Ohio"; lots of changes to policy/accountability landscape in OH, e.g., new Ohio Assessment for Educators (OAE) about to begin implementation at time of site visit; the two relevant state-level agencies (the Department of Education, which handles licensure, and the Board of Regents, which handles accreditation) were merging, creating uncertainty about issues such as state TPA policy - Some state experimentation with VAM - Internal changes, e.g., first program nationally certified by CAEP, underwent CAEP TI accreditation; moved from quarters to semesters previous year (requiring significant curriculum redesign) - Curriculum of four state-required teacher prep courses recently redesigned and aligned statewide (TAG courses) - Vertical alignment federal grant prompted widespread curriculum redesign/development, which fed into development of signature assessments - Limited faculty engagement ("don't see the data that often"), but clear expectations that they review the data at least annually, make decisions based on the data, and report those decisions for accreditation - Faculty given latitude/agency to make decisions about programs, curricula, and internal assessments

	- Very clear schedule of policies and procedures for data collection, analysis, and use through three improvement cycles (see schedule artifact) - Faculty "bombarded with requests and demands, really, to utilize and integrate data into our decision-making from multiple perspectives" (faculty)
Community: The characteristics, values, beliefs, and ideologies held by program members	- A fair amount of pushback and resistance to some data sources, especially the state survey and value added measures — leadership stresses that they must address the data even if they don't agree wholeheartedly because "rejecting the result out of hand is not an option that we have in the 21st century" (program director) - Also some resistance to assessments because of faculty concerns about teaching to the test - Faculty given latitude/agency to make decisions about programs, curricula, and internal assessments - Broad level of ownership to program accountability - Leadership takes accountability seriously but gives programs a fair amount of autonomy in decision making and action related to data use; "I am very cautious to listen as opposed to coming in and telling them that they have to do this" (program coordinator)
Division of Labor: Policies and practices related to the differentiation of programmatic roles and responsibilities	- Program faculty look at data reports (provided by assessment coordinator) at monthly program-specific meetings (where they are expected to look at the data before the meeting but don't necessarily directly discuss the data at the meeting) and annual program-specific data review and make program-specific data-based decisions about program changes that will address issues seen; they then report those decisions to the assessment coordinator for accreditation reporting - While data-based decision making happens primarily by each program independently, there have been some efforts to share strategies across programs, e.g. With academic language
Outcomes: Outcomes of collective action made towards the object	- College admins used Praxis II data to determine that a satellite campus's program was consistently underperforming and ultimately closed the program "even though it was making money" - Faculty engagement both widespread (it's required that they make data-based decisions) but also limited (often from compliance perspective) - Faculty engagement seems deeper with edTPA and their signature assessments, partly because many faculty and supervisors score and they use edTPA to inform design and use of signature assessments - Making several program changes to strengthen academic language, including revising the disciplinary literacy course, creating PD opportunities for faculty to facilitate addressing academic language in other courses, and creating signature assessments that address academic language; also program leader talked about one goal for summer being to share resources/expertise about academic language across programs to better align disciplinary literacy across those programs and "[pull] the best of our resources"

	- Secondary education program moving to full-year student teaching experiences, partly to better set up students for edTPA - See also artifact spelling out various evidence-based program changes

University of Louisiana at Lafayette (ULL) TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members as a collective	- 2nd largest university in Louisiana, serving approx. 18,000 students - COE prepares approximately 200 new teachers each semester, through traditional undergraduate programs, masters in teaching, and "alternative route" programs
Object: The purpose of the work from the perspective of program members	- Discussion of Passport (electronic data platform) revealed one major goal to gather data needed for accreditation - Clear that data use was, overall, aimed at program improvement
Tools: The conceptual and material tools that mediate data use practices and outcomes	- Value added (VA) data suggested there were several specific areas in which program outcomes were not as positive as had been previously believed - Early VA data as initially aggregated and reported to the state were not readily interpretable at the program level. Problem: "I understand there's a fire alarm going off… and we don't even know which building… much less which room" (Faculty). - Challenges with public perception and media coverage of VA data - New COMPASS system designed to make better connections btwn TPP evaluation & K-12 teacher eval - Passport electronic data platform
Rules: The explicit and implicit norms and regulations that guide program practices	- Strong accountability context; variety of state policy mandates aimed at monitoring, evaluating and improving the quality of the state's teachers - Underwent a state-mandated program re-design process in the early 2000's (like all TPPs in the state) w/ external review process that affirmed the quality of the program - Well developed meeting practices (time keeper, stay on track, goal to be efficient with one hour meetings and get a lot done in 1hr) - Grants supported state-level VA research & PD at ULL related to VA - Lead state VA researcher & staff now come to dean's meetings or periodic VA-specific meetings & "listen to the deans" - University VA research group meets once a month - Over time state VA researchers becoming much more responsive to state TEPs' needs - New data source (VA) sparking new "conversations" amongst faculty and administrators: "Access to different data sets brings about conversations…" (faculty) - Sustainability issues around getting useful drill-down data; grants supported that happening at first, but not clear whether/how that will be sustained
Community:	- Both the dean and faculty members commented during our site visit that the

The characteristics, values, beliefs, and ideologies held by program members	"culture" of the program reflected an historical commitment to systematic, data-based approaches to program improvement - Leadership, including University president, advocated at state level for improved/more useful value added data - Strong leadership at University president level and within COE - U president played key role in organizing meetings to respond to data with deans (COE & A&S), who then identified faculty to involve in collaborative data response effort - Belief in need for collaborative response: VA response initiated collaboration between COE & Arts & Sciences faculty - Collaboration, communication, and transparency were important themes that ran through faculty and administrators' talk - State Council of Deans collaborates in looking at and responding to VA data
Division of Labor: Policies and practices related to the differentiation of programmatic roles and responsibilities	- Faculty now going to trainings re: COMPASS system - U president organized deans, who then organized faculty, to respond to VA data and make program changes - VA steering committee faculty members review data and reach out to Arts & Sciences faculty about results and potential program changes (e.g. ELA ed faculty reaches out to English dept. Faculty and they collaborate) - Over time state VA researchers becoming more responsive to state TEPs' needs (e.g. Providing more useful drill-down data to programs) - Data access and transparency important in faculty's ability to respond to data; dean gives data to department heads who can share that with specific faculty or give to entire faculty; faculty can come and look at data sets - Change in personnel expectations (have to do whatever makes the program strongest, e.g. Get involved in field experiences)
Outcomes: Outcomes of collective action made towards the object	- Became more selective with admissions to their alternative route program (which had overall weaker VA scores) - Saw collaboration with Arts & Sciences in order to make curriculum changes related to NCATE & VA drill-down data (e.g. ELA, math) & making stronger connections btwn coursework and fieldwork (e.g. Science) - VA data source sparking new conversations and collaboration related to data-informed program improvement

University of Michigan (UM) TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members as a collective	- R1 context; consistently ranked as one of the top teacher education programs in the nation - Undergrad & graduate & TFA pathways (~300 undergrads, 170 grads) - Dept. has nearly 60 tenure-track faculty, approximately 30 research/clinical faculty and full time lecturers, and more than 35 temporary adjunct lecturers - Many differences between elementary and secondary certification programs; data collection focused primarily on elementary program
Object: The purpose of the work from the perspective of program members	- Overall change efforts (e.g., elementary program redesign) based on a general sense that existing program components were not adequately preparing teacher for modern challenges (e.g. Serving high needs schools, ELLs) - Emphasis on data use for program improvement
Tools: The conceptual and material tools that mediate data use practices and outcomes	- Internally-created performance assessments based on their conception of high-leverage practices - Video data frequently used (many discussed affordances of video data, but also issues with K-12 schools denying permission for TCs to videotape around students; TCs lacking the technological skills to capture, save, and upload high quality video samples of their instruction; and SOE faculty workload & time issues related to using video data ("I'm literally drowning in video") - Edthena used to house video data (issues with accessing previous year's data - only current data accessible to faculty) - The university is in the process of adopting a content management system called Foliotek & COE will be one of the units that pilots it and uses it (will hopefully be able to house more types of data together, e.g. Video data and demographic data etc) - Many faculty expressed frustration about lack of a data platform that can fit their needs and their high use of student records of practice (alongside other data) - State Dept. Of Ed survey (for exiting TCs and field instructors)
Rules: The explicit and implicit norms and regulations that guide program practices	- Very flexible state context - University supports for data-based innovation (e.g. grant funding) and "lack of roadblocks" - "Scoring parties" to score PAs - Elementary Curriculum Design Group (ECDG) meets every 3 weeks - dedicated time and space to collaborate with faculty and get the work done; often accompanied by food provided through a small grant; faculty report that instead of one more thing to try to squeeze into their busy schedules, they can count on the meeting times as productive spaces - Sustainability concern with official end of ECDG nearing: "the social

	structures have been a really important way in which we've been able to engender whatever happiness and engagement there is" (TEP director)
Community: The characteristics, values, beliefs, and ideologies held by program members	- ECDG faculty highly collaborative and appear to really value this collaboration - important aspect of program culture - Sense of collective expertise and respect for others' expertise among faculty - Dean's leadership important, including her support of data use work and advocacy of TE at state and national levels - Culture that honors distributed expertise; e.g. "I try really hard to foster a community in which people recognize that their strengths are being acknowledged and valued" (Elem. Program chair)
Division of Labor: Policies and practices related to the differentiation of programmatic roles and responsibilities	- Faculty highly engaged in data use practices, including the development, delivery, and analysis of their PAs - One barrier to faculty engagement is lack of alignment for some faculty between data-related work and the criteria upon which they are evaluated for promotion and tenure (depends on whether they can/want to make their research align with TE in a way that will be valued by people on tenure and promotion committee, which reportedly doesn't value TE work) - "Couldn't do [the work] if it wasn't shared… [the work] involves course instructors, program level administrator folks, field instructors, graduate students. So it is all hands on deck sort of effort" (Assessment coordinator) - Sustainability a frequently discussed concern, especially with regards to the significant amount of time required to collect, view, and provide feedback on student performance data, especially video data ("I'm literally drowning in video") - Faculty members provided with releases from their typical teaching loads to help build data use practices in recent years, but these releases won't continue indefinitely - Graduate students and field supervisors involved in data use work are reportedly working beyond their compensated hours - Concern that faculty turnover could negatively impact the work if future hires don't value the data use work
Outcomes: Outcomes of collective action made towards the object	- Many changes to program curriculum and assessments - Discussed issues of sustainability after ECDG group officially over; Director expects PAs and scoring parties will continue, but some practices may end when they're no longer meeting every 3 weeks. Also sustainability issues with data storage and retrieval of video data over 1 year old. - Ongoing issues with being "overwhelmed with [video] data" & workload issues related to time intensive video data

University of Tennessee, Chattanooga (UTC) TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members as a collective	- Have traditional undergraduate & graduate programs as well as 'transitional' licensure programs - Housed in the School of Education (SOE), 2nd largest department at UTC - About 325 graduates/yr - 37 faculty in SOE plus about 30 mostly part time clinical faculty/supervisors and cooperating teachers
Object: The purpose of the work from the perspective of program members	- Shifting from individual faculty data use (for individual purposes) to trying to use data for program improvement - "Our primary purpose [of data use] is for improvement" (Data coordinator) - Accountability emphasis strong
Tools: The conceptual and material tools that mediate data use practices and outcomes	- Value added (VA) data, student portfolios & key course assessments, dispositional data, PRAXIS data, fieldwork observation data, course evaluations, Degree+3 program data, edTPA, survey data, demographic data, TEAM data (based on state teacher evaluation system) - Very early stages of edTPA piloting; no data back yet - Issues with using state report card: "When [the legislature] mandated that we have a report card—that report card has changed a lot every year. It measures a little bit of different things every year, so it's really not comparable across the long haul, and they add more factors every year" (Dean). - Another program administrator called the report card data "useless" - Issues with VAM: data only available for some graduates/grades/subjects; disagreements and misunderstandings about which 'transitional licensure' students should be reported for VA data - Recently moved to an online platform for data organization & access, but it's not fully implemented yet as of site visit (SV) 1; not all program members have access yet - TEAM assessment connects data use in P-12 and at UTC - Relatively new Degree+3 program aims to train TCs to use classroom data for their own improvement; UTC faculty collect various data related to this program, including data about TCs performance for the first 3 years of teaching
Rules: The explicit and implicit norms and regulations that guide program	- NCATE & SACS (Southern Association of Colleges and Schools) accredited - State political climate identified as currently unsupportive of traditional TE (Dean) - VA requirements since early 2000s - EdTPA voluntary/no state mandate so far as of SV1

practices	- TPAC - have done initial training, sent some faculty and P-12 partners to be trained in edTPA. They were beginning the piloting process but hadn't fully implemented it yet. - State report card in place; changes slightly every year (see 'Tools') - Tennessee requires student evaluation instrument to mirror the state evaluation instrument (TEAM) - Data coordinator plays a big role in data use processes (e.g. Compiling data, sending it out to faculty, communicating about data use with faculty) - The assessment committee has representatives from all the different programs, meets 2-3 times/year (main collaborative structure for data use, particularly across programs) - "Siloing"/ "silofication" problem; lack of data use collaborations across programs: "We all have tons of [data] but it just sits there and it's in different places, which was part of our problem" (Faculty/Program administrator) - History of data use happening on an individual level not collaboratively; trying to change that; "That's our plan as we move forward, to have people to begin to think more programmatically" (Faculty/Program administrator) - Data use somewhat integrated into faculty annual evaluation process - Increased emphasis on research & scholarship in the last decade in terms of promotion and tenure; a lot of faculty looking to do action research using program data - SOE plays role in helping other departments with program review processes because of their expertise going through various accreditation processes
Community: The characteristics, values, beliefs, and ideologies held by program members	- Program leaders (dean, directors of SOE & teacher education) very committed to data use and data-based decision making - Program leaders spearheading data-informed program improvement agenda - Dean attributes general faculty attitudes consistent with data use and accountability to state and region's long history of measuring student performance and accountability pressures at K-12 level - "We like each other and I think we trust each other" (Director of SOE) - "It's a very cohesive department. They enjoy working with each other" (Dean) - Many faculty value action research using their own teaching and programs and drawing on related data - Data use and program values seem pretty well aligned—Using data for program improvement and for betterment of TCs & students
Division of Labor: Policies and practices related to the differentiation of programmatic	- Dean and SOE Director engage in state-level and legislative advocacy around data and accountability-related issues, including VA data & state report card issues - New data coordinator position - Data coordinator spent last 18 months trying to get data organized and accessible - Data coordinator plays a big role in data use processes (e.g. Compiling

roles and responsibilities	data, sending it out to faculty, communicating about data use with faculty) - Each program/team has their own data use practices - The assessment committee has representatives from all the different programs and they set up new norms so data-based decision making mostly happens through the committee and then goes back to programs (they meet 2-3 times/yr) - Much of the data work happens within programs (rather than across them) - Most data access via data coordinator (provides compilations of relevant data) or through individual data collection efforts
Outcomes: Outcomes of collective action made towards the object	- Created new parental involvement module curriculum & related assessment - Curriculum review and curriculum changes based on analysis of PRAXIS data & changes to PRAXIS - Creation/identification of some key assessments to collect data on within and across courses - At the beginning of the identified program-wide goal of moving from individual data use practices to more collaborative and programmatic data use goals and practices

University of Tennessee, Knoxville (UTK) TEP data use conditions and practices

CHAT component	Data use conditions and practices through an activity system lens
Subject: Program members as a collective	- Have traditional & 'transitional' licensure programs - Housed primarily in Department of Theory and Practice in Teacher Education (TPTE) - 31 full-time tenure track faculty, 9 full-time clinical faculty, and 32 graduate assistants - About 200 graduates/yr
Object: The purpose of the work from the perspective of program members	- Data use for program improvement - Agreement on wanting to serve TCs and P-12 students well - Accountability emphasis strong
Tools: The conceptual and material tools that mediate data use practices and outcomes	- Value added (VA) data, edTPA, TEAM data (based on state teacher evaluation system), action research project, PRAXIS data, survey data & course evaluations - Program members described edTPA data as more useful than VA data or survey data or student ; "the TPA is providing far more specificity [than our survey data] and it is driven by student performance" (Program Administrator) - EdTPA voluntary/no state mandate so far as of SV1: yr 1: 35 took edTPA; yr 2: 85 took edTPA; yr 3: 155 took edTPA (out of about 200 graduates/year) - Issues with VAM include data across programs; data only available for some graduates/grades/subjects; disagreements and misunderstandings about which 'transitional licensure' students should be reported for VA data - Starting some work to compare edTPA, TEAM data, and VA data - Some data access via Taskstream, but some faculty have issues accessing edTPA artifacts through there, especially if they are not listed as the student's advisor - TEAM assessment connects data use in P-12 and at UTK
Rules: The explicit and implicit norms and regulations that guide program practices	- NCATE accredited for a long time (>30 yrs) - VA requirements since early 2000s - EdTPA in state policy since 2013 (but they were early adopters) - Tennessee requires student evaluation instrument to mirror the state evaluation instrument (TEAM) - Relatively new TEAM evaluation for teachers very important for employment - Faculty are encouraged to attend informational edTPA meetings - EdTPA scored internally first 2 years then Pearson scored - Data coordinator plays a big role in data use processes (e.g. Compiling

	data, sending it out to faculty, communicating about data use with faculty) - The assessment committee has representation from all the different program areas. The goal of the assessment committee is "to enhance communication and help the faculty make data-driven decisions, to provide the mechanism for preparing for accreditation visits, and provide a means for us not just collecting data but to discuss them, to look at changes over time" (Director of student services). - Semi-annual meetings for other stakeholders to meet with assessment committee - Faculty agency in making data-based program decisions limited by bureaucracy: sometimes changes have "to be approved not only by the assessment committee but the University and the college departments and curriculum agencies. It does not have a lot to do with what a particular faculty member has to do, but with some things that are simple as the admission board process" (Program coordinator & faculty member) - Individual programs "are asked to identify program changes they're planning to make based on their data" (Program Administrator) - Sum of data use processes: "The data is broken down by program and then supplied to the individual program chairs, both broken down for their particular students and then also in the aggregate so they can see how their program compares with the results of the unit overall" (Data coordinator) - Each program/team has their own data use practices
Community: The characteristics, values, beliefs, and ideologies held by program members	- Program leader saw that joining edTPA would raise the national and state visibility of UTK & worked to join early implementation and get faculty and Board of Regents on board - Program leaders value data use for program improvement - Leadership proactive & not defensive about new data sources & mandates; "we can't be afraid of data"; "we can't just be defensive" (Director of SOE) - Leaders strategic about rolling out new data use measures and getting faculty buy-in (eg edTPA voluntary) - Data use and program values seem pretty well aligned—Using data for program improvement and for betterment of TCs & students
Division of Labor: Policies and practices related to the differentiation of programmatic roles and responsibilities	- Most data access via data coordinator (provides compilations of relevant data) - Data coordinator plays a big role in data use processes (e.g. Compiling data, sending it out to faculty, communicating about data use with faculty) - Assessment committee - Data coordinator has faculty rank, making it easier for him to communicate with faculty - Faculty and community and school leaders involved on the assessment committee - Program leaders communicate with state legislators and staff around VA data, advocating for more useful drill-down data

Outcomes: Outcomes of collective action made towards the object	- Most departments use edTPA now; not long before site visit the largest department had voted to mandate edTPA (this was before state mandated it) - "The TPA data stream has affected our program far more than the value-added data stream" (Program Administrator) - Courses were redesigned to fit the characteristics of the edTPA - edTPA data were used to analyze program effectiveness - Drastically reduced TCs' capstone action research projects due to increased efforts related to edTPA & TEAM - "EdTPA informs our program, it doesn't drive it" (Data coordinator) - Evidence that (some) faculty modify courses based on edTPA requirements - Data use differs between programs and faculty; appears to be fairly minimal program-oriented data use from faculty not on assessment committee - New forms of collaboration between faculty, supervisors & CTs due to edTPA & TEAM

Appendix C: Coding Structure for Dissertation Study (Used for Phase Two Analysis)

Motives

Individual motive/goal	Where people articulate an individual motive or goal related to the work of the program.
Collective motive/goal	Where people articulate a collective motive or goal related to the work of the program.
Mutual benefits	Expressing and/or understanding that there are mutual benefits to collaboration/joint work. Also a way of talking about object(s), including shared object(s).

Interpersonal resources

Relational agency	A capacity that is exercised in moments of joint work that aims to sustain productive joint engagement in work tasks to enhance their own response. A joint and more powerful form of agency. Intentional work on jointly expanding object of activity.
Relational expertise	Working resourcefully with others on task accomplishment. Recognizing what matters to others and aligning motives so that joint engagement continues. Knowing how to know who (and also tools).
Common knowledge	A resource for mobilizing knowledge across practice boundaries. CK is based on shared understandings of practitioner's motives and intentions. CK generated at intersecting practices in talk about potentially shared objects of activity where purposes and intentions are made explicit. Parallel processes of personal sensemaking and public meaning making.
Leadership	Where leaders encourage professionals' personal agency and align professional motives with a strategic, object-oriented agenda. Drawing on Edwards's conception of leadership.
Organizational narratives	ONs weave together motives and priorities of both the professionals involved and the organization(s). ONs reify motives and shared purposes and give direction to the change process. ONs are tools that provide clarity to the common, overarching purpose of the work as well as a framework within which to assess current and future practices.
Trust	Trust in other person(s), group(s), the program, or entities outside the program. Trust in the person(s)/entities themselves, their motives, and/or their expertise.
Respect	Respecting other person(s), group(s), the program, or entities outside the program. Respecting the person(s)/entities themselves, their motives, and/or their expertise.

Listening	Evidence of person(s) listening to others and their ideas and/or motives, whether they agree with them or not.

Organizational resources

Social/ collaborative resources	Structures, norms, policies, and resources that enable or constrain collaboration and joint work. E.g., meetings.
Organizational resources	Fiscal, human, and operational resources related to data use or collaboration.
Division of labor/ personnel	Policies and practices related to separation of duties, access to practices and tools. Program policies and practices related to staffing, job descriptions, and job expectations.

Outcomes

Shared responsibility	Expressing and/or understanding that the responsibility of improving the program or reaching a collective object is a shared responsibility amongst program members and potentially others. Also a way of talking about object(s), including shared object(s).
Distributed expertise	Knowledge of how to do things is shared across program participants, rather than concentrated in one or a few individuals; acknowledgement of different kinds of expertise coming to the table.
Program changes	Outcomes directly related to data-related joint work, including new or evolving practices and tools, and changes to program structure, curricula, pedagogy, or policies.
Collaboration as outcome	Evidence of changed, increased, or evolved collaboration as a result of data-related work in the program. Includes changes to program structure, culture, policies, or practices that enable or constrain collaboration.
Coherence	Evidence of increased or evolved programmatic coherence OR people articulating a goal of increased programmatic coherence. Alternately, people talking about the opposite of coherence – programmatic fragmentation.

Other/misc

Joint work/ collaboration	Descriptions of formal or informal joint activity: two or more individuals intentionally aligning their work around the same goal.
Juicy quotes	Evidence that shows or demonstrates an important idea. Also pithy and important statements.

Appendix D: Collaborative Structures at ECU

Collaborative Structure	Participants	Additional Information
Council for Teacher Education (CTE)	Led by Director of Teacher Education and includes representatives from all programs	Met monthly to share news, resources, and ideas.
Committee for Assessment and Accreditation	Administrators and staff primarily associated with the Office of Assessment and Accreditation	Met monthly; frequently presented data and research briefs related to different projects going on in ECU's TEPs to various stakeholders; has a subcommittee that gets feedback from faculty "on the types of things that they want to ask and need to ask for their individual programs" (Program Administrator).
Data Summits	All faculty, supervisors, administrators, and some staff	Planned periodically to report on and evaluate progress on college pilot studies, and to present and interpret various program comparison reports (some based on local data, others grounded in state or national databases).
Faculty Meetings	Faculty from each TEP	Majority of the 17 programs held faculty meetings once a month. Faculty meetings were not a new collaborative resource at ECU, though many faculty members spoke about a shift in the content of some faculty meetings as they began to integrate data use projects and data use activities into the existing structure of the meetings.
Research Communities of Practice (RCoPs)	Self-selected groups of faculty based either on participation in a particular program innovation (e.g., ISLES, edTPA) or faculty interests	Each RCoP had its own meeting schedule. Groups were designed to foster "research wrapped around [their] teaching and [their] programming" (Dean) and contribute to program improvement.
Course-alike groups	Faculty who taught similar courses within and across different TEPs	Groups became a "structure for change" in the curriculum, and some created common assessments so they had new data sources that spanned across programs.
Work groups	Faculty	There were 'work groups' associated with each Pirate Code innovation; each

		group had its own regular meeting schedule (e.g., edTPA group met monthly).
Pods	Supervisors	Pods were designed to foster better communication and support with supervisors. Supervisors were grouped in pods by discipline areas. Each pod had a designated leader.
Conferences	Faculty and administrators	Increased conference attendance and participation supported through various policies and incentives. There were many examples of faculty individually and (more often) collaboratively developing conference proposals and presentations using program data. In some cases, faculty collaborated with people from other universities on conference proceedings.

Appendix E: Example Pirate Code Project Implementation Timelines at ECU

ECU *edTPA* implementation timeline:

TQP/Pirate CODE Project Implementation Timeline

Teacher Education Program	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
	201180	201180	201230	201330	201330	201380	201430	201480	201530	201580	201630
Art Education											
Business Education											
Birth thru Kindergarten Education											
Dance Education											
Elementary Education											
English Education											
Family and Consumer Sciences Education											
Foreign Languages Education											
History/Social Studies Education											
School Health Education											
Physical Education											
Mathematics Education											
Middle Grades Education											
Music Education											
Science Education											
Special Education											
Theatre Education											

Implementation Timeline Codes

	Original Language	Current Language
	Not Involved	
	Problem Analysis	Squishy Pilot
	Prototype Design	Formal Pilot
	Field Test and Iterative Refinement	Refinement & Expansion
	Summative Evaluation	Scale Up
	Component Adoption with Evaluation Monitoring	Impact and Reflective Studies

ECU *co-teaching* implementation timeline:

TQP/Pirate CODE Project Implementation Timeline

Teacher Education Program	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
	201180	201180	201230	201330	201330	201380	201430	201480	201530	201580	201630
Art Education											
Business Education											
Birth thru Kindergarten Education											
Dance Education											
Elementary Education											
English Education											
Family and Consumer Sciences Education											
Foreign Languages Education											
History/Social Studies Education											
School Health Education											
Physical Education											
Mathematics Education											
Middle Grades Education											
Music Education											
Science Education											
Special Education											
Theatre Education											

Implementation Timeline Codes

	Original Language	Current Language
	Not Involved	
	Problem Analysis	Squishy Pilot
	Prototype Design	Formal Pilot
	Field Test and Iterative Refinement	Refinement & Expansion
	Summative Evaluation	Scale Up
	Component Adoption with Evaluation Monitoring	Impact and Reflective Studies

ECU *instructional coaching* implementation timeline:

TQP/Pirate CODE Project Implementation Timeline

Teacher Education Program	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
	201030	201180	201180	201230	201330	201330	201380	201430	201480	201530	201580	201630
Art Education												
Business Education												
Birth thru Kindergarten Education												
Dance Education												
Elementary Education												
English Education												
Family and Consumer Sciences Education												
Foreign Languages Education												
History/Social Studies Education												
School Health Education												
Physical Education												
Mathematics Education												
Middle Grades Education												
Music Education												
Science Education												
Special Education												
Theatre Education												

ECU *ISLES curriculum* implementation timeline:

TQP/Pirate CODE Project Implementation Timeline

Teacher Education Program	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
	201180	201180	201230	201330	201330	201380	201430	201480	201530	201580	201630
Art Education											
Business Education											
Birth thru Kindergarten Education											
Dance Education											
Elementary Education											
English Education											
Family and Consumer Sciences Education											
Foreign Languages Education											
History/Social Studies Education											
School Health Education											
Physical Education											
Mathematics Education											
Middle Grades Education											
Music Education											
Science Education											
Special Education											
Theatre Education											

Implementation Timeline Codes

	Original Language	Current Language
	Not Involved	
	Problem Analysis	Squishy Pilot
	Prototype Design	Formal Pilot
	Field Test and Iterative Refinement	Refinement & Expansion
	Summative Evaluation	Scale Up
	Component Adoption with Evaluation Monitoring	Impact and Reflective Studies

ECU *video grand rounds (VGR)* implementation timeline:

TQP/Pirate CODE Project Implementation Timeline

Teacher Education Program	Spring 2012	Summer 2012	Fall 2013	Spring 2013	Summer 2013	Fall 2013	Spring 2014	Summer 2014	Fall 2014	Spring 2015	Summer 2015	Fall 2015	Spring 2016
	201230	201230	201330	201330		201380	201430		201480	201530		201580	201630
Art Education													
Business Education													
Birth thru Kindergarten Education													
Dance Education													
Elementary Education													
English Education													
Family and Consumer Sciences Education													
Foreign Languages Education													
History/ Social Studies Education													
School Health Education													
Physical Education													
Mathematics Education													
Middle Grades Education													
Music Education													
Science Education													
Special Education													
Theatre Education													

Implementation Timeline Codes

	Original Language	Current Language
	Not Involved	
	Problem Analysis	Squishy Pilot
	Prototype Design	Formal Pilot
	Field Test and Iterative Refinement	Refinement & Expansion
	Summative Evaluation	Scale Up
	Component Adoption with Evaluation Monitoring	Impact and Reflective Studies

ECU *professional development for clinical partners* implementation timeline:

TQP/Pirate CODE Project Implementation Timeline

Teacher Education Program	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
	201180	201180	201230	201330	201330	201380	201430	201480	201530	201580	201630
Art Education											
Business Education											
Birth thru Kindergarten Education											
Dance Education											
Elementary Education											
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Foreign Languages Education											
History/Social Studies Education											
School Health Education											
Physical Education											
Mathematics Education											
Middle Grades Education											
Music Education											
Science Education											
Special Education											
Theatre Education											

Implementation Timeline Codes

	Original Language	Current Language
	Not Involved	
	Problem Analysis	Squishy Pilot
	Prototype Design	Formal Pilot
	Field Test and Iterative Refinement	Refinement & Expansion
	Summative Evaluation	Scale Up
	Component Adoption with Evaluation Monitoring	Impact and Reflective Studies